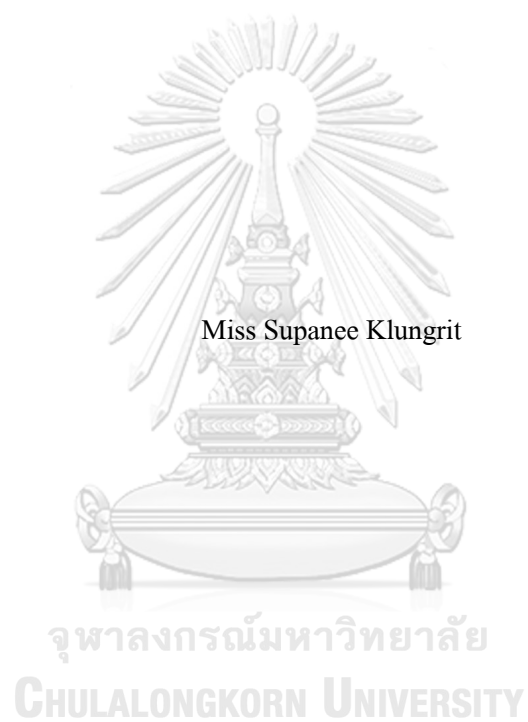


THE DEVELOPMENT OF SUPPORTIVE CARE NEEDS SCALE FOR THAI WOMEN WITH  
BREAST CANCER UNDERGOING CHEMOTHERAPY



A Dissertation Submitted in Partial Fulfillment of the Requirements  
for the Degree of Doctor of Philosophy in Nursing Science

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การพัฒนาเครื่องมือแบบประเมินความต้องการการดูแลสนับสนุนของหญิงไทยที่เป็นมะเร็งเต้านม  
ขณะรับการรักษาเคมีบำบัด



วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาพยาบาลศาสตรดุษฎีบัณฑิต  
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สุภาณี คลังฤทธิ์ : การพัฒนาเครื่องมือแบบประเมินความต้องการการดูแลสนับสนุนของหญิงไทยที่เป็นมะเร็งเต้านมจะได้รับการรักษาเคมีบำบัด. ( THE DEVELOPMENT OF SUPPORTIVE CARE NEEDS SCALE FOR THAI WOMEN WITH BREAST CANCER UNDERGOING CHEMOTHERAPY) อ.ที่ปรึกษาหลัก : รศ. ดร.สุรีพร ธนศิลป์, อ.ที่ปรึกษาร่วม : ผศ. ดร.ชนกพร จิตปัญญา

การประเมินถึงความต้องการการดูแลสนับสนุนก่อนการวางแผนการพยาบาลเป็นบทบาทสำคัญในการดูแลที่เน้นผู้ป่วยเป็นศูนย์กลาง ทั้งนี้ความต้องการการดูแลสนับสนุนของกลุ่มผู้หญิงไทยที่เป็นมะเร็งเต้านมจะได้รับการรักษาเคมีบำบัดที่มีกระบวนการรักษาที่มีความเฉพาะเจาะจงแตกต่างจากกลุ่มผู้ป่วยมะเร็งอื่นๆ โดยพบว่าแบบประเมินความต้องการการดูแลสนับสนุนสำหรับผู้ป่วยมะเร็งที่ถูกสร้างขึ้นจากประเทศทางตะวันตกยังมีข้อจำกัดของข้อคำถามบางประเด็นที่เกี่ยวข้องกับบริบท วิธีการดำเนินชีวิตและวัฒนธรรมที่ต่างกันที่ไม่สามารถประเมินได้ตรงกับความต้องการทั้งหมดในบริบทของคนไทย

การศึกษานี้มีวัตถุประสงค์เพื่อพัฒนาแบบประเมินความต้องการการดูแลสนับสนุนสำหรับหญิงไทยที่เป็นมะเร็งเต้านมจะได้รับการรักษาเคมีบำบัด ด้วยกระบวนการพัฒนาเครื่องมือ 2 ระยะ คือ ระยะที่ 1 การสร้างเครื่องมือ ด้วยการกำหนดคำนิยาม และลักษณะของความต้องการการดูแลสนับสนุนจากการสัมภาษณ์ผู้หญิงไทยที่เป็นมะเร็งเต้านมจะได้รับการรักษาเคมีบำบัด จำนวน 10 คน วิเคราะห์ข้อมูลเพื่อใช้เป็นกรอบในการพัฒนาชุดข้อคำถามจำนวน 62 ข้อ ทำการตรวจสอบความตรงตามเนื้อหาจากผู้ทรงคุณวุฒิ 7 คน พบค่าความตรงตามเนื้อหาเฉลี่ยเท่ากับ 0.91 ปรับแก้ไขข้อคำถามเหลือ 55 ข้อ นำไปทดลองกับกลุ่มตัวอย่างจำนวน 30 คน คำนวณค่าสัมประสิทธิ์อัลฟาของครอนบาคเท่ากับ 0.886 ในระยะที่ 2 การทดสอบคุณภาพของเครื่องมือ ด้วยการนำเครื่องมือที่สร้างขึ้นไปทดสอบคุณสมบัติทางจิตมิติด้วยการวิเคราะห์องค์ประกอบเชิงสำรวจกับกลุ่มตัวอย่างจำนวน 350 คน และการวิเคราะห์องค์ประกอบเชิงยืนยันกับกลุ่มตัวอย่างจำนวน 352 คน หน่วยศดึกภูมิขั้นสูงด้านมะเร็ง จำนวน 8 แห่ง ครอบคลุม 4 ภาคของประเทศไทย ทั้งนี้เพื่อประเมินความตรงเชิงโครงสร้างและความน่าเชื่อถือของเครื่องมือ

ผลการวิเคราะห์องค์ประกอบเชิงสำรวจด้วยวิธีองค์ประกอบร่วม หมุนแกนด้วยวิธี Varimax กำหนดคะแนนองค์ประกอบร่วม 0.3 ได้แบบประเมินฉบับสุดท้ายที่พัฒนาขึ้น จำนวน 43 ข้อ ประกอบด้วย 8 องค์ประกอบที่สามารถอธิบายความผันแปรของข้อมูลได้ร้อยละ 69.66 ได้แก่ 1) การสนับสนุนทางการเงิน (6 ข้อ) 2) คำแนะนำการดูแลตนเอง (5 ข้อ) 3) การสนับสนุนจากครอบครัว (7 ข้อ) 4) การตระหนักเกี่ยวกับโรคและการรักษา (7 ข้อ) 5) การมีส่วนร่วมของครอบครัว (5 ข้อ) 6) การปรึกษาผู้เชี่ยวชาญ (4 ข้อ) 7) ข้อมูลการดูแลทางเลือก (3 ข้อ) และ 8) การดูแลและบรรเทาอาการ (6 ข้อ) ซึ่งเป็นแบบประเมินมาตราวัดประมาณค่า 4 ตัวเลือก (1-4) ที่ประเมินถึงความสำคัญและเป็นของความต้องการการดูแลสนับสนุนแต่ละข้อในระดับน้อยที่สุด-น้อย-มาก-มากที่สุด

ผลการวิเคราะห์องค์ประกอบเชิงยืนยัน โดยพิจารณา Chi-Square = 862.74, df = 591, P-value = 0.000, RMSEA = 0.036, SRMR = 0.060, CFI = 0.941, GFI = 0.902 ผลการตัดสินแสดงให้เห็นว่าข้อมูลเชิงประจักษ์มีความสอดคล้องแบบสถิติกับผลการวิเคราะห์องค์ประกอบเชิงสำรวจ ค่าความคลาดเคลื่อนของแบบประเมินอยู่ในเกณฑ์มาตรฐาน รวมทั้งค่าความเชื่อมั่นของเครื่องมือภายหลังการวิเคราะห์รายด้านอยู่ระหว่าง 0.705 - 0.817 และค่าความเชื่อมั่นรายฉบับเท่ากับ 0.941

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ลายมือชื่อนิติ .....  
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ลายมือชื่อ อ.ที่ปรึกษาร่วม .....

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KEYWORD: SUPPORTIVE CARE NEEDS, BREAST CANCER, INSTRUMENT DEVELOPMENT

Supanee Klungrit : THE DEVELOPMENT OF SUPPORTIVE CARE NEEDS SCALE FOR THAI WOMEN WITH BREAST CANCER UNDERGOING CHEMOTHERAPY. Advisor: Assoc. Prof. SUREEPORN THANASILP, Ph.D. Co-advisor: Asst. Prof. CHANOKPORN JITPANYA, Ph.D.

Assessment of supportive care needs before setting up care plans plays significant role in conducting patient-centered care, particularly supportive care needs of Thai women with breast cancer undergoing chemotherapy whose treatment process is specifically different from other group of cancer patients. It was found that supportive care needs scales constructed in western countries had certain limitations of some question items concerning difference in context, ways of life, and culture. Hence they could not assess consistently with all needs of Thai context.

This study aims to develop supportive care needs scale for Thai women with breast cancer undergoing chemotherapy with two stage instrumental development process. In Stage I, the scale was constructed by determining operational definition and attributes of supportive care needs by interviewing 10 Thai women with breast cancer undergoing chemotherapy. Data were analyzed to provide a framework for development of 62 question items. Content validity was checked by seven experts and was found to have content validity by version of 0.91. Questions were edited and the remaining 55 items were tried out with 30 samples. Cronbach's Alpha was found to be 0.886. In Stage II, the instrument's quality was examined. Psychometric properties of the proposed scale was tested by Exploratory Factor Analysis with 350 samples and Confirmatory Factor Analysis with 352 samples at eight super tertiary cancer care units, from all four regions of Thailand, in order to assess construct validity and reliability of the instrument.

Results of the Exploratory Factor Analysis using common factor method which was a Principle Components Analysis (PCA) and Varimax with Kaiser Normalization method determined value of factor loading at 0.3. The resulting final version of the questionnaire had 43 items in eight components that could explain data variation at 69.66 percent of cumulative. These components were: 1) financial support (6 items), 2) self-care advice (5 items), 3) family support (7 items), 4) awareness of disease and treatment (7 items), 5) family involvement activities (5 items), 6) consult with professional (4 items), 7) information on complementary care (3 items), and 8) symptomatic relieving and care concern (6 items). The questionnaire used four-point rating scale (1-4) to assess level of importance and necessity of each supportive care need from the lowest, low, high, to the highest.

Results of Confirmatory Factor Analysis showed Chi-Square = 862.74, df = 591, p-value = 0.000, RMSEA = 0.036, SRMR = 0.060, CFI = 0.941, and GFI = 0.902. Results indicated that empirical data were closely consistent with results of Exploratory Factor Analysis. Errors of the questionnaire were in standard level, reliability after by-aspect analysis was between 0.705 - 0.817, and reliability by version was 0.941.

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Supanee Klungrit

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# CHAPTER I

## INTRODUCTION

### **Background and significance of the study**

Breast cancer is one of the scariest silent cancer threat in Thai women that threatens all aspects of life: body, mind, social life and even soul. Impact of breast cancer starts from the day of diagnosis throughout all stages of treatment during disease progression (Akechi et al., 2011; Arman, Rehnsfeldt, Lindholm, & Hamrin, 2002; Burgess et al., 2005; Koçan and Gürsoy, 2016). Particularly, 98.2 percent of women with breast cancer needs chemotherapy treatment (Kotepui and Chupeerach, 2013) that consumes a long period of time. These women have to spend years facing problems and changes, both physical changes from breast cancer disease and complications from chemotherapy (Brant et al., 2011; Spichiger et al., 2011; Yamagishi, Morita, Miyashita, & Kimura, 2009), as well as from increased tension and agony (Akechi et al., 2011; Suwankhong and Liamputtong, 2018; Thompson et al., 2013). Limitations in daily living and socializing (Lai, Ching, & Wong, 2017) all add up to radical changes that cause imbalance in life. It also leads to needs for necessary supports from family and health care team in order to endure those changes, live peacefully with their sickness and treatment, and maintain a good quality of life (Fitch, Porter, & Page, 2008; Lai et al., 2017).

Supportive Care Needs (SCNs) is an important concept that most nursing researchers pay attention to in many aspects, especially in cancer patients. The concept of SCNs was initiated by Fitch et al. (2008) who had founded a Supportive

Care Framework (SCF) for use as a model in supporting and taking care of cancer patients in Canada. SCNs as defined from a viewpoint of health care provider refers to issues of desire which occur in cancer patients and lead to needs for necessary supportive care from others: family, friend, colleague and health care team, in order to help them live with their cancer sickness with good quality of life. These include six aspects of needs: physical, emotional, psychosocial, spiritual, practical, and informational which corresponds with and covers holistic care as viewed by nursing profession (Fitch et al., 2008).

Nevertheless, SCNs of cancer patients are individual needs that could change and reoccur all the time (Fitch et al., 2008; Harrison, Young, Price, Butow, & Solomon, 2009; Smith, Hyde, & Stanford, 2014). Although among patients who are diagnosed with the same type of cancer and receive the same kind of chemotherapy, there are differences in severity of disease and formula of prescribed chemotherapy (Fischer, Dolbeault, Sultan, & Brédart, 2014). In addition, differences in context and culture also influence different needs for supportive care (Fischer et al., 2014; Lam et al., 2011). Thus, attempt to access a true SCNs of patients is a significant strategy of Patient-Centered Care. The health care team should try to improve and search for assessment method of patients' needs that covers both formal assessment and purposive assessment (McDowell, Occhipinti, Ferguson, Dunn, & Chambers, 2010; Moghaddam, Coxon, Nabarro, Hardy, & Cox, 2016) in order to acquire information of true needs directly from patients' viewpoint (Markee, 2013).

From all mentioned above, Thai women with breast cancer undergoing chemotherapy is a kind of cancer patient whose occurrence of the disease is in the top rank of nearly every country around the world, compared to all kinds of cancer

occurred in women. The pathology process of nearly all kinds of cancer may have similar characteristics, main mechanism, and major treatment approach - operation, chemotherapy and radiation treatment. However, specificity of location of the disease, severity of the disease, perfect physical condition of the patient, as well as procedures and details of the treatment (Khatcheressian et al., 2012) affect changes to the body of each patient differently. Moreover, differences in occurrence of problems, severity of problems, how to deal with problems, and needs for assistance and support are all important fundamental information needed to be assessed before preparing nursing care plan to take care of, help and support the patient correctly and appropriately. It could be said that SCNs assessment from women with breast cancer undergoing chemotherapy is very important for nurses to search for, in order to understand real needs of patients before providing appropriate supportive care (Abdulla Karim, Ahmed, Mahvash, & Salsali, 2016; Brédart et al., 2013; Harrison et al., 2009).

Review of existing literature shows that there were several development of SCNs assessment surveys designed from viewpoints of nursing professionals which were used with all types of cancer patients. It was also found that these Supportive Care Needs Surveys (SCNS) (McElduff, Boyes, Alison, & Girgis, 2004; Richardson, Medina, Brown, & Sitzia, 2007; Richardson, Sitzia, Brown, Medina, & Richardson, 2005) – both the long 59-item version (SCNS-LF59) (Bonevski et al., 2000; McElduff, Boyes, Alison, et al., 2004) and the short 34-item version (SCNS-SF34) – had been used in many countries: Japan, China, Turkey, and French (Au et al., 2011; Baudry, Anot, Bonnetain, Mariette, & Christophe, 2019; Boyes, Girgis, & Lecathelinais, 2009; Bredart et al., 2012; Garvey et al., 2012; Girgis, Stojanovski, Boyes, King, & Lecathelinais, 2012; Okuyama et al., 2009; Ozbayır, Geçkil, & Aslan,

2017). These are the most popularly used SCNs assessment surveys with quite high level of reliability.

Both the long (SCNS-LF59) and the short (SCNS-SF34) versions of SCNS had been designed and developed on issues that all cancer patients might encounter throughout the period of sickness and treatment; namely, pain, fatigue, anxiety, sorrow, fear for expansion of cancer, worrisome for uncertainty of the future, changes in sexual feelings, and needs about symptoms and treatment, such as information about results of diagnosis and treatment, access to consulting with specialized counsellors, and information about things to do to make them feel better (Bonevski et al., 2000; McElduff, Boyes, Alison, et al., 2004). These issues were transforms into questions with self-administered instrument design according to patients' perceptions of level of SCNs for the issues they faced during the past month. Needs for supportive care were divided into five levels: (1) not needed because it is not a problem resulting from getting cancer; (2) not needed because they are satisfied with gained support; (3) slightly needed because the problem needs little support; (4) moderately needed; and (5) much needed (McElduff, Boyes, Alison, et al., 2004; Richardson et al., 2005).

It could be seen that assessment with both the long (SCNS-LF59) and the short (SCNS-SF34) versions of SCNS focuses on major problems that cover SCNs occurred with nearly all types of cancer patients. However, it still lacks certain details specific to problems occurred with breast cancer only, for example, problems with an arm on the operated side, appearance, and loss of femininity (Burgess et al., 2005; Koçan and Gürsoy, 2016), including several problems occurred from impacts of undergoing chemotherapy as Out-Patient Department (OPD), in which most problems occurred at home after receiving chemotherapy (Klungrit, Thanasilp, & Jitpanya,



2019). Differences of these specific problems could also affect major problems as well. Hence, it is important that these specific hidden problems must be searched for to provide information for health care team. So, they could prepare a problem-solving plan that corresponds with real SCNs of the patients. This is the most important point of patient-centered care and humanized health care.

At present, these SCNs assessment surveys have been translated from English and used widely with cancer patients in many countries. However, as mentioned earlier that women with breast cancer undergoing chemotherapy are very specific group whose sickness occurs with the significant womanliness organ. Moreover, chemotherapy treatment process and self-care behavior during therapy are quite complicated and different from other types of cancer (Lai et al., 2017; Suwankhong and Liamputtong, 2018; Wannapornsiri, 2003). In addition, a unique Thai “considerate” characteristic also makes Thais’ daily living, viewpoint, attitude, belief and needs different from western countries (Fitch et al., 2008; Suwankhong and Liamputtong, 2018; Wannapornsiri, 2003). There might be limitations in using SCNS scale for cancer patients to assess SCNs of Thai women with breast cancer undergoing chemotherapy.

Additionally, the above literature review also shows that researches into SCNs of cancer patients concern mainly with discovery of issues occurred with cancer patients and led to different level of SCNs. However, SCNs perceived directly by patients do not covers only problems but also desires for things to relieve and handle those problems. Nurses are main staff of health care team whose direct duty deals with supportive care for patients with breast cancer undergoing chemotherapy, in cooperation with other staff in the team. Therefore, if nurses could assess patients’

SCNs precisely, health care team will know the true nature of problems and SCNs of their patients.

Nevertheless, the aforementioned information reveals that the currently used SCNs assessment instrument does not truly reflect structure or components of SCNs perceived directly by patients, particularly Thai women with breast cancer undergoing chemotherapy. Thus, it is crucial that an instrument for SCNs assessment that truly reflects structure or components of the needs should be developed for nurses to use to correctly assess SCNs of Thai women with breast cancer undergoing chemotherapy.

### **Research questions**

1. What dimensions of SCNs should be included in a scale for Thai women with breast cancer undergoing chemotherapy?
2. What are the psychometric properties of the proposed assessment tool for SCNs of Thai women with breast cancer undergoing chemotherapy?

### **Objectives of the study**

The objective of this study is to develop an instrument and test for psychometric properties of the proposed assessment tool for SCNs of Thai women with breast cancer undergoing chemotherapy.

## Conceptual framework

The individualistic views (Simmel, 2007; Smith and Moore, 2015; Soares, 2018) and emic view (Markee, 2013) about Supportive Care Needs (SCNs) of Thai women with breast cancer undergoing chemotherapy was used as a framework of this study. From a sociological viewpoint, the meaning of “*an individual*” concerns with being, sensibility or ambition, and aspirations (Simmel, 2007; Smith and Moore, 2015; Soares, 2018). Hence, each human being’s uniqueness depends on personal experiences and inner centeredness. These indicate that an individual comprises of processes that make a person develops his or her own specific uniqueness which differentiates him or her from others. Thus, individual differences are important and necessary for understanding of the whole person (Simmel, 2007).

SCNs can be defined as a multidimensional concept, which is an important concept defined by Fitch et al. (2008) who set up a Supportive Care Framework (SCF) for treatment of cancer patients in Canada. Definition of SCNs concerns with various issues or problems that cancer patients faced from the initial diagnosis of cancer throughout various stages of treatment. These SCNs include six areas of needs; physical need, emotional need, psychosocial need, spiritual need, practical need, and informational need – which correspond and cover the holistic care viewpoint of nursing profession (Fitch et al., 2008).

However, “*needs*” in health care viewpoint are individual uniqueness with various definition and can always change. So, it is common that health professions would assess needs with varied approach (Asadi-Lari, Packham, & Gray, 2003; Culyer, 1998) to find answers for real needs of patients. Although overall problems of

cancer patients are similar, differences in personal factors, experience, belief, context and culture will influence differences in needs of each individual (Asadi-Lari et al., 2003). Moreover, language used to describe needs is also subjectively-perceived because, from patient's point of view, "*supportive care needs (SCNs)*" may not only refer to major issues or problems needed to be solved, but also include identification of needed items or wish to receive supportive care. Findings from literature review indicate and promote uniqueness of individuality. Hence, a definition of "*supportive care needs (SCNs)*" should directly address needs from patients' viewpoint as an emic view (Markee, 2013). Therefore, the individualistic viewpoint of SCNs and its attributes were examined based on perception of Thai women with breast cancer who were undergoing chemotherapy.

The development of Supportive Care Needs Scale for Thai women with breast cancer undergoing chemotherapy (SCNS-TBC) under individualistic viewpoint should be useful for both Thai women with breast cancer and health care providers in providing true understanding of SCNs, in order to layout suitable supportive care plan for patients' real needs.

### **Scope of the study**

This instrumental development study was conducted under the framework of Devellis (2012, 2016) with an aim to develop SCNS-TBC using qualitative method of face-to-face in-depth interview. The tool's psychometric properties were tested by quantitative method with a sample group of Thai women with breast cancer who had direct experience of chemotherapy at super tertiary cancer care hospitals in Thailand.

## **Operational definition**

The main concept in this study is Supportive Care Needs (SCNs) for Thai women with breast cancer undergoing chemotherapy, based on the existing body of knowledge about the concept of SCNs initiated by Fitch et al. (2008) who had founded a Supportive Care Framework (SCF) for cancer patients in Canada. Thus, in this study, the theoretical operational definition of SCNs was specified as a basis for understanding about SCNs of Thai women with breast cancer undergoing chemotherapy as follows:

### ***The operational definition of Supportive Care Needs (SCNs)***

**Supportive Care Needs** refer to issues of desire that lead to need and necessity to get assistance from others – family, friend, colleague and health care team – to help patients live with their cancer illness with good life quality. Supportive care needs cover six domains of the following needs; 1) Physical, 2) Emotional, 3) Psychological, 4) Spiritual, 5) Practical, and 6) Informational needs (Fitch et al., 2008) as follows:

1. **Physical need** refers to need for comfort, painlessness, good nutrition, free of malnutrition, and ability to carry on daily activities. These needs relate with various syndromes, such as pain, fatigue, tiredness, nausea, anorexia, weight loss, hair fall, abnormality in swallowing and speaking, and change in sexual relationship.

2. **Emotional need** refers to need for peace of mind, relationship with others, emotional stability, and confidence. These needs relate with various feelings, such as

fear, depression, anxiety, strain, anger, guilt, burden for others, hopelessness, discouragement, and separation from society.

3. **Psychosocial need** refer to need for ability to adjust oneself to illness and treatment, self-control, positive thinking, and self-confidence. These needs relate with issues like changes in ways of living, sexual relationship problems, critical thinking ability, changes in appearance, and fear for recurrence of illness. It also includes relationship with lovers, relationship within family, and social acceptance. These needs relate with changes in role and duty, response to problem solving, relationship within society, and communication in society.

4. **Spiritual need** refers to need for meaning and goal of life. These needs relate with issues like religious belief, feeling of self-value, steadfastness and purposefulness, and encountering with hopelessness.

5. **Practical need** refers to need for direct help to accomplish daily activities. These needs relate with various activities, such as food preparation, housework, commutation to various places and to get treatment, care for grandchildren, economic condition, rights and other related laws.

6. **Informational need** refers to need for information to help reduce anxiety, confusion, and fear, information to help in decision-making of patients and families, and useful information for promoting patients' skills. These informational needs relate with issues like treatment practice and side effects, solving of several problems, care process, communication with patients and caretakers, and suitable sources of information.

### **Expected benefits**

The proposed tool will be very useful for nurses and other related staff for correct assessment of real SCNs of Thai women with breast cancer undergoing chemotherapy. The main result of this study is a Supportive Care Needs Scale for Thai women with breast cancer undergoing chemotherapy (SCNS-TBC) which is an important instrument developed to search for problems and to understand supportive care needs (SCNs) of Thai women with breast cancer undergoing chemotherapy. This is a group of population that health care team must provide care, help and support to enable the patients to take care of themselves and to live with their illness and treatment peacefully.

Results of assessment from the SCNS-TBC could lead to development of practical guidelines that will increase nursing quality in providing enhancement, support and assistance that truly meet the needs of Thai women with breast cancer undergoing chemotherapy. This could enable patients to have better life quality and to live more peacefully with their sickness and chemotherapy treatment. Furthermore, results from precise assessment of SCNs of Thai women with breast cancer undergoing chemotherapy will also be useful for future research into appropriate supportive care process that corresponds with real SCNs of Thai women with breast cancer undergoing chemotherapy.

## **CHAPTER II**

### **LITERATURE REVIEW**

The study of Supportive Care Needs (SCNs) of Thai women with breast cancer undergoing chemotherapy aims to find operational definition and components of SCNs of Thai women with breast cancer undergoing chemotherapy, as well as to construct Supportive Care Needs Scale for Thai women with breast cancer undergoing chemotherapy (SCNS-TBC). The researchers studied and explored the following concepts from textbooks, documents, articles, and related researches: 1) Breast cancer in Thailand, 2) The concept of Supportive Care Needs (SCNs), 3) Supportive Care Needs of patients with breast cancer, 4) Review of Supportive Care Needs instruments, and 5) Scale development and Psychometric properties.

#### **Breast cancer undergoing chemotherapy in Thailand**

Breast cancer is one of the most common and lethal diseases. It sustains to be the number one murderer of Thai women with approximately 14 deaths a day, for a woman is discovered dying in every two hours with breast cancer (Kotepui and Chupeerach, 2013; Sriplung, Wiangnon, Sontipong, Sumitsawan, & Martin, 2006; Vatanasapt, Sriamporn, & Vatanasapt, 2002). Nearly 13% of overall breast cancer in South-Eastern Asia countries, about 13,653 cases at a rate of 29.3 per 100,000, was diagnosed within Thailand (Youlden, Cramb, Yip, & Baade, 2014). Remarkably, 98.2% of all cases were discovered about the invasive stage to advanced invasive stage of breast cancer at the time of diagnosis (Kotepui and Chupeerach, 2013). This



signaled incidence of breast cancer in Thailand is steadily increasing as the country develops (Chlebowski, Butler, Nelson, & Lillington, 1993; Kotepui and Chupeerach, 2013; Sriplung et al., 2006; Vatanasapt et al., 2002).

With the rising number of Thai women who are affected by breast cancer, its effects are also becoming increasingly noticeable as women are taken out of their normal life for doctor's appointments, treatments, extended hospital stays, or in the worst cases, death (Chlebowski et al., 1993; Kotepui and Chupeerach, 2013; Sriplung et al., 2006; Vatanasapt et al., 2002). The ramifications of this disruption are echoed throughout as both the women herself and those around her struggle to adjust to the changes that inevitably come with a diagnosis and treatment of breast cancer (Vatanasapt et al., 2002). These problems are still occurring and remaining as a major public health concern in Thailand.

As the result of newly diagnosis of breast cancer in Thai women, they usually come to the hospital at least in the invasive stage to advanced invasive stage of breast cancer. More than 80% of them should require adjuvant chemotherapy after surgery (Chlebowski et al., 1993; Sriplung et al., 2006; Vatanasapt et al., 2002). Some of them if not, the disease will spread to lymph node and other organs and, ultimately, women death (Chlebowski et al., 1993; Vatanasapt et al., 2002; Wannapornsiri, 2003). Therefore, the chemotherapy is affirmed as the mainly systematic treatment that enabled drugs to reach the site of the tumors as well as distant sites (Stanton et al., 2005).

Currently, there were evidences in Thailand that showed the problems of breast cancer women receiving chemotherapy. About 14% dropped out before the required chemotherapy was completed and 11% had a delay in treatment due to many

side effects of chemotherapy such as the low white blood cell count, severe nausea and vomiting, and fatigue (Naraphong, 2012; Wannapornsiri, 2003). Therefore, these problems in still remain the big problems that have to concern more.

### **Chemotherapy for breast cancer**

Chemotherapy is usually comprised of a combination of drugs that alter cancer cell division and, therefore, cell proliferation. It is used as adjuvant systemic therapy and is aimed at eradicating or arresting micro-metastatic disease (Goodman, 1991). Not only does chemotherapy alter cancer cells, but it also alters normal cells causing associated side effects such as mouth sores, hair loss, nausea, vomiting, fatigue, and a low white cell blood count which makes patients more prone to infections. It is usually given for up to six months after surgery, but is occasionally given prior to surgery to help shrink cancer tumors.

Chemotherapy is frequently used for the treatment of breast cancer. It may be used before or after surgery due to the stage of disease. The purpose of treating cancer cells with chemotherapy is to prevent these cells from multiplying, invading, and metastasizing to distant sites. Unlike surgery or radiation therapy, chemotherapy is a systemic treatment that enables drugs to reach the site of the tumors as well as distant sites (Jansen, Miaskowski, Dodd, Dowling, & Kramer, 2005; McArthur and Hudis, 2007). This regimen kills cancer cells that disseminated from the origin and it decreases the recurrent rate and improves the survival rates because breast cancer is systemic disease and it can affect other body system. Chemotherapy has been associated with increased emotional distress in women who are treated for breast cancer. However, emotional distress seems to decrease when women have better communication with their physicians. Chemotherapy is used routinely for women

with positive lymph nodes and is being used more often with women who have negative lymph nodes, regardless of the type of surgery (Gunn, 1992).

### **Overview and Context of women with breast cancer in Thailand**

The context for Thai women with breast cancer undergoing chemotherapy were women with breast cancer undergoing chemotherapy at chemotherapy unit. Normally, this group was treated at out-patient department (OPD). For the treatment, the patients come in advance to draw blood in order to assess their readiness before receiving chemotherapy. After blood drawing, the patients go home to wait for results and return to meet their doctor in the morning of the appointment date. In case that the patients live far away from the hospital where they will get chemotherapy, they can draw blood at nearby hospital and bring their blood test results on the day of chemotherapy. After seeing their doctor, if their blood test result pass and they are ready to receive chemotherapy, they can undergo chemotherapy at the chemotherapy department which usually takes about four to five hours per person. Then, the patients will be discharged to rest at home after chemotherapy and will return to undergo another cycle of chemotherapy in the next 21-28 days (three to four weeks). On the contrary, if their blood test result is abnormal or their physical conditions are not ready for chemotherapy, their appointment will be postponed until their physical conditions are ready for chemotherapy.

### **Significant problem issues and needs of patients with breast cancer**

More than 60% of long-term survivors indicated that breast cancer had affected their overall health (Schultz et al., 2005). Several studies describe fatigue and lack of energy as relevant problems for women suffering from breast cancer both during active treatment and for long term-survivors (Hoskins, 1997; Girgis et al.,

2000; Hanson Frost et al., 2000; Schultz et al., 2005). Women were impaired by restricted arm/shoulder movements and expressed a need for information about breast reconstruction and prosthesis (Raupach and Hiller, 2002; Schultz et al., 2005). Menopausal problems appeared as hot flashes, night sweats, diminished interest in sex and impaired sexual functioning, as sleep disturbance and impaired ability to concentrate (McPhail and Wilson, 2000; Hunter et al., 2004; Schultz et al., 2005). Specific physical problems related to cancer and its treatment seemed to directly cause psychological problems. Patients reported body image problems, loss of sense of attractiveness, femininity and sexuality (McPhail and Wilson, 2000; Raupach and Hiller, 2002; Schultz et al., 2005).

Emotional distress was one of the most persistent problems in the study by Hoskins (1997). Women suffered from anxiety and stress, felt down and depressed and feared the spread or recurrence of the cancer (Hoskins, 1997; Girgis et al., 2000, Hodgkinson et al., 2007). Acknowledgment from relatives and friends of the exhausting experience of living with breast cancer was the unmet need most often reported by Marlow and colleagues (2003). Retaining a sense of control is an equally relevant need. The sense of successful control was experienced when women were encouraged to choose the level of involvement in decisions regarding treatment and felt able to explore their own expectations about the cause and course of breast cancer (Marlow et al., 2003). Anxious women and women who felt depressed had significantly more unmet needs (Hodgkinson et al., 2007). Women with newly diagnosed breast cancer and adjuvant therapy experienced greater role limitations and impairment in their social functioning than women with stable disease (Hanson Frost et al., 2000).

The women have a continuous need for information. More than 80% of the breast cancer patients wanted as much information as possible, only 16% wanted limited information (Lobb et al., 2001). They wished to be informed about treatment and side effects, cancer remission, length of life, things they could do to help themselves and possible risks for family members to get cancer as well (Girgis et al., 2000; Raupach, and Hiller, 2002). The way in which such information is communicated was important to the women. They wanted their cancer specialist to first check with them to ascertain whether they wanted to know these delicate issues (Lobb et al., 2001). The women desired information which enabled them to manage their illness and the side effects of treatment (Girgis et al., 2000; Hodgkinson et al., 2007) they wanted explanations and to know what to expect, what is physically and psychologically “normal” (Marlow et al., 2003). Women who had to overcome barriers in obtaining health information perceived significantly lower emotional, social and familial well-being, and had a lower perception of their health competence (Arora et al., 2002).

Financial issues are a common problem for cancer patients, because support is required for medical procedures, services such as physiotherapy, aides, prostheses, counseling, transportation and accommodation, along with other practical issues such as child care and ‘home help’, to name a few. These increased financial requirements may also be coupled with a loss of income if a patient is unable to continue employment during treatment, or if family members become full-time caregivers, and concerns about financial issues and how to access relevant information, which may influence a patient’s treatment and wellbeing. It is important to assess the needs of practical of the cancer patients to reduce the burden in their treatment. White and

colleagues (2011) stated that among 15 items of the highest frequency for “some needs” on the Supportive Care Needs Survey in his study, the item for which the greatest was “concern about financial situation”.

### **Current nurse’s role for breast cancer**

#### **1. Providing knowledge for understanding:**

Mostly of patients with breast cancer need to receive information to understand their diagnosis and treatment. Nurse gave information in a way that was easily understood by a face-to-face consultation and a telephone consultation. Moreover, nurses provided holistic information, suitable for the patients and their support people (Brown, Refeld, & Cooper, 2018).

#### **2. Psychosocial support:**

A lot of patients with breast cancer have specific emotional and psycho logical needs in the time leading up to their breast surgery and chemotherapy that the nurse was able to support. The support helped them manage and understand their feelings, as stated by one participant who received a face-to-face consultation. Patients who did not have a preoperative consultation demonstrated the impact of this and were able to articulate the difference they felt a consultation would have made to them, if it had been available. Moreover, patients who had a face-to-face or telephone consultation felt supported and had an opportunity to share emotions, creating confidence in their recovery. (Brown et al., 2018)

#### **3. Practical support:**

The practical support that the nurse was able to provide to patients from the time of their diagnosis to surgery or all treatments; the support also was relevant to the postoperative period also chemotherapy course. In some instances, this advice was

about personal aids and at other times, this practical support was regarding help available from other sources and organizations (Brown et al., 2018).

### **The concept of Supportive Care Needs (SCNs)**

Supportive Care Needs (SCNs) can be defined as a multidimensional concept, which is an important concept defined by Fitch et al. (2008) who set up a Supportive Care Framework (SCF) for treatment of cancer patients in Canada. Definition of SCNs concerns with various issues or problems that cancer patients faced from the initial diagnosis of cancer throughout various stages of treatment. These SCNs include six areas of needs; physical need, emotional need, psychosocial need, spiritual need, practical need, and informational need – which correspond and cover the holistic care viewpoint of nursing profession (Fitch et al., 2008).

However, “needs” in health care viewpoint are individual uniqueness with various definition and can always change. So, it is common that health professions would assess needs with varied approach (Asadi-Lari et al., 2003; Culyer, 1998) to find answers for real needs of patients. The literature was reviewed to verify the concept of SCNs that fit for Thai women with breast cancer undergoing chemotherapy. On verification, the attributes of “supportive care need” for this group did not fit into any existing theory. Therefore, the clarify definition of “need” “supportive care” and “supportive care needs” were necessity.

#### **Needs**

The word “need” is a noun or verb that was searched by dictionaries and previous literature as follow.

The Oxford Advanced American Dictionary (2011) definition refers to need as having a lot of meanings as follows in Table 1

**Table 1** The definition refer to “need” (Oxford Advanced American Dictionary, 2011)

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**Verb**

1. To require something or someone because they are essential or very important, not just because you would like to have them
2. To show what you should or have to do

**Noun**

1. A situation when something is necessary or must be done: To satisfy/meet/identify a need
  2. A strong feeling that you want someone or something or must have something: To fulfill an emotional need
  3. The things that someone requires in order to live in a comfortable way or achieve what they want
  4. The state of not having enough food, money, or support
- 

Other meanings of the word “need” can be found in a medical dictionary. All of them are similarly that present in Table 2

**Table 2** The definition refer to “need” (Medical dictionary, 2015)

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1. Something that is required or necessary. *Basic human needs are those things that are required for complete physical and mental well-being. Needs vary greatly in the degree to which they are necessary for survival. For this reason, they are often classified into a hierarchy according to their relative urgency. Those on lower levels must be met before attention can be paid to needs on higher levels. The most widely used classification is called Maslow's hierarchy of needs, devised by Abraham H. Maslow.*
  2. The perceived or actual requirement for an activity, function or thing
  3. The requirement for an activity, function or thing
  4. Something required, wanted, or essential
  5. A duty or obligation
  6. Any disease or condition for which a patient seeks a remedy
  7. A motivation
  8. Extreme want or poverty
- 
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Other view of the word “need” have been used in previous studies in many aspect that are follow in Table 3

**Table 3** The definition refer to “need” in previous studies

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|  |
|--|
| <ol style="list-style-type: none"> <li>1. “Needs” can be defined as the requirement of some action or resource that is necessary, desirable, or useful to attain optimal well-being (Büchi, 2010).</li> <li>2. A need can be defined as an internal directional force that determines how people seek out or respond to objects or situations in the environment. A need is an internal state or condition, a lack of something that is necessary for well-being and motivates behavior (Büchi, 2010).</li> <li>3. In the studies of the unmet needs of cancer patients, Sanson-Fisher et al. (2000) concluded that need can be defined as “the requirement of some action or resource that necessary, desirable, or useful to attain optimal well-being” (p.227) (Sanson-Fisher et al., 2000).</li> </ol> |
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### **Supportive care**

More recently “supportive care” have gained popularity. Some opinion leaders have called this term euphemisms and others have argued for the need for standardized definitions. From the previous studies, there are some studies that reviewed the concept and definition for “supportive care” as follow in Table 4

**Table 4** The definition refer to “supportive care” in previous studies

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| <ol style="list-style-type: none"> <li>1. (n.) Refer as medical and other interventions that attempt to support and make comfortable rather than to cure (Medical dictionary, 2015).</li> <li>2. Supportive care is defined as the provision of the necessary services for those living with or affected by cancer to meet their physical, emotional, social, psychological, informational, spiritual and practical needs during the diagnostic, treatment, and follow-up phases, encompassing issue of survivorship, palliative care and bereavement (Fitch et al., 2008)</li> <li>3. Supportive care as an all-encompassing service providing care from diagnosis to bereavement. Supportive care interventions that help the patient achieve comfort but do not affect the course of a disease (Allinson, 2014; Hui and Bruera, 2013).</li> <li>4. Care given to improve the quality of life of patients who have a serious or life-threatening disease. The goal of supportive care is to prevent or treat as</li> </ol> |
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early as possible the symptoms of a disease, side effects caused by treatment of a disease, and psychological, social, and spiritual problems related to a disease or its treatment. Also called comfort care, palliative care, and symptom management (Hui and Bruera, 2013).

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*Supportive Care Needs (SCNs)* refer to issues of desire that lead to need and necessity to get assistance from others – family, friend, colleague and health care team – to help patients live with their cancer illness with good life quality. Supportive care needs cover six main areas of the following needs (Fitch et al., 2008).

1. Physical need refers to need for comfort, painlessness, good nutrition, free of malnutrition, and ability to carry on daily activities. These needs relate with various syndromes, such as pain, fatigue, tiredness, nausea, anorexia, weight loss, hair fall, abnormality in swallowing and speaking, and change in sexual relationship.

2. Emotional need refers to need for peace of mind, relationship with others, emotional stability, and confidence. These needs relate with various feelings, such as fear, depression, anxiety, strain, anger, guilt, burden for others, hopelessness, discouragement, and separation from society.

3. Psychosocial need refer to need for ability to adjust oneself to illness and treatment, self-control, positive thinking, and self-confidence. These needs relate with issues like changes in ways of living, sexual relationship problems, critical thinking ability, changes in appearance, and fear for recurrence of illness. It also includes relationship with lovers, relationship within family, and social acceptance. These needs relate with changes in role and duty, response to problem solving, relationship within society, and communication in society.

4. Spiritual need refers to need for meaning and goal of life. These needs relate with issues like religious belief, feeling of self-value, steadfastness and purposefulness, and encountering with hopelessness.

5. Practical need refers to need for direct help to accomplish daily activities. These needs relate with various activities, such as food preparation, housework, commutation to various places and to get treatment, care for grandchildren, economic condition, rights and other related laws.

6. Informational need refers to need for information to help reduce anxiety, confusion, and fear, information to help in decision-making of patients and families, and useful information for promoting patients' skills. These informational needs relate with issues like treatment practice and side effects, solving of several problems, care process, communication with patients and caretakers, and suitable sources of information.

According to supportive care need is an abstract concept and that may be a phrase. It consists two core words, "supportive care" and "needs". The definition of them are present in Table 5 and summary of critical attributes of Supportive Care Needs in Table 6.

**Table 5** Comparison of definition: need, supportive care, and supportive care needs

|   |  |  |
|---|--|--|
| <p>• <b>Definition of need</b></p> <p>“Needs” cover a range of meaning from <u>necessities</u> (man needs water to live) to <u>desires</u> (what I need is a long holiday somewhere in the sun) (Chambers, 1980)</p> <p>“Needs” can be defined as the requirement of some action or resource that is <u>necessary</u>, <u>desirable</u>, or <u>useful</u> to attain optimal well-being (Büchi, 2010)</p> <p>“Needs” can be defined as an <u>internal directional force</u> that determines how people seek out or respond to objects or situations in the environment. A need is an internal state or condition, <u>a lack of something</u></p> | <p>• <b>Definition of supportive care needs</b></p> <p>“<b>Supportive care needs</b>” refer to the patients’ demands for help or support to improve the quality of life. These are necessities for living when they have a serious or life-threatening disease and affect by their situation to meet their physical, emotional, social, psychological, informational, spiritual and practical needs during the diagnostic, treatment, and follow-up phases, encompassing issue of survivorship, palliative care and bereavement (Fitch et al., 2008; Sanson-Fisher et al., 2000)</p> | <p>• <b>Supportive care needs</b></p> <p>refer to necessities for help or support from health care providers during the first course of chemotherapy. They are effects from the conditions of breast cancer and chemotherapy regimen including the physical, psychological, emotional, social, spiritual, practical, and informational dimensions.</p> |
|---|--|--|

**Table 5** Comparison of definition: need, supportive care, and SCNs (Cont.)

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that is necessary for well-being and motivates behavior (Büchi, 2010)

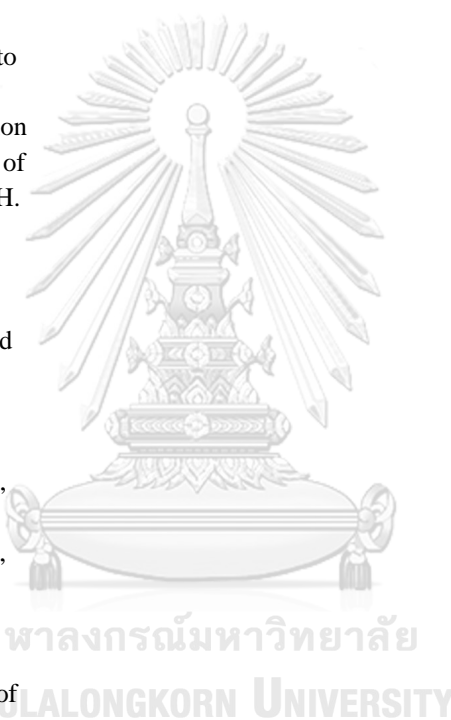
“Needs” refer to something that is required or necessary. Basic human needs are those things that are required for complete physical and mental well-being. Needs vary greatly in the degree to which they are necessary for survival. Those on lower levels must be met before attention can be paid to needs on higher levels. The most widely used classification is called Maslow's hierarchy of needs, devised by Abraham H. Maslow.

- **Definition of supportive care**

“**Supportive care**” is defined as the provision of the necessary services for those living with or affected by cancer to meet their physical, emotional, social, psychological, informational, spiritual and practical needs during the diagnostic, treatment, and follow-up phases, encompassing issue of survivorship, palliative care and bereavement (Fitch et al., 2008)

“**Supportive care**” Care given to improve the quality of life of patients who have a serious or life-threatening disease. The goal is to prevent or treat as early as possible the symptoms of a disease, side effects caused by treatment of a disease, and psychological, social, and spiritual problems related to a disease or its treatment. (Hui and Bruera, 2013)

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**Table 6** Critical attributes of Supportive Care Needs

| Critical Attributes                              | Brief Description  |
|--|--|
| 1. Demanding person                              | Needs represent an imbalance, lack of adjustment, or gap between the present situation or status qua and a new or changed set of conditions assumed to be more desirable. Persons have to recognize the gap between the actual, the possible, and the desirable, and place value on attaining the desirable before they become motivate to change (Büchi, 2010; Leagans, 1964). Demanding person include both patients and their family.   |
| 2. Necessary requiring for help, <i>not cure</i> | Patients' and families' perception of their demand for help and care, need something or someone for controlling symptoms. Not aimed directly at curing their disease but rather is focused at helping the patient and their family get through the illness in the best possible condition.   |
| 3. Including six dimensions                      | Needs were classified into six domains, namely activities of physical and daily living, psychological, practical, sexuality, social, and health information (Harrison et al., 2009). <ul style="list-style-type: none"> <li>• Physical and daily living needs: Physical comfort, freedom from pain, optimum nutrition, and ability to carry out activities of daily living (Kerr, Harrison, Medves, Tranmer, &amp; Fitch, 2007).</li> <li>• Psychological needs: Need for sense of comfort, belonging, reassurance in times of stress and understanding (Kerr et al., 2007).</li> <li>• Practical needs: Need for direct assistance to accomplish a task or activity and thereby reduce demands on the person (Kerr et al., 2007).</li> <li>• Sexuality needs: Needs for information to assistance in sexual felling and relationship (Kerr et al., 2007).</li> <li>• Social needs: Needs related to one's sense of self-worth, competence, and being valued; needs related to family relationships, community acceptance (Kerr et al., 2007).</li> <li>• Health information needs: Need for information to reduce confusion, anxiety, and fear; to better inform the person's or family's decision making; to assist in skill acquisition (Kerr et al., 2007).</li> </ul> |

**Table 6** Critical attributes of Supportive Care Needs (Cont.)

|                                      |   |
|--------------------------------------|---|
| 4. Relating to trajectory of disease | <p>Needs were from pre-diagnosis through the process of diagnosis and treatment to cure, continuing illness or death and into bereavement (Gysels, Higginson, Rajasekaran, Davies, &amp; Harding, 2004; Harrison et al., 2009; Hui and Bruera, 2013; Hui et al., 2013) as showed in figure below. The stage of disease was a key distinguishing factor among “supportive care,” “palliative care,” and “hospice care.” Thus, the different stages of disease are depicted at the bottom, with solid arrows showing that patients can shift from one stage to another. The patient population and scope of service for “supportive care,” “palliative care,” and “hospice care” is shown by the horizontal bars above. Under this model, “hospice care” is part of “palliative care,” which in turn, is part of “supportive care.” Therefore, “supportive care need”, “palliative care need”, and “hospice care need” were used based on the stage of disease and all needs are part of supportive care needs.</p> |
|--------------------------------------|---|

### **Supportive Care Needs of patients with breast cancer**

The review was based on a systematic and searched from inception of each database including the MEDLINE, PubMed, Psych-INFO, Cochrane Database, Cumulative Index to Nursing and Allied Health (CINAHL), Health and Wellness Resource Center, Allied and Complementary Medicine (Caschili, De Montis, Ganciu, Ledda, & Barra), JBI and Web of Science that are published from 2000 through 2015.

A search strategy in this review was searched using key words in combination with BC (breast cancer, breast neoplasm\*) and supportive care needs, need\*, unmet needs\*, unmet supportive care needs, patients’ needs, needs assessment. In addition,

the author reviewed the reference lists of previous reviews to identify potentially eligible studies by Google scholar.

The remaining 23 articles from 792 potentially relevant articles were grouped the prevalence and intensity of supportive care needs (SCNs) of women with breast cancer. Nearly all are cross-sectional in design except for four, which are longitudinal (Halkett et al., 2012; Lee, Francis, Walker, & Lee, 2004; Liao et al., 2011; Minstrell, Winzenberg, Rankin, Hughes, & Walker, 2008b) (Table 7).

Six of these studies recruited patients diagnosed at different stages and undergoing various treatments, including recurring cancers and metastatic forms (Akechi et al., 2011; Au et al., 2011; Brédart et al., 2013; Griesser et al., 2011; Katharine Hodgkinson et al., 2007; Lam et al., 2011), three papers concentrate on those with recurrent and progressive disease (Aranda et al., 2005; Au et al., 2013; Uchida et al., 2010), two specify the exclusion of patients with recurrence or metastases (Erci and Karabulut, 2007; Park and Hwang, 2012), and seven studies do not specify stage inclusion criteria (Girgis, Boyes, Sanson-Fisher, & Burrows, 2000; Girgis, Stacey, Lee, Black, & Kilbreath, 2011; Lee et al., 2004; Mahapatro and Parkar, 2005; Minstrell et al., 2008b; Schmid-Büchi, Halfens, Dassen, & van den Borne, 2011; Schmid-Büchi, van den Borne, Dassen, & Halfens, 2011). Three studies vary in time (Hwang and Park, 2006; Li et al., 2013; Liao et al., 2012), while two studies vary in age of population (Avis, Crawford, & Manuel, 2004; Halkett et al., 2012) (Table 7).



**Table 7** Characteristics of study about Supportive Care Needs in Breast cancer

| Study (Reference)         | No and groups; Study design | Characteristics of women with BC                      | Time since diagnosis (DX)                            | Supportive care needs measures                                       | Data and analysis  |
|---------------------------|-----------------------------|---|--|--|--|
| Akechi et al., 2011       | N = 408<br>Cross-sectional  | Mean age = 56<br>stage 0–IV,<br>recurrence            | 6 months–4<br>years post<br>DX<br>(mean =<br>3years) | SCNS-SF34  | Mean number of<br>supportive care needs<br>per domain, 10 most<br>prevalent supportive<br>care needs, Multiple<br>regression analyses of<br>predictors of need                   |
| Aranda et al., 2000       | N = 105<br>Cross-sectional  | Mean age = 57<br>advanced,<br>recurred,<br>progressed | DX in past<br>12 months                              | SCNQ-59  | Mean scores per<br>domain (0–100),<br>prevalence per<br>domain, prevalence<br>per item, hierarchical<br>cluster analyses<br>identifying women<br>with different need<br>profiles |
| Au et al., 2011           | N = 348<br>Cross-sectional  | all stages,<br>metastases<br>recurrence               | <1 year–29<br>years post<br>DX                       | SCNS-SF34  | Mean scores per<br>domain (0–100),<br>prevalence for all 33<br>items, psychometric<br>analyses   |
| Au et al., 2012           | N = 198<br>Cross-sectional  | mean age = 53<br>SIII, SIV first<br>and recurred      | Mean time<br>since DX:<br>4 months<br>76% pre-<br>CT | SCNS-SF33  | Mean scores per<br>domain (0–100),<br>prevalence for all 33<br>items, multiple<br>regression analyses of<br>predictors of need   |
| Avis et al., 2004         | N = 204<br>Cross-sectional  | Age <50 years<br>old<br>SI, II, and III               | DX<br>between 3<br>months–3<br>years                 | CARES<br>with two<br>extra<br>questions<br>(pregnancy/<br>menopause) | Mean scores (0–4),<br>prevalence for need<br>items above 40%<br>reported, multiple<br>regressions analyses of<br>predictors of need,<br>quantitative and<br>qualitative analyses |
| Brédart, Kop et al., 2013 | N = 384<br>Cross-sectional  | Mean age = 54<br>all stages,<br>metastases            | Post-<br>surgery or<br>in<br>treatment               | SCNS-34,<br>SCNS-BR8   | Mean scores per<br>domain (0–100), 10<br>most prevalent unmet<br>needs, multiple<br>regression analyses<br>with needs scales and   |

**Table 7** Characteristics of study about Supportive Care Needs in Breast cancer  
(Cont.)

| Study (Reference)           | No and groups; Study design                     | Characteristics of women with BC      | Time since diagnosis (DX)                                       | Supportive care needs measures                                    | Data and analysis  |
|-----------------------------|---|---------------------------------------|---|---|--|
| Erci & Karabulut, 2007      | N= 143<br>Cross-sectional                       | Stage II                              | Time since DX<3 years   | Self-Assessed Support Needs                                       | regression residuals as dependent variables to explain discordance between needs and difficulties<br>Mean scores for seven categories, cluster analyses by demographic factors |
| Girgis, Boyes et al., 2000  | N=229 (rural=129, urban=100)<br>Cross-sectional | stage n/a                             | Time since DX between 6 months–5 years (most 3–5 years post DX) | CPNQ + BRCPN  | Fifteen most prevalent needs, prevalence for all eight BC specific items, regression analyses of predictors of need  |
| Girgis, Stacey et al., 2011 | N = 237<br>Cross-sectional                      | stage n/a                             | Time since DX= 3–5 years  | LNQ-BC (based on SCNS, with lymphedem a specific questions added) | Ten most prevalent needs, logistic regression analyses to explore predictors of need   |
| Griesser et al., 2010       | N = 274<br>Cross-sectional                      | Mean age = 57.2 all stages, mostly SI | Newly diagnosed and under treatment                             | SCNS-SF34   | Top five moderate or high needs, top five low, moderate, or high needs, multivariate analyses of patient socio-demographic factors predicting needs                            |
| Halkett et al., 2012        | N = 123<br>Longitudinal                         | stage n/a                             | T1 = first consultation<br>T2 = planning appointment            | RT Concerns, RT Information needs, Patient Information            | Radiotherapy concerns mean scores, RT information needs at each time   |

**Table 7** Characteristics of study about Supportive Care Needs in Breast cancer  
(Cont.)

| Study (Reference)         | No and groups; Study design   | Characteristics of women with BC   | Time since diagnosis (DX)                                 | Supportive care needs measures                  | Data and analysis   |
|---------------------------|---|--|---|---|---|
| Hodgkinson, et al., 2007a | N = 117<br>Cross-sectional  | Mean age = 61<br>all stages  | 3.9 years<br>post DX<br>(2–10 years)                      | CaSUN   | Mean total of met needs, mean total unmet needs, 10 most prevalent met needs, 10 most prevalent unmet needs, one-way ANOVA to assess differences between groups             |
| Hwang & Park, 2006        | N = 459<br>Cross-sectional  | Mean age n/a<br>S0–SIII  | 3 months –<br>15 years<br>post-surgery                    | SCNS-59   | Frequency by domain, 10 most prevalent needs, forward regression analyses of predictors of need   |
| Lam et al., 2011          | N=661<br>Cross-sectional/<br>cultural   | all stages,<br>recurrence,<br>metastases   | Half still<br>under<br>active<br>treatment                | SCNS-34   | Mean scores per domain per country, prevalence for all 34 items per country, multiple regression of associated factors with unmet needs                                     |
| Lee et al., 2004          | N=51<br>Longitudinal  | combination<br>of<br>treatments;<br>50%<br>were between<br>40–50 years of<br>age | T1 =<br>beginning<br>CT<br>T2 = half<br>way<br>through CT | TINQ-BR<br>(Toronto<br>Information<br>al Needs) | Mean scores, 10 most important information needs by rank, t-tests to compare time points  |
| Li et al., 2012           | N = 97<br>Cross-sectional   | S 0 - II   | DX>2<br>years   | SCNS-SF34                                       | Mean scores per domain (0–100), 10 most prevalent needs, multiple regression analyses   |
| Liao et al., 2012         | N: T1 = 124<br>(DX)<br>T2 = 119<br>(1m)<br>T3 = 115<br>(2m)<br>T4 = 114<br>(4m)<br>Longitudinal | M age = 49.37<br>S I, II   | DX to 4<br>months<br>post DX                              | SCNS-SF34                                       | Mean scores per domain per time point, 10 most prevalent needs per time point, repeated measures analysis of variance to analyze changes over time and predictors of change |

**Table 7** Characteristics of study about Supportive Care Needs in Breast cancer  
(Cont.)

| Study (Reference)         | No and groups; Study design   | Characteristics of women with BC                           | Time since diagnosis (DX)                                    | Supportive care needs measures        | Data and analysis   |
|---------------------------|---|--|--|---------------------------------------|---|
| Mahapatro & Parkar, 2005  | N= 75<br>Cross-sectional  | Age = 18–50<br>Mean age = 42.7                             | 6 months-1 year post-surgery                                 | Coping & Concerns Checklist by Devlen | Means and predominant concerns by group: lumpectomy versus mastectomy   |
| Minstrell et al., 2008    | N T1 = 74;<br>N T2 = 83;<br>participants in both = 63<br>Longitudinal | rural sample   | T1 = 1 month post DX<br>T2 = 3 months post DX                | SCNS-59                               | Mean unmet needs compared at two time points, prevalence of top needs compared to earlier study                                   |
| Park & Hwang, 2012        | N = 1084<br>Cross-sectional   | M age = n/a<br>S I, II, III no metastases<br>no recurrence | Four cohorts post DX <1 year, 1–3 years, 3–5 years, >5 years | SCNS-59                               | Ten most prevalent needs, regression analyses of depression and needs, analysis of covariance for comparing four groups and needs |
| Schmid-Büchi et al., 2011 | N = 72<br>Cross-sectional   | stage n/a  | 1–22 months post treatment                                   | SCNS-SF34                             | Means needs per domain (1–5), 12 most prevalent needs, backward regression analyses for factors associated with needs             |
| Schmid-Büchi et al., 2012 | N = 175<br>Cross-sectional  | M age = 57.5<br>stage n/a                                  | 4.2 months post DX, under treatment                          | SCNS-SF34                             | Mean needs per domain (1–5), four examples of prevalent needs, backward regression analyses predicting needs                      |
| Uchida et al., 2011       | N = 85<br>Cross-sectional   | advanced (SIV)<br>recurrence                               | 70 months post DX  | SCNS-SF34                             | Mean needs per domain, correlations between needs and other measures  |

## 1. Prevalence of supportive care needs

Table 8 lists the most domain reported as supportive care needs each article. Across these studies, the highest SCNs were in the health system/information and psychological domains, with dealing with fear of the cancer recurring or spreading as the one most prevalent need. A significant proportion of women report at least one high or moderate SCNs, ranging from 20% (Minstrell et al., 2008b) reporting at least one need across all domains, to 70% expressing supportive care needs (Griesser et al., 2011) specifically in the health information domain.

**Table 8** Prevalence of top five supportive care needs of women with breast cancer

| Items (measure)  | % Prevalence | References   |
|--|--------------|--|
| Supportive Care Needs Survey (SCNS-SF34, SCNS-SF33)                            |              | 10 articles: (Akechi et al., 2011b; Au et al., 2011; Brédart et al., 2013; Griesser et al., 2011; Lam et al., 2011; Li et al., 2013; Liao et al., 2012; Schmid-Büchi et al., 2011; Schmid-Büchi et al., 2011; Uchida et al., 2010) |
| % Rated moderate, high   |              |  |
| -Being informed about things you can do to get well (b)                        | 72           |  |
| -Concerns about the worries of those close to you (a)                          | 67           |  |
| - Being informed about the benefits and side effects of treatments (b)         | 63           |  |
| - Being informed about test results as soon as feasible (b)                    | 62           |  |
| - Having one staff member you can talk to (b)                                  | 61           |  |
| Supportive Care Needs Survey (CNQ, CPNQ, SCNS-59)                              |              | 5 articles: (Aranda et al., 2005; Girgis et al., 2000; Hwang and Park, 2006; Minstrell, Winzenberg, Rankin, Hughes, & Walker, 2008; Park and Hwang, 2012)  |
| % Rated moderate, high   |              |  |
| -Being informed about the benefits and side effects of treatments (b)          | 72           |  |
| -Being informed about remission (b)  | 53           |  |
| -Being given information about managing your illness at home (b)               | 49           |  |
| -Fears of cancer returning (a)   | 46           |  |
| -Being informed about test results as soon as feasible (b)                     | 43           |  |
| -Being informed about things you can do to get well (b)                        | 43           |  |
| -Having access to professional counseling (b)                                  | 43           |  |
| Lymphedema Needs Questionnaire-Breast Cancer (LNQ-BC)                          |              | (Girgis, Stacey, et al., 2011)   |
| % Rated moderate or high   |              |  |
| -Having doctor acknowledge that lymphedema is a serious problem (b)            | 34           |  |
| -Having doctor fully informed about lymphedema and its associated problems (b) | 34           |  |

**Table 8:** Prevalence of top five supportive care needs of women with breast cancer  
(Cont.)

| Items (measure)   | % Prevalence | References                          |
|---|--------------|-------------------------------------|
| -Having doctor willing to treat lymphedema (b)  | 32           |                                     |
| -Non-recognition or coverage of lymphedema by health insurance (f)                          | 30           |                                     |
| -To be informed about alternative treatments for lymphedema (b, c)                          | 30           |                                     |
| -Having doctor/health care professionals willing to follow-up with lymphedema treatment (b) | 30           |                                     |
| Cancer Survivors' Unmet Needs Measure (CaSUN)<br>% Rated unmet                              |              | (Katharine Hodgkinson et al., 2007) |
| -I need help to manage my concerns about the cancer coming back (a)                         | 33           |                                     |
| -I need up-to-date information (b)  | 30           |                                     |
| Cancer Assessment & Rehabilitation Survey (CARES)   |              | (Avis et al., 2004)                 |
| -Concerns about premature menopause   | 57           |                                     |
| -Communication with partner (talking about death)   | 53           |                                     |
| -Worried whether pregnancy would affect breast cancer                                       | 48           |                                     |
| -Body Image   | 47           |                                     |
| -Concerns about body image  | 47           |                                     |
| -Worried whether could become pregnant  | 43           |                                     |

(a) Psychological needs.

(b) Healthy system and information needs.

(c) Physical and daily living needs.

(d) Care and support needs.

(e) Sexual needs.

(f) Financial needs.

## 2. Intensity of supportive care needs

Intensity of supportive care needs was reported as mean scores on each domain, reflecting the mean severity of supportive care needs on that scale; however, not all studies report mean scores. These scores are used to compare severity of needs across different samples, or the same sample at different time points, and to examine factors associated to needs.

Results from review indicated that a substantial proportion of women who have been diagnosed with breast cancer perceive significant SCNs throughout the

cancer trajectory which cluster around several domains, with information and psychological needs being the most prevalent and most intense. Most studies employing instruments that assess a wide range of SCNs demonstrate that *'fear that the cancer is spreading or returning'* is the most prevalent need among women with breast cancer and therefore requires urgent attention. The studies reviewed here that assessed anxiety and depression found higher scores were related to higher psychological needs.

Few health care systems have the resources to implement needs screening for every patient at multiple time points, along with the interpretation of results this entails. A better understanding of the prevalence and intensity of the SCNs of specific groups of women with breast cancer at different moments along the disease trajectory would help care providers predict early on which women are at risk for particular needs and guide the development of supportive care interventions that actually work.

Therefore, the SCNs of women with breast cancer touch upon many domains, clustering around psychological and information needs. From the review what we know about the SCNs of women who have been diagnosed with breast cancer, we can move forward and design the research protocols to refine our understanding in order to predict who is at risk for greater SCNs. In this way, we will learn what we need to know to allocate scarce resources to those who need it most and at the right time.

### **Review of Supportive Care Needs instruments**

There are many tools for need assessment that related to different purpose and different context. The review aim to identify and appraise tools currently available to

support patient assessment. It focused on tools for the systematic assessment of individual needs for help, care or support, to be used for clinical purposes. It sought to undertake a rapid appraisal sufficiently comprehensive to identify existing research, as well as gaps in the field; also sought to identify methodological and clinical issues requiring consideration when developing tools in future.

The researcher used the systematic review method to examine, evaluate, and rethink the SCNs assessment tools. A rapid literature search was undertaken following the general principles outlined in Glasziou's Systematic Review Guide (Glasziou, Irwig, Bain, & Colditz, 2001). It was not intended to be an exhaustive review and was conducted in a limited timeframe, so it was important to quickly identify tools most pertinent to the subject of interest.

This review was based on a systematic and searched from inception of each database including the MEDLINE, PubMed, Psych-INFO, Cochrane Database, Cumulative Index to Nursing and Allied Health (CINAHL), Health and Wellness Resource Center, Allied and Complementary Medicine (Caschili et al.), JBI and Web of Science that are published from 1982 through 2016.

A search strategy was searched using key words either singularly or in combination with tool\*, instrument\*, assessment\* and/or supportive care\*, supportive care needs, need\*, unmet needs\*, unmet supportive care needs, patients' needs, needs assessment. In addition, the reviewer reviewed the reference lists of previous reviews to identify potentially eligible studies by Google scholar. Then, the titles and abstracts of all citations identified were screened. The full texts of potentially relevant articles or reports were obtained. The reference lists of articles and reports were also examined. Each tool was assessed and extracted data in terms of the following aspects



particular the instrument name, items and domains, question format, purpose of instrument, validity and reliability.

There are 27 instruments directly related to the assessment of needs for care in various population (Table 9). The 43 papers recruited various population, different type of cancer. Eight of these studies recruited caregiver of cancer patients (Girgis, Lambert, & Lecathelinais, 2011; Girgis et al., 2013; Hodgkinson et al., 2007; Hollingworth et al., 2013; Jenkinson, 1995; Kim, Kashy, Spillers, & Evans, 2010; Lund, Ross, & Groenvold, 2012; Lund, Ross, Petersen, & Groenvold, 2014). While three papers studied in breast cancer patients in different trajectory of disease, including the ambulatory period (Okuyama et al., 2009), undergoing active treatments (Au et al., 2011; Behice Erci, 2007), and 32 papers studied in mix cancer patients in different stage and period of diseases (Ahmed et al., 2004; Ahmedzai et al., 2005; Asadi-Lari, Tamburini, & Gray, 2004; Bestall et al., 2004; Bonevski et al., 2000; Coyle, Goldstein, Passik, Fishman, & Portenoy, 1996; Crooks et al., 2004; Cull, Stewart, & Altman, 1995; Emanuel, Alpert, Baldwin Jr, & Emanuel, 2000; Emanuel, Alpert, & Emanuel, 2001; Fortner, Okon, Schwartzberg, Tauer, & Houts, 2003; Ganz, Schag, Lee, & Sim, 1992; Harrison, Maguire, Ibbotson, MacLeod, & Hopwood, 1994; Heaven and Maguire, 1996, 1997, 1998; Lidstone et al., 2003; McElduff, Boyes, Zucca, & Girgis, 2004; Network, 2003; Osse et al., 2002; Osse, Vernooij, Schadé, & Grol, 2004; Romsaas, Juliani, Briggs, Wysocki, & Moorman, 1982; Ruland, 1999, 2002; Ruland, White, Stevens, Fanciullo, & Khilani, 2003; Sanson-Fisher et al., 2000; Schag, Ganz, Wing, Sim, & Lee, 1994; Schouten et al., 2016; Tamburini et al., 2000; Marcello Tamburini et al., 2003; Van Ryn et al., 2014; Wright, Selby, Gould, & Cull, 2001) (Table 9).

**Table 9** Summary of needs assessment tools from literature review (27 instruments)

| Instrument  | Items and Domains   | Question format  | Purpose   |
|---|---|--|---|
| <ul style="list-style-type: none"> <li>• SCNS-LF59 (The Supportive Care Need Survey-Long Form 59) (Billie Bonevski et al., 2000; McElduff, Boyes, Zucca, et al., 2004)</li> </ul> <p>Developed from CNQ</p>             | 59 Items; 5 Domains: May have experienced in the last month <ul style="list-style-type: none"> <li>• Psychological (22)</li> <li>• Health system and information (15)</li> <li>• Physical and daily living (7)</li> <li>• Patient care and support (8)</li> <li>• Sexuality (3)</li> </ul> Plus no specific item (4)      | 5-point Likert scale: <ul style="list-style-type: none"> <li>1-No Need (Not applicable)</li> <li>2-No Need (Satisfied)</li> <li>3-Low Need</li> <li>4-Moderate Need</li> <li>5-High Need</li> </ul>                          | To assess perceived level of patients' needs for help   |
| <ul style="list-style-type: none"> <li>• SCNS (The Supportive Care Need Survey) (Sanson-Fisher et al., 2000)</li> </ul> <p>Developed from CNQ</p>   | 70 Items; 3 main sections: <ul style="list-style-type: none"> <li>• 59-need items (5 main factors)</li> <li>• Disease and treatment (8 items)</li> <li>• Patient background (3 items)</li> </ul>  | For 59-need items: score 5-point Likert scale: <ul style="list-style-type: none"> <li>1-No Need (Not applicable)</li> <li>2-No Need (Satisfied)</li> <li>3-Low Need</li> <li>4-Moderate Need</li> <li>5-High Need</li> </ul> | To provide a direct and comprehensive assessment of the multidimensional impact of cancer patient |
| <ul style="list-style-type: none"> <li>• SCNS-SF34-J (The Supportive Care Need Survey-Short-Form 34 of the Japanese version) (Okuyama et al., 2009)</li> </ul> <p>Originally developed by Boyes et al. in Australia</p> | 34 Items; 5 Domains: Indicated the level of need for help over the last month <ul style="list-style-type: none"> <li>• Health system and Information needs (11)</li> <li>• Psychological needs (10)</li> <li>• Physical needs (5)</li> <li>• Patient care and Support needs (5)</li> <li>• Sexuality needs (3)</li> </ul> | 5-point Likert scale: <ul style="list-style-type: none"> <li>1-No Need (Not applicable)</li> <li>2-No Need (Satisfied)</li> <li>3-Low Need</li> <li>4-Moderate Need</li> <li>5-High Need</li> </ul>                          | To assess the perceived needs of patients in specific of Japanese breast cancer patients          |
| <ul style="list-style-type: none"> <li>• SCNS-SF33-C (The Supportive Care Need Survey-Short-Form 33 of the Chinese version) (A. Au et al., 2011)</li> </ul> <p>Developed from SCNS-SF34</p>                             | 33 Items; 4 Domains: <ul style="list-style-type: none"> <li>• Health system, Information and Patient support needs (15)</li> <li>• Psychological needs (10)</li> <li>• Physical and daily living needs (5)</li> <li>• Sexuality needs (3)</li> </ul>  | 5-point Likert scale: <ul style="list-style-type: none"> <li>1-No Need (Not applicable)</li> <li>2-No Need (Satisfied)</li> <li>3-Low Need</li> <li>4-Moderate Need</li> <li>5-High Need</li> </ul>                          | To assess the perceived needs of patients in specific of Chinese breast cancer patients           |

**Table 9** Summary of needs assessment tools from literature review  
(27 instruments) (Cont.)

| Instrument  | Items and Domains  | Question format  | Purpose  |
|---|--|--|--|
| <ul style="list-style-type: none"> <li>• SASNS (Self-Assessed Support Needs of women with breast cancer Scale) (Behice Erci, 2007)<br/><br/>Turkey version</li> </ul>   | 54 Items,<br>7 Dimensions: <ul style="list-style-type: none"> <li>• Diagnosis</li> <li>• Treatment</li> <li>• Support</li> <li>• Femininity and body image</li> <li>• Family and friends</li> <li>• Information</li> <li>• After care</li> </ul>   | 5-point Likert scale:<br>1-No importance<br>2-Not very important<br>3-Moderately important<br>4-Important<br>5-Extremely important | To assessed support needs of women with breast cancer  |
| <ul style="list-style-type: none"> <li>• IHA (Initial health assessment form) (Crooks et al., 2004)</li> </ul>  | Unclear. Common supportive care needs in 7 domains: <ul style="list-style-type: none"> <li>• Physical</li> <li>• Psychological</li> <li>• Practical</li> <li>• Financial concerns</li> <li>• Informational needs</li> <li>• Other special needs</li> <li>• Important personal resources</li> </ul> | Checklist, prompts (facilitating discussion), plus space for management plan   | To aid clinicians in recognition and documentation of supportive care needs of cancer patients         |
| <ul style="list-style-type: none"> <li>• CARES (Flemish version) (The Cancer Rehabilitation Evaluation System) (Ganz et al., 1992; Schag et al., 1994; Schouten et al., 2016)<br/><br/>Original version from English version</li> </ul> | 139 Items; 6 Dimensions: <ul style="list-style-type: none"> <li>• Physical (26)</li> <li>• Medical interaction (11)</li> <li>• Marital (18)</li> <li>• Psychological (44)</li> <li>• Sexual (8)</li> <li>• Miscellaneous (32)</li> </ul>   | 5-point Likert scales (0-4); “Not at all (no problem)” to “Very much (severe problem)”<br>Plus “Do you want help?” (Yes/No) option | To assessed the valuable and comprehensive quality of life and rehabilitation needs of cancer patients |
| <ul style="list-style-type: none"> <li>• NEQ (The Needs Evaluation Questionnaire) (Asadi-Lari et al., 2004; Tamburini et al., 2000; Marcello Tamburini et al., 2003)</li> </ul>   | 23 items; 4 domains: <ul style="list-style-type: none"> <li>• Information (2)</li> <li>• Information regarding examination/ treatment (2)</li> <li>• Communication (4)</li> <li>• Relational (3)</li> </ul> Plus 12 additional items   | Statements (Yes/ No)   | Assessment of informative, psychological and social needs  |

**Table 9** Summary of needs assessment tools from literature review  
(27 instruments) (Cont.)

| Instrument  | Items and Domains  | Question format  | Purpose  |
|---|--|--|--|
| <ul style="list-style-type: none"> <li>• NEST (Needs at the end-of-life screening tool) (Emanuel et al., 2000; Emanuel et al., 2001)</li> </ul> | 13 items; 10 dimensions: <ul style="list-style-type: none"> <li>• Financial burden (1)</li> <li>• Access to care (1)</li> <li>• Social connectedness (1)</li> <li>• Caregiving needs (1)</li> <li>• Psychological distress (2)</li> <li>• Spirituality/religiousness (1)</li> <li>• Personal acceptance (1)</li> <li>• Sense of purpose (1)</li> <li>• Patient–clinician relationship (1)</li> <li>• Clinician communication (1)</li> <li>• Plus 2 additional items</li> </ul>   | 5-point Likert scale (strong agreement–strong disagreement) or discrete responses            | To measure patients’ experiences and perspectives regarding their care |
| <ul style="list-style-type: none"> <li>• OCPC (Oncology clinic patient checklist) (Romsaas et al., 1982)</li> </ul>                             | 86 Items; 15 domains: <ul style="list-style-type: none"> <li>• Information (12)</li> <li>• Fatigue (3)</li> <li>• Pain (3)</li> <li>• Nutrition (7)</li> <li>• Speech and language (4)</li> <li>• Respiration (3)</li> <li>• Bowel &amp; bladder (9)</li> <li>• Transportation (2)</li> <li>• Mobility (5)</li> <li>• Self &amp; home care (8)</li> <li>• Vocational and educational (5)</li> <li>• Interests and activities (6)</li> <li>• Family (5)</li> <li>• Interpersonal relationships (4)</li> <li>• Emotional (7)</li> <li>• Plus 3 open-ended questions</li> </ul> | Checklist for each item—to indicate prevalence of problem<br><br>Plus 3 open-ended questions | To systematically assess problems related to cancer and its treatment  |

**Table 9** Summary of needs assessment tools from literature review  
(27 instruments) (Cont.)

| Instrument  | Items and Domains   | Question format   | Purpose  |
|---|---|---|--|
| <ul style="list-style-type: none"> <li>• PNAT (Patient needs assessment tool) (Coyle et al., 1996)</li> </ul>   | 16 items; 3 domains: <ul style="list-style-type: none"> <li>• Physical (6)</li> <li>• Psychological (5)</li> <li>• Social (5)</li> </ul> Overall discomfort (symptom distress) also measured  | 5-item scale (no impairment–severe impairment) for each item, within context of structured interview  | To screen for potential problems in physical and psychological functioning   |
| <ul style="list-style-type: none"> <li>• PCQ (A Patient-Centered Quality of Supportive care) (Van Ryn et al., 2014)</li> </ul>  | 4 items: <ul style="list-style-type: none"> <li>• Asked about symptoms (bowel problems, pain, fatigue, depression, other symptoms)</li> <li>• Discussion of symptoms</li> <li>• Instructions about symptoms</li> <li>• Receiving wanted help for symptoms</li> </ul>                                | Scoring: Item 1-3<br>-Yes 1<br>-No 0<br>-I am not sure 2<br>Item 4<br>-Yes 1<br>-No 0<br>-I did not have any problems 2<br>-Help not wanted 3       | To assess the interpersonal processes of care that would ideally occur for all patients regardless of symptom status |
| <ul style="list-style-type: none"> <li>• CCM (Cancer Care Monitor) (Fortner et al., 2003)</li> </ul>  | 38 items; 6 domains: <ul style="list-style-type: none"> <li>• General physical symptoms (11)</li> <li>• Treatment side effects (8)</li> <li>• Acute distress (4)</li> <li>• Despair (7)</li> <li>• Impaired ambulation (4)</li> <li>• Impaired performance (4)</li> </ul> Plus one global QoL index | 11-point Likert scales (0–10); “Not a problem” to “As bad as possible”  | To screen high frequency cancer-related symptoms and assess overall symptom severity and QoL                         |
| <ul style="list-style-type: none"> <li>• CHOICES (Creating better health outcomes by improving communication about patients’ experiences assessment) (Ruland, 1999, 2002; Ruland et al., 2003)</li> </ul> | 112 items (symptoms and problems); 6 domains: <ul style="list-style-type: none"> <li>• Cancer specific symptoms</li> <li>• Functional problems</li> <li>• Physical</li> <li>• Psychosocial</li> <li>• Emotional</li> <li>• Spiritual</li> </ul>   | (Yes/No) option. Degree of severity and bother of symptoms. Analogue scales (0–10) rating “Importance” of problems as priorities for treatment/care | To assess patients’ symptoms, functional problems and preferences  |

**Table 9** Summary of needs assessment tools from literature review  
(27 instruments) (Cont.)

| Instrument   | Items and Domains  | Question format  | Purpose   |
|--|--|--|---|
| <ul style="list-style-type: none"> <li>Concerns checklist (J. Harrison et al., 1994; Heaven and Maguire, 1996, 1997, 1998)</li> </ul>            | Refined version =12 items,<br>(Original source =53 items) ; 3 domains <ul style="list-style-type: none"> <li>• Illness (7)</li> <li>• Practical (2)</li> <li>• Psychological (3)</li> </ul>  | Two forms (of refined version): <ul style="list-style-type: none"> <li>• Self-completion: 5-point scale (Not a worry– Extremely worried)</li> <li>• Interview schedule (open questions)</li> </ul> | To elicit and register main concerns of patient   |
| <ul style="list-style-type: none"> <li>PNPC (Problems and needs in palliative care instrument) (Osse et al., 2002; Osse et al., 2004)</li> </ul> | 138 items; 13 domains: <ul style="list-style-type: none"> <li>• Activities of daily living (7)</li> <li>• Physical symptoms (18)</li> <li>• Role activities (4)</li> <li>• Financial and administrative issues (5)</li> <li>• Social issues (15)</li> <li>• Psychological issues (15)</li> <li>• Spiritual issues (5)</li> <li>• Autonomy (9)</li> <li>• Informational needs (9)</li> <li>• Problems in consultations (3)</li> <li>• Overriding problems in quality of care (9)</li> <li>• Concerning the GP (20)</li> <li>Concerning the specialist (19)</li> </ul> | <ul style="list-style-type: none"> <li>• Experienced problems: 3 options (Yes–Somewhat –No)</li> <li>• Needs for care: 3 options (“Yes, more”-“As much as now”- “No”)</li> </ul>                   | A checklist of problems patients experience in palliative care and their needs for care |
| <ul style="list-style-type: none"> <li>Problems checklist (Cull et al., 1995; Wright et al., 2001)</li> </ul>                                    | 16 items; 4 domains: <ul style="list-style-type: none"> <li>• Daily living (4)</li> <li>• Relationships (5)</li> <li>• Economics (2)</li> <li>• Emotions (3)</li> <li>Plus 2 other</li> </ul>  | 4-point scale (0 = no difficulty, 3= severe difficulty)<br>An additional category of ‘5= does not apply to me’ was included in the rating<br>me’ was included in the rating                        | To assess the prevalence and severity of psychosocial problems experienced              |

**Table 9** Summary of needs assessment tools from literature review  
(27 instruments) (Cont.)

| Instrument  | Items and Domains   | Question format   | Purpose  |
|---|---|---|--|
| <ul style="list-style-type: none"> <li>• SPARC (Sheffield profile for assessment and referral to care) (Ahmed et al., 2004; Ahmedzai et al., 2005; Bestall et al., 2004)</li> </ul> | 45 items; 7 domains: <ul style="list-style-type: none"> <li>• Communication and information (1)</li> <li>• Physical symptoms (21)</li> <li>• Psychological issues (9)</li> <li>• Religious and spiritual issues (2)</li> <li>• Independence and activity (3)</li> <li>• Family and social issues (4)</li> <li>• Treatment issues (5)</li> </ul> | <ul style="list-style-type: none"> <li>• Items: help/ information/ contact with professionals (Yes/No)</li> <li>• Remaining items: 4-point rating scale (0–3); “Not at all” to “Very much”</li> </ul> | Developed to assess the distress caused by advanced illness and to screen symptoms and problems to guide referrals to specialist and palliative care |
| <ul style="list-style-type: none"> <li>• Distress management tool (Network, 2003)</li> </ul>  | 36 items; 5 domains: <ul style="list-style-type: none"> <li>• Practical problems (5)</li> <li>• Family problems (2)</li> <li>• Emotional problems (6)</li> <li>• Spiritual/ religious concerns (1)</li> <li>• Physical problems (21)</li> <li>Plus 1 general distress item</li> </ul>   | One rating scale (distress thermometer; 0–10) “Extreme distress” to “No distress”<br>Plus 33 statements (Yes/No)  | Screening tool for rapid assessment  |
| <ul style="list-style-type: none"> <li>• Symptoms and concerns checklist (Lidstone et al., 2003)</li> </ul>   | 32 items (29–32 items); 4 domains: <ul style="list-style-type: none"> <li>• Physical symptoms (11)</li> <li>• Cognitive/ psychological (4)</li> <li>• Other concerns (14)</li> <li>• Patient defined (3)</li> </ul>   | Rating scale ‘how much of a problem’ (0–3); “not at all” to “very much”   | To determine prevalence and severity of symptoms and concerns in routine practice as adjuvant to clinical assessment                                 |
| <ul style="list-style-type: none"> <li>• HCNS (Health Care Needs Survey) (Girgis et al., 2013; Lund et al., 2014)</li> </ul>  | 90 items 6 domains: <ul style="list-style-type: none"> <li>• Information</li> <li>• Household</li> <li>• Patient Care</li> <li>• Personal</li> <li>• Spiritual</li> <li>• Psychological</li> </ul>  | Each item has two Likert scales to rate both the importance and satisfaction of each need statement. Generates an importance score, a satisfaction score and a barrier need score 40 item             | To identified the importance and satisfaction of caregivers' needs   |

**Table 9** Summary of needs assessment tools from literature review  
(27 instruments) (Cont.)

| Instrument   | Items and Domains  | Question format   | Purpose   |
|--|--|---|---|
| <ul style="list-style-type: none"> <li>• CaSPUN (Cancer Survivors' Partners Unmet Needs) (Hodgkinson et al., 2007)</li> </ul>                        | 35 unmet needs items, 6 positive change items, 1 open-ended item; 5 domain <ul style="list-style-type: none"> <li>• Relationships</li> <li>• Information</li> <li>• Partner issues</li> <li>• Comprehensive care</li> <li>• Emotional support</li> </ul>                     | Indicate if they have need and a Likert scale on strength of need | Assessment unmet supportive care needs in partners of cancer survivor |
| <ul style="list-style-type: none"> <li>• SPUNS (The Cancer Support Person's Unmet Needs Survey) (Jenkinson, 1995)</li> </ul>                         | 78 items; 6 domains <ul style="list-style-type: none"> <li>• Information and relationship needs</li> <li>• Emotional needs</li> <li>• Personal needs</li> <li>• Work and finance</li> <li>• Health care access and continuity</li> <li>• Worries about the future</li> </ul> | Five-point Likert (0 no unmet need- 4 very high unmet need)       | To assess unmet needs in caregiver of cancer survivors                |
| <ul style="list-style-type: none"> <li>• NAFCC-C (Needs Assessment of Family Caregivers-Cancer) (Kim et al., 2010)</li> </ul>                        | 27 items; 4 domain <ul style="list-style-type: none"> <li>• Psychosocial unmet needs</li> <li>• Medical unmet needs</li> <li>• Financial unmet needs</li> <li>• Daily activity unmet needs</li> </ul>  | Five-point Likert scale (0 = not at all; 4 = extremely )          | To assess needs in caregiver of cancer survivors                      |
| <ul style="list-style-type: none"> <li>• SNCS-P&amp;C (Supportive Care Needs Survey- Partners and Caregivers) (Hollingworth et al., 2013)</li> </ul> | 40 item; 4 domain <ul style="list-style-type: none"> <li>• Health care service needs</li> <li>• Psychological and emotional needs</li> <li>• Work and social needs</li> <li>• Information needs</li> </ul>   | Four-point Likert scale (1 = no need; 4 = some need-high)         | To assess needs in caregiver of cancer survivors                      |



**Table 9** Summary of needs assessment tools from literature review  
(27 instruments) (Cont.)

| Instrument   | Items and Domains   | Question format                                  | Purpose   |
|--|---|--|---|
| <ul style="list-style-type: none"> <li>• CNAT-C (Comprehensive Needs Assessment Tool for Cancer-Caregivers) (Girgis, Lambert, et al., 2011)</li> </ul> | 41 items; 7 domain <ul style="list-style-type: none"> <li>• Health and psychological problems</li> <li>• Family and social support</li> <li>• Healthcare staff</li> <li>• Information</li> <li>• Religious/spiritual support</li> <li>• Hospital facilities</li> <li>• Services and practical support</li> </ul>  | Four-point Likert scale                          | To identified needs of caregivers of cancer survivors |
| <ul style="list-style-type: none"> <li>• CaTCoN (Cancer Care giver Tasks Consequences and Needs Questionnaire) (Lund et al., 2012)</li> </ul>          | 71 items; 9 domain <ul style="list-style-type: none"> <li>• Caregiving workload</li> <li>• Lack of attention from HCPs on the caregivers wellbeing</li> <li>• Lack pf personal growth</li> <li>• Lack of privacy during conversations with HCPs</li> <li>• Need for help from HCPs</li> <li>• Problems with the quality of information and communication from HCPs</li> <li>• Lack of information from HCPs</li> <li>• Lack of time for social relations</li> <li>• Need for contact to other caregivers</li> </ul> | Four-point Likert scale, don't know/not relevant | To assess needs in caregiver of cancer survivors      |

Each instrument consists various domains that depended on the purpose of instrument. Almost include focus on the health status of patients, providing information on particular symptoms or problems, personal resources and sources of support, care preferences and satisfaction with care. A small number of instruments address needs for care (help or support), such as the CARES, the SCNS, the PNPC and the distress management tool. Most tools address the needs of a general population of cancer patients and were developed with mixed groups. A few, however, were developed to address the needs of specific groups of patients, such as those with advanced cancer (PNPC, SPARC and symptoms and concerns checklist) or, even more specifically, at the end of life (Glasziou et al., 2001).

Table 9 provides an indication of the domains covered by the tools and their relative emphasis in terms of different areas of need. The content of tools was compared using the domains of needs related to health status and needs for, and satisfaction with, health care and Tables 10 provide a matrix of the domains of the individual tools.

Question formats reflect purpose. These include adjectival, semantic differential and Likert-type scales that address particular aspects of need such as the degree to which a problem is experienced, the degree of bother or the degree of importance. Checklists tend to utilize dichotomous items (yes or no) to indicate wants for help or the presence or absence of a need. Many of the tools adopt a combination of formats to accommodate different types of questions.







| Instrument | Type of cancer of patient |               |           | Caregiver | Domains of instrument |     |      |     |     |     |     |       |     |        |     |       |      |        | Validity | Reliability |      |
|------------|---------------------------|---------------|-----------|-----------|-----------------------|-----|------|-----|-----|-----|-----|-------|-----|--------|-----|-------|------|--------|----------|-------------|------|
|            | Mix Ca                    | Breast cancer |           |           | Psyc                  | Inf | Phys | Sup | Sex | Emo | Spi | Inter | Mar | Miscel | Sym | Treat | Prac | Impair |          |             | Help |
|            |                           | Ambulatory    | Treatment |           |                       |     |      |     |     |     |     |       |     |        |     |       |      |        |          |             |      |
| CaTCoN     |                           |               |           | *         | *                     |     | *    | *   |     |     |     | *     |     | *      |     |       | *    | *      | *        | *           |      |

Note: Psyc-Psychological, Inf-Information, Phys-Physical, Sup-Support, Sex-Sexuality, Emo-Emotion, Spi-Spiritual, Inter-Interaction, Mar-Marital, Miscel-Miscellaneous, Sym-Symptom, Treat-Treatment, Prac-Practice, Impair-Impairment, Help-Help

The searches identified 27 tools designed for routine clinical assessment of patients' needs. Most had been carefully constructed but lacked generalizability across the cancer trajectory and focused on one particular context for care or point in the cancer pathway. A few instruments had been developed without recourse to patient input, thus liable to assess needs seen to be important solely from a professional perspective. All had very different organizing structures, and few covered all the dimensions of need, failing to offer a comprehensive approach to assessment. This is probably due to the different viewpoints from which the tools were developed. Some topics generally regarded as important in cancer and palliative care, such as spirituality, were often missing.

The 27 tools were employed for differing purposes: to identify and prioritize actual problems; to identify patient preferences regarding treatment and care; to monitor responses to treatment and changes in symptoms, functioning or well-being; or to screen for potential problems. Most are constructed to assess experienced problems in health status rather than perceived needs for care.

Tools to be used in routine clinical care should depict a robust image of reality and possess reasonable psychometric properties. Validity and reliability have been addressed to varying degrees: in some tools thoroughly, in others not at all. The merit of qualitative methods to ensure that tools are aligned closely to patients' needs should not be overlooked during the development process.

The dynamic nature of need and the desirability of monitoring patients' responses to care interventions over the course of their illness and treatment experience mean that tools should have the ability to capture change. It is disappointing that very few tools had been tested over time for their responsiveness to change. Cancer is not one disease but a general diagnosis for over 100 different diseases with different natural histories and treatments. It is questionable whether one tool might reasonably cover all stages of illness and environments for care, and there might be an argument for supplementing 'core' content of a generic tool with items specific to particular populations to achieve comprehensive coverage (Richardson, Medina, Brown, & Sitzia, 2007).

### **Needs assessment tools for breast cancer patients**

From 27 instruments of needs assessment, there are 20 instruments of needs assessment for mix cancer patients divide groups in different purpose. There are 12 instruments that focus on the problem or symptom checklists, one instrument focus on health related quality of life, one instrument point to assess in rehabilitation, and one instrument direct to end of life period. Therefore, only five instruments are appropriated to assess SCNs in breast cancer patients: SCNS-LF59, SCNS, SCNS-SF34-J, SCNS-SF33-C, and SASNS (Table 11).

**Table 11** Comparison of five supportive care needs assessment instruments

|                                 | <b>SCNS-LF59</b>  | <b>SCNS</b>  | <b>SCNS-SF34-J</b>   | <b>SCNS-SF33-C</b>  | <b>SASNS</b>  |
|---------------------------------|---|--|--|---|---|
| <b>Full name of instrument</b>  | The Supportive Care Need Survey-Long Form 59  | The Supportive Care Need Survey  | The Supportive Care Need Survey-Short-Form 34 of the Japanese version                    | The Supportive Care Need Survey-Short-Form 33 of the Chinese version                    | Self-Assessed Support Needs of women with breast cancer Scale (Turkish version) |
| <b>Original version</b>         | Developed from CNQ  | Developed from CNQ   | Developed from SCNS-SF34   | Developed from SCNS-SF34  | None  |
| <b>Author</b>                   | (Billie Bonevski et al., 2000; McElduff, Boyes, Zucca, et al., 2004)  | (Sanson-Fisher et al., 2000)   | (Okuyama et al., 2009)   | (Au et al., 2011)   | (Behice Erci, 2007)   |
| <b>Purpose of instrument</b>    | To assess perceived level of patients' needs for help   | To provide a direct and comprehensive assessment of the multi-dimensional impact of cancer patient | To assess the perceived needs of patients in specific of Japanese breast cancer patients | To assess the perceived needs of patients in specific of Chinese breast cancer patients | To assessed support needs of women with breast cancer                           |
| <b>Theoretical underpinning</b> | <b>Human needs of Maslow</b> (1998): Human beings are more than physical entities. They also have emotional, psychological, social and spiritual aspects. | <b>Human needs of Maslow</b> (1998)  | None given   | None given  | None given  |



**Table 11** Comparison of five supportive care needs assessment instruments

(Cont.)

|  | SCNS-LF59   | SCNS   | SCNS-SF34-J  | SCNS-SF33-C  | SASNS   |
|--|---|--|--|--|---|
| <b>Definition of supportive care needs</b> | Needs is a gap between patients' experience and their expectations  | None given   | None given   | None given   | None given  |
| <b>Items and domains</b>                   | 59 Items;<br>5 Domains:<br>May have experienced in the last month<br><ul style="list-style-type: none"> <li>• Psychological (22)</li> <li>• Health system and information (15)</li> <li>• Physical and daily living (7)</li> <li>• Patient care and support (8)</li> <li>• Sexuality (3)</li> </ul> Plus no specific item (4) | 70 Items;<br>3 main sections:<br><ul style="list-style-type: none"> <li>• 59-need items (5 main factors)</li> <li>• Disease and treatment (8 items)</li> <li>• Patient background (3 items)</li> </ul> | 34 Items;<br>5 Domains:<br>Indicated the level of need for help over the last month<br><ul style="list-style-type: none"> <li>• Health system and Information needs (11)</li> <li>• Psychological needs (10)</li> <li>• Physical needs (5)</li> <li>• Patient care and Support needs (5)</li> <li>• Sexuality needs (3)</li> </ul> | 33 Items;<br>4 Domains:<br><ul style="list-style-type: none"> <li>• Health system, Information and Patient support needs (15)</li> <li>• Psychological needs (10)</li> <li>• Physical and daily living needs (5)</li> <li>• Sexuality needs (3)</li> </ul> | 54 Items,<br>7 Dimensions:<br><ul style="list-style-type: none"> <li>• Diagnosis</li> <li>• Treatment</li> <li>• Support</li> <li>• Femininity and body image</li> <li>• Family and friends</li> <li>• Information</li> <li>• After care</li> </ul> |
| <b>Question format</b>                     | 5-point Likert scale:<br>1-No Need (Not applicable)<br>2-No Need (Satisfied)<br>3-Low Need<br>4-Moderate Need<br>5-High Need  | For 59-need items:<br>score 5-point Likert scale:<br>1-No Need (Not applicable)<br>2-No Need (Satisfied)<br>3-Low Need<br>4-Moderate Need<br>5-High Need   | 5-point Likert scale:<br>1-No Need (Not applicable)<br>2-No Need (Satisfied)<br>3-Low Need<br>4-Moderate Need<br>5-High Need   | 5-point Likert scale:<br>1-No Need (Not applicable)<br>2-No Need (Satisfied)<br>3-Low Need<br>4-Moderate Need<br>5-High Need   | 5-point Likert scale:<br>1-No importance<br>2-Not very important<br>3-Moderately important<br>4-Important<br>5-Extremely important  |

**Table 11** Comparison of five supportive care needs assessment instruments

(Cont.)

|                                    | SCNS-LF59  | SCNS   | SCNS-SF34-J   | SCNS-SF33-C   | SASNS  |
|------------------------------------|--|--|---|---|--|
| <b>Target population</b>           | Cancer patient   | Cancer patients (Breast 32%)   | Ambulatory female breast cancer (Age >20yrs.)   | Chinese women with breast cancer  | Women with breast cancer (stage II)  |
| <b>Trajectory of Breast cancer</b> | Receiving treatment for cancer   | Undergoing treatment at the surgical, radiation, or medical oncology department of 9 major public cancer treatment centers in New South Wales, Australia (N=888) | Ambulatory period and attending the <u>outpatient</u> clinic of the Oncology, Immunology and Surgery of Nagoya City University Hospital (N=408) | After diagnosis then undergoing active treatment: chemotherapy (56.2%) at <u>outpatient</u> oncology unit at 6 public hospital in Hong Kong (N=348) | Underwent mastectomy and applied to the Medical Oncology Department: chemotherapy (46.2%) at <u>outpatient</u> and <u>inpatient</u> oncology clinics (N=143) |
| <b>Content validity</b>            | Preliminary interviews and pilot study with convenience sample of 200 cancer patients<br><br>A panel of professional members | Reviewed by a team of clinical experts and pilot-tested with 200 patients with cancer  | None  | None  | A panel of 7 specialists   |
| <b>Construct validity</b>          | Factor analysis  | Factor analysis  | Convergent validity calculating by Spearman's Rank correlation coefficients 0.30-0.50<br>Discriminant validity (discriminate between            | EFA<br><br>Convergent validity (Good)<br><br>Divergent validity (Good)<br><br>(Know group   | Factor analysis<br><br>Kaiser-Meyer-Olkin (KMO) 0.80 and Bartlett's test   |

**Table 11** Comparison of five supportive care needs assessment instruments  
(Cont.)

|                    | SCNS-LF59                                  | SCNS                                       | SCNS-SF34-J  | SCNS-SF33-C  | SASNS   |
|--------------------|--|--|--|--|---|
|                    |  |  | subgroups of patients)   | comparison approach: active  |   |
|                    |  |  | Factor validity using principal components factor analysis with varimax rotation | treatment VS no active treatment; early stage disease VS advanced disease) |   |
| <b>Reliability</b> | Cronbach's alpha coefficients<br>0.87-0.97 | Cronbach's alpha coefficients<br>0.87-0.97 | Cronbach's alpha coefficients<br>0.85  | Cronbach's alpha coefficients<br>0.75-0.92                                 | Cronbach's alpha coefficients<br>0.71-0.84 and 0.93 for the whole scale |

*Theoretical underpinning and definition of supportive care needs:*

There are two instruments: SCNS-LF59 and SCNS that draw upon the construct of Human need of Maslow (1998), while other three instruments were not given the information. In addition, the definition of supportive care needs of each instrument were not clear. Only one of all, SCNS-LF59, mentioned needs as a gap between patients' experience and their expectations. It was quite general meaning of needs.

*Content and question format:*

From table 11 provides an indication of the domains covered by the tools emphasis in terms of need. Four instrument except SASNS consisted the similar domains: psychological, health system and information, physical and daily living, patient care and support, and sexuality dimensions. While the SASNS focused on the

dimension of diagnosis, treatment, support, femininity and body image, family and friends, and information after care. Question formats reflect purpose. All are 5 Likert-scales that address particular aspects of need: the degree to which a problem is experienced, the degree of bother or the degree of importance.

*Psychometric properties:*

All instruments reported the good psychometric properties including the content validity, construct validity, convergent validity, discriminant validity, as well as the reliability.

Table 11 shows the similar purpose for which the tools were developed. All five instruments address needs for care, help or support. Two of all: SCNS-LF59 and SCNS address the needs of general population of cancer patients and have been developed with mixed group. While the three instruments: SCNS-SF34-J, SCNS-SF33-C, and SASNS were developed to address the needs of specific groups of patients, such as those with breast cancer patient in each countries: Japan, China, and Turkey, respectively.

1. *Supportive Care Needs Survey: SCNS-LF59* (Bonevski et al., 2000) (Bonevski et al., 2000) is an assessment tool for SCNs of all kinds of cancer patients. The SCNS-LF59 consists of 59 items that focus on various problems covering 5 aspects of needs: 1) physical need, 2) health and informational need, 3) physical and daily living need, 4) care and support need, and 5) sexual relationship need. As well as Supportive Care Needs Survey: SCNS-SF34 (Boyes et al., 2009) is an assessment tool for SCNs of all kinds of cancer patients which is developed from the Supportive Care Needs Survey: SCNS-LF59.

2. *Supportive Care Needs Survey: SCNS* (Sanson-Fisher et al., 2000) is an assessment tool for SCNs of all kinds of cancer patients that consists of 70 items: 59-need items (5 main factors), disease and treatment (8 items), and patient background (3 items).

3. *Supportive Care Need Survey-Short- Form 34 of the Japanese version (SCNS-SF34-J)* (Okuyama et al., 2009) is an assessment tool for supportive care needs of all kinds of cancer patients which is developed from the Supportive Care Needs Survey: SCNS-SF34 in Japanese language version.

4. *Supportive Care Need Survey-Short- Form 33 of the Chinese version (SCNS-SF34-C)* (Au et al., 2011) is an assessment tool for supportive care needs of all kinds of cancer patients which is developed from the Supportive Care Needs Survey: SCNS-SF34 in Chinese language version.

5. *Self-Assessed Support Needs of women with breast cancer Scale (Turkish version) (SASNS)* (Ozbayir et al., 2017) is an assessment tool for supportive care needs of all kinds of cancer patients which is developed from the Supportive Care Needs Survey: SCNS-SF34 in Turkish language version.

From five instruments of needs assessments, most were developed for use in a hospitalized cancer patients; the exceptions are the SCNS-SF34-J, SCNS-SF33-C (designed for an outpatient clinic) and SASNS can be used both in an outpatient and inpatient oncology clinic. However, each instrument were used in different period of trajectory disease.

It could be seen that all five assessment tools for SCNs were developed from the same original instrument, that is, the Supportive Care Needs Survey: SCNS-SF34, with improvement and development to suit cancer and breast cancer patients in

specific cultural context of the country – Japan, China and Turkey. This advocates the concept that pattern of supportive care needs is individual and differs according to context and culture. Moreover, this study is particularly specific to breast cancer patients who are undergoing chemotherapy. It is different from groups of breast cancer who receive other treatment. Therefore, all of the existing five assessment tools may not cover assessment of SCNs of Thai women with breast cancer undergoing chemotherapy according to perception and viewpoint of those with direct experience.

### **Scale development and Psychometric properties**

Research instrument used to collect data is important in making data collection concise and direct, with ability to differentiate results correctly according to research objectives. Therefore, every step in the instrumental construction procedure must be accurate and reliable so the constructed instrument could reduce error, increase reliability, and really measure the things to be measured. The researchers study instrumental construction method of DeVellis (2012, 2016), and Streiner and Norman (2008). The step and process are bases on the goal of an instrument. The overview of each step of instrument development is divided into two phase including 1) instrument construction and 2) psychometric properties evaluation (DeVellis, 2012, 2016; Streiner and Norman, 2008). Important steps of the instrumental construction and test of the instrument's Psychometric properties could be summarized as follows:

1. Instrument construction is divided into the following steps:

- 1.1 Step 1: Clarifies the concept and identifies its critical components.

Specification of concept and components of the things to be assessed is to give clear meaning or definition of the concepts or things to be measured. The concept analysis will clarify the scope and components of the concepts in order to specify conceptual definition and operational definition for practical measurement (DeVellis, 2012). After understanding concepts and related theories, the researchers could specify definition of the theory and identify attributes of the things to be assessed. Since these things refers to the ability of an instrument to index the concepts with precision, and sensitivity, it is necessary to clarify the concept in area of interest for developing the questionnaire scale. The aims to define the concept include the concept clarification and operationalization of the concept. Both processes will describe as follows:

*1.1.1 Concept clarification:* The concept will define and analyzed in several ways. The concept has been simply defined as a thought, notion, or idea (Waltz, Strickland, & Lenz, 2010), or defined as a mental image of a phenomenon; an idea or a construct in the mine about a thing or an action (Walker, 2005). Concept is defined as the content of interest in measuring phenomena. Phenomena are observable facts of events. To render a concept measurable, it is necessary to translate concept into measurable phenomena (Waltz et al., 2010). Concept analysis is a useful method for defining a concept when a body of theoretical literature exists. The results of concept analysis, the operation definition, list of defining attributes, and antecedents can provide the scientist with an excellent beginning for a new tool. To begin a new tool, items could be constructed to reflect each of the defining attributes. Also, questions could be constructed to determine whether proposed antecedents occurred (Walker, 2005).

*1.1.2 Operationalization of the concept:* The process of operationalization of the concept has been proposed by Waltz and colleagues. This process involves five steps: 1) developing the theoretical definition; 2) specifying variables derived from the theoretical definition; 3) identifying observable indicators; 4) developing meaning for measure the indicators; 5) the evaluating the adequacy of the resulting operational definition (Waltz, 2010). The investigator will identify the dimensions of the concept from several methods including literature review, inductive qualitative study, or deriving concepts from other fields. Finally, the investigators have to determine and define how to measure the concept using the specific empirical indicators and procedures that can be used to measure the concept. The result of operationalization of the concept is the operationalization definition.

However, the concept to be studied may not be explained clearly from several methods of literature review. This is because it may be multidimensional concept like “Supportive Care Needs (SCNs)” which is about “Needs” - an individualism concept that depends on objectives and population group to be studied. Thus, an inductive method with qualitative data collection method through in-depth interviewing the population group with direct experience. This is a feature of specifying operational definition with emic view (Markee, 2013).

Emic view is a view in interpreting or giving meaning of informant's community that reflects the thought towards real or assumed situations under certain condition, without the researchers' judgment as "right/wrong". But this does not mean that the data is already reliable because informants may have different thinking basis/learning basis/experience. Consequently, they may give different information even though they are in the same situation and context. In case that the



data refers to contradictory references, data that are opinions maybe normal, but data that refer to recorded documents should be rechecked with existing evidences/documents. Data that are not recorded should be verified with related/referred person. Then, the content should be analyzed for hidden implications.

Nevertheless, there are various patterns of search for meaning, including literature review, focus group, interview, Delphi technique, or integration of several techniques, depending on philosophical basis of the researchers and purposes of the research.

#### 1.2 Step 2: Generates an item pool

After concept analysis, search for and understanding of, and getting clear meaning, scope and components. The researchers could use these to construct question items in many ways: improve from existing research, write new items by reviewing literature and related researches, analyze data from interviewing experts and those with direct experiences or population group of the study, including brainstorming and focus group (Streiner and Norman, 2008). These procedures enable the researchers to construct instrument with content validity, called Priori content validity. The written question items must correspond with the content to be studied and the content must cover every answer. The appropriate item should not be ambiguous. Each scale language should be simple, clear, and directly. The construction process needs to eliminate items with several characteristics, such as, statements with a quandary, factual statements that contain longer than 20 words, and compound or complex sentences, items that express more than one idea or use multiple negatives (DeVellis, 2012, 2016).

Another concern in item construction is the number of items that should be constructed for any scale because the major source of error within a test is the sampling of items. The more items in the measure, the less the error, therefore, the number of the initial items pool should be large enough to insure against poor internal consistency (DeVellis, 2012, 2016). The number of the items in an initial pool should be developed at least two times before the final scales are determined.

### 1.3 Step 3: Determines the format for measurement

Determines the format for measurement by considering definition of the concepts, definitions or variables in making decision to choose pattern of measurement. The most commonly found measurement pattern is Likert scale, including a Rating scale which is popularly used with questionnaire that measure attitude or belief. This type of questionnaire consists of several question items that identify things to be measured with scores. For each question, respondents could assess value by themselves. Choices are divided into 3-7 levels (Fayers and Machin, 2000). Level of opinion could be classified according to level of measurement that the researchers want, in order to indicate intensity of attitude. Question items consist of positive and negative questions. But too few choices could result in low precision and reliability. However, the only difference is in a series of response options where Numerical Rating scaling employs one dimensional measurement ranging from the lowest to the highest or the highest to the lowest, representing by numbers. On the other hand, Likert scaling uses measurement options of opposite dimensions, such as “strongly disagree”, “moderately disagree”, “mildly disagree”, “mildly agree”, “moderately agree” and “strongly agree” (DeVellis, 2012; Wetzell and Greiff, 2018).

There are two parts in the format of measurement and defining the choices of responses to items: first, is the nature and numbers of the responses options; and second, is the particular instruction. In detailed consideration, agreement options are usually bipolar and symmetrical around a neutral point and may include statements such as strongly agree, agree, uncertain, disagree, and strongly disagree. Items can be written to assess many different types of variables, including attitudes, personality, and opinion. Evaluation options ask the respondent for an evaluative rating along a good and bad feature, such as positive to negative or excellent to terrible. It can be used to assess attitude an investigate performance. Frequency is usually used to investigate how often or how many times the respondents have performed particular behavior. These options include statement such as rarely, seldom, sometimes, and frequently. Besides, each choice should be contain 13 words or phrases and scale value should be order from low to high for each choice. The maximum number of categories should be generally using remarkably seven plus or minus two (five to nine) for discrimination ability. The scale developers have to specifically address the design of the instruction to maximize accuracy of the findings. The instructions are necessary for the respondents who are not familiar with the scale (Spector, 1992).

#### 1.4 Step 4: Reviews items

Reviews items to consider consistency of question items by experts. In this step, examiners of research instrument are selected by considering expertise of each person regarding the topic to be studied, as well as consulting with those who have knowledge and expertise both in the content that the researchers are interested in and in research methodology. Experts will help the researchers to better construct

instrument that could measure variables relating to the content (Waltz et al., 2010). The draft questionnaire is examined by the thesis advisory committee for consistency of question items, appropriateness of question items, and addition of necessary items or deletion of repeated items.

The preliminary review of all test items should be done once the generation of items has been completed. Item review is a method that many investigators use to evaluate an instrument. This review serves multiple purposes related to maximizing content validity of the scale (DeVellis, 2012, 2016). Having experts review the item pool can confirm or invalidate definition of the phenomenon. The mechanics the obtaining evaluations of item relevancy usually involve providing the expert panel with a working definition of the construct. The content of an item should be related to the construct. This process is necessary to submit the blueprint specifications to the experts and representatives of the population of the area of interest. At this step, the five appropriate, accurate, and representative experts would be selected as content validators since this numbers of experts would provide an enough level of control for chance agreement (Burns, 2011). This indicated that individuals with experts in various fields might be sought, for example, one with knowledge of instrument development, a second with clinical expertise in appropriate field of practice, and a third with expertise in another discipline relevant to the content area.

It needed to calculate the item level for content validity index (I-CVIs) and interrater agreement for quantifying the extent of agreement between the experts (Polit and Beck, 2012). Waltz (2005) suggested that it should be assessed interrater agreement in the expert's use of the rating scale to solve the problem of disagreements

among experts affected by the differences in the education and experiential backgrounds of panel experts. Interrater agreement scores range from 0 to 1. Although, the acceptance of interrater agreement score is .70 or over .80 or better that is agreement for new instruments. The first draft of the questionnaire should be revised according to the critique.

The aspects of each item to be considered by content specialists during item review include accuracy, clarity, appropriateness or relevance to the test specifications technical flaws, grammar, offensiveness or bias in items, and level of readability. Waltz (2005) recommended that at least of three subjects review the questionnaire. However, the number of subjects depends on the complexity of the instrument or the homogeneity of the target population representatives should be asked to complete the tool and then specify 1) which items they had difficulty responding to and why, 2) which items they have questions about, 3) revisions they believe should be made, and 4) suggestions for items that should be included. Finally, appropriate revisions should then be made.

#### 1.5 Step 5: Considers inclusion of validated items

That is, the instrument has ability to measure directly and completely cover scope of content that are important components of the concepts or variables to be measured. This depends on sufficient relation of each chosen message or question item with the things to be measured. This type of validity is used for measuring achievement or knowledge and understanding. The construction of instrument to have content validity after finishing is called Posterior content validation (DeVellis, 2012; Waltz et al., 2010). On the other hand, Face validity refers to an examination of instrument to see the instrument could really measure. Furthermore, it also depends on

experience of related person that leads to different results (Polit, Beck, & Owen, 2007).

#### 1.6. Step 6: Conducts a Pilot study by computing internal consistency

Initial field trial of the instrument aims to test understanding in meanings of question items, method of answering questions, and sequencing of questions. It also checks initial reliability of the instrument. This initial trial tests the instrument with the sample group that is most similar with the population group of the actual research.

After testing the instrument, the researchers should ask about problems in answering the questionnaire and suggestions to improve the questionnaire. These include improvement of language used, missing question items, excessive items, or items that make respondents hesitate or unwilling to answer, in order to reduce unanswered question. Confidence index and Cronbach's Alpha - both by aspect and overall - are calculated, with acceptable value of 0.7 or over (Streiner and Norman, 2008). The Item-total correlation which is discrimination value of each item must be between 0.2-0.7 (DeVellis, 2012). This is a relationship between item score and overall version score that reflects consistency or stability of each item and the version total score.

## 2. Psychometric Properties Evaluation

After the instrument is judged to be satisfactory, the quality of the instrument must be evaluated. Two basic psychometric characteristics should be examined in instrumentation, including validity and reliability (DeVellis, 2012; Polit and Beck, 2012), this stage is divided to the two following steps:

### 2.1 Step 7: Tests validity and reliability of the research instrument

An important matter is a test with the sample group suitable for numbers of question item, which should be sufficient to represent the population. A suitable number of samples is considered in ratio of number of question, which should be 10 to 1 or 300 samples (Nunnally, 1994). The test is conducted as follow:

*2.1.1 Validity:* Validity refers to how well the questionnaire measures what it is supposed to be measuring. Validity is not a property of an instrument, but of the instrument's scores and their interpretations (Cook and Beckman, 2006). In the process of validity, when we translate a construct into a functioning and operating variable, as the operationalization, we need to be concerned about how well we did the translation in that construct. The validity of the instrument's scores hinges on the construct, so a clear definition of the intended construct is the first step in validity evaluation.

There are three types of validity typically mentioned in texts and research reports when talking about the quality of measurement, including content validity, criterion-related validity, and construct validity (DeVellis, 2012, 2016; Messick, 1993). However, contemporary thinking on the types of validity suggests that all types of validity should be conceptualized under one overarching framework of construct validity (Messick, 1993). This approach revealed that the scores of the instrument are only useful, so they reflect a construct of the instrument and evidence should be collected to support this relationship. The concepts of content and criterion validity are preserved as sources of validity evidence within the construct validity.

*1) Content validity* concerns the degree to which an instrument has an appropriate sample of items, taken together, constitute an adequate operational definition of the construct being measured (Nunnally, 1994; Polit and Beck, 2012).

The instrument has content validity when its items are a randomly chosen subset of the universe of appropriate items. Content validity is an essential step in the development of new empirical measuring instruments because it represents a beginning mechanism for linking abstract concepts (latent variables) with observable and measurable indicators. Two interrelated steps are identified in this process: (a) identifying the entire domain of content related to the phenomena of interest beginning with a thorough review of literature, (b) developing instrument items associated with the identified domain of content (DeVellis, 2012).

Content validity is largely a matter of judgment, involving two distinct phases: (a) a priori effects by the scale developer to enhance content validity through careful conceptualization and domain analysis prior to item generation, (b) a posteriori effects to evaluate the relevance of the scale's content through expert assessment (Mastaglia, Toye, & Kristjanson, 2003). The resulting instrument content validity is based mainly on the judgment, logic, and reasoning of the researcher with validation from a panel of judges holding expertise in the domains of content. The proportion of experts who are in agreement about item relevance provides a quantitative measure of content validity. The experts will be asked to evaluate individual items on the new scale as well as the entire instrument with regard to item relevance and adequately measuring in terms of the construct. With regard to item relevance, the multirotor kappa coefficient of agreement and a Content Validity Index (CVI) are computed across the experts' ratings of each item's relevance. A new content valid instrument should have a minimum CVI of .80 or better.

From some materials presented that the face validity and content validity are sometime confused because both may concern the extent to which



item content appears relevant to the construct of interest. However, content validity is defined in terms of more specific, structure and rigorous than face validity. Therefore, face validity is the evaluation which the items in a scale adequately measure the construct. Face validity can be judged after the measure has been developed by potential measurement users (DeVellis, 2012).

2) *Criterion-related validity* refers to the relationship between an instrument and an external criterion. It is the degree to which the instrument uncovers relationships that are in keeping with the theory underlying the construct. For example, in an emotional intelligence test, for people scoring higher, we would predict that they would demonstrate more sensitivity to others' problems, would be able to control their impulses, and to label their emotions more readily than someone who scores lower on a test of emotional intelligence. Evidence of criterion related validity would be demonstrated by the correlation between the test scores and the scores of a criterion performance (Messick, 1993).

Criterion-related validity has two types, including predictive validity and concurrent validity. Predictive validity refers to the correlation between the test scores and the scores of a criterion performance given at a later date. For example, one might theorize that a measure of math ability should be able to predict how well a person will do in an engineering-based profession. Concurrent validity refers to the correlation between the test scores and the scores of a criterion performance when both tests are given at the same time. For example, if we want to assess the concurrent validity of an emotional intelligence test, we would have to correlate emotional intelligence test scores and current performance evaluations. If the correlation is high and positive, this would provide evidence of concurrent validity.

The difference between predictive and concurrent validity is the difference in the timing of obtaining measurement on a criterion.

3) *Construct validity* refers to the degree to which inferences can legitimately be made from the operationalization in the study to the theoretical constructs on which those operationalization were based. It refers to the measure capturing the major dimensions of the concept under study (Polit and Beck, 2012). The key construct validity questions are “What is this instrument really measuring?” and “Does it adequately measure the abstract concept of interest?” For example, the goal might be to measure emotional intelligence. To answer what degree is our questionnaire measuring the theoretical construct of emotional intelligence will demonstrate the construct validity of the instrument.

- *The Multi trait-Multimethod Matrix* is an approach to assess the construct validity of a set of measures. This procedure involves two types of subcategories of construct validity, including convergent validity and discriminant validity. In convergent validity, we examine the degree to which the operationalization is similar to another operationalization in that it theoretically should be similar. For example, to show the convergent validity of a test of arithmetic skills, we may correlate the scores on our test with scores on other tests that imply basic math ability, where high correlations would be evidence of convergent validity. In discriminant validity, we examine the degree to which the operationalization is not similar to other operationalization that it theoretically should be not be similar to. For example, to show the discriminant validity of the test of arithmetic skills, we may correlate the scores on our test with scores on tests that of verbal ability, where low correlations would be evidence of discriminant validity.

- *Factor analysis*, another approach to construct validation is factor analysis. Factor analysis is an important statistical tool to provide validity evidence concerning the structure of instruments. Factor analysis is a method to identify clusters of related variables. Each cluster, called a factor, will represent a relatively unitary attribute. Factor analysis can validate both one-dimensional and multidimensional scales. For a one-dimensional scale, it can be applied to explore possible sub-dimensions within the group of items selected. For multidimensional scales, factor analysis can be used to verify that the items empirically form the intended subscales. There are two basic types of factor analysis used for scale development, including exploratory and confirmatory factor analysis. Exploratory factor analysis (EFA) seeks to reveal the underlying structure of a relatively large set of variables. There is no prior theory and one uses factor loadings to intuit the factor structure of the data. Confirmatory factor analysis (CFA) seeks to determine if the number of factors and the loadings of measured variables in them conform to what is expected on the basis of pre-established theory.

The factor analysis has the following steps:

Step 1: Defines research problems. The researchers should define clear research problem, as well as review related theories and collect data. There are two methods of factor analysis, that is, Exploratory factor analysis (EFA) and Confirmatory factor analysis (CFA) (J.W. Osborne and Fitzpatrick, 2012).

Step 2: Examines data to analyze to verify its consistency with Assumptions of factor analysis statistics. Correlation matrix is constructed by considering Identity matrix with test statistics. Bartlett's test sphericity is also calculated by considering statistical significance at less than or equal with 0.05

( $p \leq 0.05$ ), which indicates that the correlation matrix of the population is not an identity matrix and is, therefore, suitable for factor analysis. The Kaiser-Mayer-Olkin (KMO) is an index to compare size of noticeable correlation coefficient. The most suitable value is the KMO that is close to 1. The value that is less than 0.5 is unacceptable for factor analysis. Communality is an index that indicates linear relationship between the variable and other variables. The communality is in a range of 0-1. The value of 0 indicates the co-component could not explain the variance. The value that could use in factor analysis must be more than 0.2 (Pett, Lackey, & Sullivan, 2003).

Step 3: Extracts components to find numbers of components that could use instead of all variables. There are two component extraction methods. The first method is Principal Component Analysis (PCA) that uses linear relationship principle between variables used as data. The major component of variable is a Linear Combination of that variable that could mostly explain variance of data. Then, find the second combination that could second-mostly explain variance, without relating to the first combination. Do this repeatedly until getting a major component that could completely explain variance of all variables. The major component will be able to explain less and less variance and every component does not relate to each other. The second method is Common factor analysis which consists of five methods: Unweighted Least Square, Generalized Least Square, Maximum Likelihood Method, Alpha Method, and Image Method

Step 4: Factor rotation could be done in two ways. The first is Orthogonal rotation which rotates the core by keeping the component core perpendicular to each other, indicating freedom among components. There are three

ways of orthogonal rotation: Varimax, Quartimax, and Equamax. The second is Oblique Rotation which rotates the core by making the factor core rotates from the old position in sharp angle and non-perpendicular all through the rotation. This type of rotation could identify level of relationship between factors by specifying degree of sharp angle from 0 to 90. Specify low degree if the gained factors are to be highly related. Specify high degree if to gain factors are to be lowly related (Pett et al., 2003).

Step 5: Chooses Factor loading in order to determine which variable belongs to which component by considering weight, using a criteria of component weight more than 0.3.

Step 6: Names components to be analyzed by considering similarity between variables in the component. Names of components should be short, concise, and consistent in meanings between variables in the components that are studied theoretically. Or, new names could be given to be consistent with the researchers' concept.

Two major threats to test validity include construct under-representation and construct irrelevant variance (Messick, 1993). Construct under-representation refers to the tasks which are measured in the assessment fail to include important dimensions or facets of the construct. Construct-irrelevant variance means that a scale measures too many variables, many of which are irrelevant to the interpreted construct. Construct-irrelevant variance can take two forms, including construct-irrelevant easiness, and construct-irrelevant difficulty. The former occurs when extraneous clues in items permit some participants to respond correctly or appropriately in ways that are irrelevant to the construct being assessed. The latter

occurs when extraneous aspects of the task make the task irrelevant variance causes participants to score higher than one would under normal circumstances, so it causes a lower score.

*2.1.2 Reliability* involves the consistency or repeatability of measurements made with the instrument. The reliability is concerned with the portion of measurement that is due to permanent effects persisting from sample to sample. Reliability can be assessed in various ways that depend on the nature of the instrument and the aspect of the reliability of the concept of greatest concern. Three important aspects are internal consistency, equivalence, and stability (DeVellis, 2012; Polit and Beck, 2012).

1) *Internal consistency* is the basic and popular approach to reliability as well. Internal consistency or homogeneity demonstrates the correlation of various items within the instrument. It used to assess item interrelatedness. It is related to the degree to which set of items designed of measure the same concept are inter-correlated. The original approach to determining homogeneity was split-half reliability. This approach required only one full-length test administration and then divided the total number of items into two halves. The correlation between the two halves provided an estimate of the reliability of all of the items (Burns, 2011; Polit and Beck, 2012). Waltz and colleague (2005) explained that internal consistency is most frequently employed for cognitive measures when the concern is with the consistency of performance of one group of individuals across the items on a single measure. The alpha value should be at least .70 to indicate sufficient internal consistency in a new tool.

2) *Equivalence* involves two different forms of an instrument to measure the same concept including parallel and inter-rater reliability. In this form of reliability, one is attempting to determine whether there will be consistent performance on two different forms of a measure by the same subject during one specific testing period. The two different measures are considered alternative or parallel forms using two characteristics including the same objective procedure and being based on the same conceptual definition. The parallel forms consist of one set of items that has been divided randomly into two subsets that make up the two parallel forms (DeVellis, 2012). Inter-rater form of equivalence refers to the comparison of two or more trained observers watching an event simultaneously and scoring it independently, using the protocol developed for the study on two occasions (Burns, 2011; Polit and Beck, 2012). The data can be used to calculate an index of equivalence or agreement between observers. The statistical analysis is needed to calculate coefficient alpha for more than two raters. The inter-rater reliability value should be .90 or higher (Burns, 2011). The correlation between the two halves provided an estimated of the reliability of all of the items. Waltz and colleague (2005) explained that internal consistency is most frequently employed for cognitive measures when the concern is with the consistency of performance of one group of individual across the items on a single measure.

3) *Stability* is concerned with the consistency of repeated measures of the same attribute with the use of the same scale or instrument. Assessments of an instrument's stability involve two procedures that are evaluated including test-retest reliability and inter-rater reliability. The comparison is performed objectively using the correlation coefficient. The possible values for correlation

coefficient range from -1 through .00 to +1.00 (Polit and Beck, 2012). The high correlation coefficient indicates high stability of measurement by the instrument (Burns, 2011). Test-retest time interval should be greater than a two-week period. Burns (2011) recommend a period of two weeks to one month between the two testing times. The test-retest method is appropriate to determine the reliability of a measure when the concept being tested is stable over the time period.

### 2.2 Step 8: Constructs the final scale

Constructs the final scale which should consist of three components: how to use instrument, set of question items, and how to calculate score and evaluation (Waltz et al., 2010). The first component of how to use the instrument includes explanation of things to measured, persons who measure, persons who are respondents, and persons who use results of the study. The second component of question item set consists of question items and measurement pattern that is suitable to the objectives and has suitable properties for the measurement. The third component of translation of measurement results a step that must be conducted in order to use the instrument efficiently.

In conclusion, from literature review, the instrumental construction process comprises of two phases. The first phase of instrumental construction begins by defining objectives and concepts, writing question items, specifying pattern of the instrument, considering consistency of question items by experts, considering content validity of question items, and testing the instrument in a trial. The second phase deals with evaluating quality of the instrument by testing structural validity and confidence of question items until getting the final complete instrument and users' manual.



## **CHAPTER III**

### **METHODOLOGY**

This instrumental development study aims to develop a new tool; that is, a Thai-version of Supportive Care Needs Scale for Thai women with breast cancer undergoing chemotherapy (SCNS-TBC). This chapter divides presentation into two parts. The first part describes methodology used in this instrumental development study, including overall research design, setting and time frame, as well as population and sample, which will be presented briefly in the first part.

The second part presents details of instrumental development process in two sections: scale construction and psychometric properties testing, which consists of eight steps of instrumental development of DeVellis (2012, 2016). Details of scale construction for SCNS-TBC will be explained step-by-step. Procedure, sample group, sampling size calculation, sample right protection, data gathering process, data analysis and results are included in each step. On the other hand, psychometric properties testing process of SCNS-TBC will discuss only the methodology part, particularly procedure, sample group, sampling selection, sampling size calculation, sample right protection, data gathering process, and data analysis. Results of the psychometric properties testing process of SCNS-TBC will be presented in Chapter IV.

#### **Research design**

In this instrumental development study, the researchers conducted both scale construction and psychometric properties testing to develop SCNS-TBC tool

according to the framework of DeVellis (2012, 2016). The process consists of eight steps: 1) determining an operational definition of Supportive Care Needs (SCNs), 2) generating an item pool, 3) determining response format for SCNS-TBC, 4) conducting initial item pool reviewed by experts, 5) considering inclusion of validation items by face validity, 6) considering internal consistency by administering pilot study, 7) identifying the dimensions of SCNS-TBC, and 8) testing psychometric properties of SCNS-TBC (DeVellis, 2012, 2016).

### **Setting and time frame**

Thailand has divided a total of 29 super tertiary cancer care units by its four administrative regions – four units in the northern region, 15 units in the central region, seven units in the north-eastern region, and three units in the southern region (Thai Society of Clinical Oncology, 2018). As this study is an instrumental development process consisting of several steps, hospitals which are source of data are divided according to steps of the instrumental development process. Details are provided in each step in the following sections.

The study was conducted from 7/2016 to 6/2019 according to the following timeline:

- 7/2016: Dissertation proposal approval
- 7/2016 - 12/2016: Literature review
- 1/2017 - 3/2018: Conducting for scale construction
- 4/2018 - 8/2018: IRB approval from nine hospitals
- 5/2018 - 3/2019: Conducting for psychometric properties testing
- 4/2019 - 6/2019: Data analysis and final report

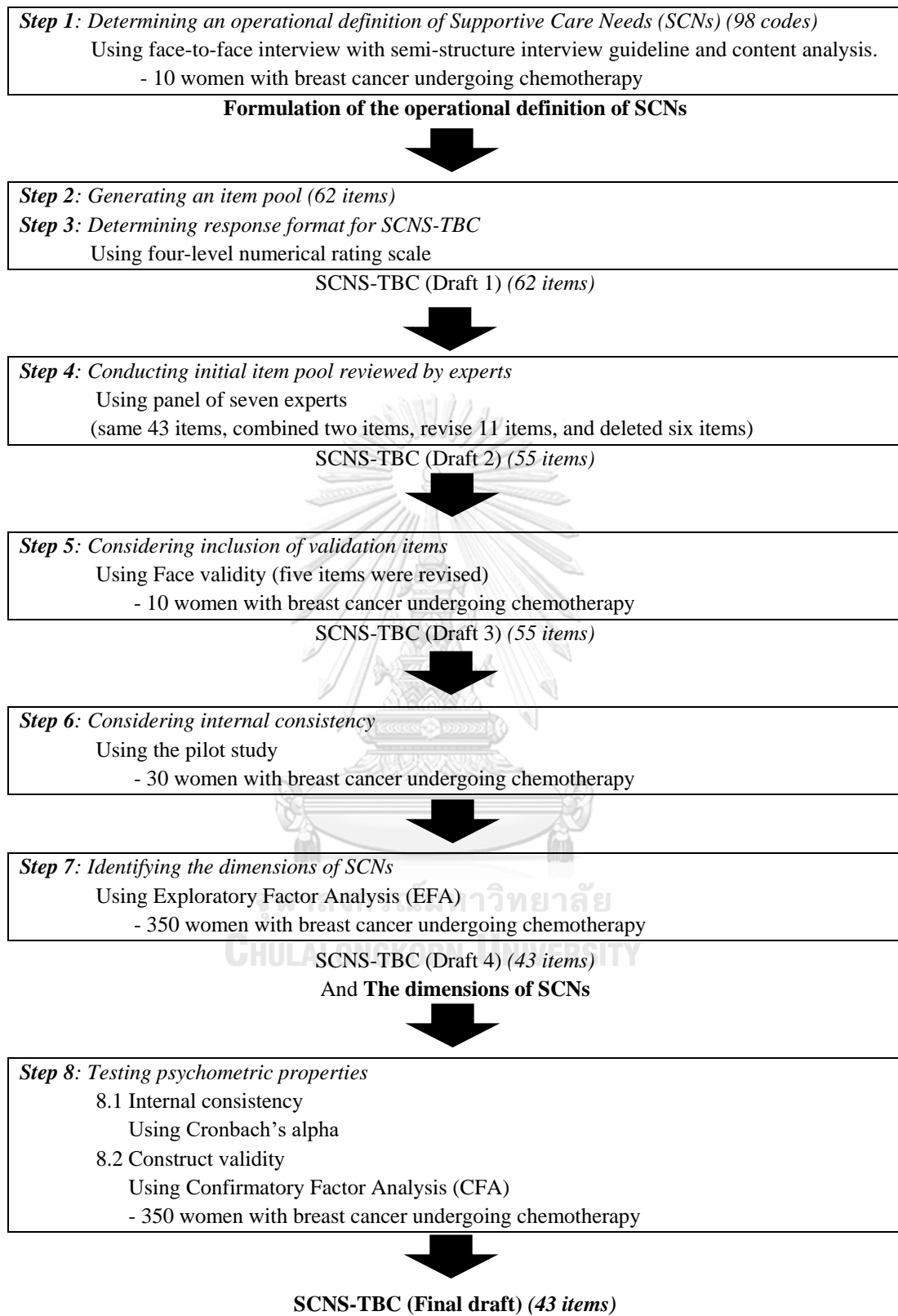
## **Population and sample**

*Population:* Population in this study are Thai women with breast cancer who are undergoing chemotherapy at super tertiary cancer care units in Thailand.

*Sample:* Since this is an instrumental development study consisting of eight steps, samples in this study were Thai women with breast cancer undergoing chemotherapy from the super tertiary cancer care units in Thailand. Sample groups in each step are different from each other. Details of samples, selection criteria, sampling technique, and sample size will be explained later by steps of instrumental development process.

## **Instrument development process of Supportive Care Needs Scale for Thai women with breast cancer undergoing chemotherapy (SCNS-TBC)**

The SCNS-TBC instrumental development in this study divided its process into consecutive steps, as shown in Figure 1. Each step has different objective and procedure. Thus, for continuity in the presentation of SCNS-TBC instrumental development process, the researchers had divided presentation into two sections: scale construction and psychometric properties testing covered eight steps: 1) determining an operational definition of SCNs, 2) generating an item pool, 3) determining response format for SCNS-TBC, 4) conducting initial item pool reviewed by experts, 5) considering inclusion of validation items by face validity, 6) considering internal consistency by administering pilot study, 7) identifying the dimensions of SCNS-TBC, and 8) testing psychometric properties of SCNS-TBC (DeVellis, 2012, 2016). Details of each step are explained in the following sections.



**Figure 1** Process of developing the Supportive Care Needs Scale for Thai women with breast cancer undergoing chemotherapy (SCNS-TBC)

## Section I Scale construction

Scale construction of this study consist of six step: 1) determining an operational definition of SCNs, 2) generating an item pool, 3) determining response format for SCNS-TBC, 4) conducting initial item pool reviewed by experts, 5) considering inclusion of validation items by face validity, 6) considering internal consistency by administering pilot study as follow:

### *Step 1: Determining an operational definition of Supportive Care Needs (SCNs)*

The objective of this step is to search for, understand and define the operational definition and important attributes/characteristics of SCNs of Thai women with breast cancer undergoing chemotherapy in order to use as a framework for creating question items in the following step.

Although at present “*Supportive Care Needs*” is a concept that nursing researchers study widely in order to search for caring approach that responds to the needs of cancer patients (Fitch et al., 2008), “*Needs*” is still highly subjectively-perceived. Thus, its definitions and attributes varies according to several factors, especially in a context where differences in culture and perception influence differences in thought, belief and needs (Fischer et al., 2014; Lam et al., 2011). Thus, a search for and an understanding of “*Supportive Care Needs*” in this study focus mainly on “*Needs*” that are specific supportive care needs of Thai women with breast cancer undergoing chemotherapy. So, it is necessary to study by Emic view (Markee, 2013) which emphasizes on interpreting or getting meaning from viewpoints of informants in real situation, in order to make the researchers truly understand about SCNs of this group of population.

In literature review, the researchers reviewed both SCNs concept and supportive care needs scale constructed and developed through viewpoint of service providers in order to develop a Supportive Care Framework (SCF) for use as guidelines in caring for cancer patients (Fitch et al., 2008) (details provided in Chapter II). It is found that the definition and attributes of SCNs constructed from problems of general cancer patients in Western countries contain some main issues which are significant and may occur with all types of cancer patients. In fact, however, there are still many hidden problems from specificity of cancer organs, including context and other individual factors that affect differences in types and level of supportive care needs. It is necessary that health care team should truly understand these details before making a supportive care plan for this specific group of patients.

Furthermore, it is also found that there is no report about definition and important characteristics of SCNs that bases on direct perception and viewpoint of patients as emic view, particularly of Thai women with breast cancer undergoing chemotherapy whose specificity of disease and treatment process are different from other groups of cancer patient. Thus, in this step, the researchers had to search for and get true understanding about important attributes of SCNs for Thai women with breast cancer undergoing chemotherapy with inductive approach (bottom-up approach) that study by moving from specific to general (Soiferman, 2010) through face-to-face interview in Thai language, using semi-structure interview guideline. The interviews were recorded, then transcribed, and data were analyzed using content analysis.

#### Participants

*Selection Criteria:* Participants in this study were women with breast cancer who were undergoing chemotherapy in super tertiary cancer care hospitals in

the lower northern region of Thailand (Buddhachinaraj Phitsanulok Hospital). Criteria for selection of participants were; 1) ages 20 years old and over; 2) diagnosed for invasive or advanced invasive breast cancer; 3) undergoing any cycle of first-line chemotherapy; and 4) willing to participate in this study.

As this step concerns with getting operational definition and attributes of SCNs for use as a framework for writing question items in the flowing step, the researchers specifically select as source of data from a total of 29 super tertiary cancer care hospitals in Thailand. This is because Buddhachinaraj Phitsanulok Hospital is a center-level hospital with an excellent center in cancer patient care. It has a breast clinic to take care of breast cancer patient in lower northern region, covering population in five provinces – Phitsanulok, Tak, Sukhothai, Uttaradit, and Phetchabun – whose areas are connected to Phitsanulok and to some provinces in northeastern region. Moreover, since Phitsanulok is in lower northern region, its terrain is similar to central region. Hence, population in this area has a distributed culture of northern, northeastern and central region (except southern). Thus, they are good representatives of data in this step. For these reasons, the researchers choose Buddhachinaraj Phitsanulok Hospital as source of data for this step.

*Sampling technique:* Participants were selected through purposive sampling method (Etikan, Musa, & Alkassim, 2016) according to selection criteria. The researchers chose participants with specified inclusion criteria, together with individual recommendation by nurses who work at chemotherapy ward/ department as having suitable profile, providing variety of data, willing to participate, and being able to transfer data about their needs.

*Sample size:* Normally, number of participant in a qualitative method is not definitely determined or depended on size of sample group. Instead, the importance of sample size relies mostly on objectives of the study and saturation of data gained from participants (Mason, 2010). Rather than number of participant, the unit of study for qualitative data is the narrative data itself. Hence, number of participants in this step was set at 10 persons.

#### Instrument

Since this step aimed mainly at finding “*Supportive Care Needs*” of Thai women with breast cancer undergoing chemotherapy from viewpoint of women who had direct experience, a semi-structure interview guideline consisting of open-ended Thai-version questions was developed to ask about issues or problems and significant and necessary needs that should be gained from others, both health care team and family. Two main questions were “***During chemotherapy treatment from the beginning until now, what problems or necessity do you need assistance?***” (“ในช่วงเวลาที่คุณรับการรักษาด้วยยาเคมีบำบัดที่ผ่านมจนถึงตอนนี้ คุณมีปัญหาหรือเรื่องจำเป็นอะไรบ้างที่ต้องการให้ช่วยเหลือ”) and “***What kind of help did you need?***” (“สิ่งที่ต้องการให้ช่วยเหลือคืออะไร?”).

After the participants answered the main questions, additional questions according to participants’ previous responses were used to get in-depth answers. Deep or probes questions were also used to help participant elaborated, for example, “***Can you explain more for this point? .... What do you really mean?***” (“ช่วยอธิบายเพิ่มเติมในประเด็นนี้หน่อยค่ะ...ว่าหมายความว่าอย่างไร”), “***Please give me more details?***” (“ช่วยเล่ารายละเอียดเพิ่มเติมหน่อยนะคะ”) or “***What do you really mean by this?***” (“ที่คุณพูดเรื่องนี้คุณหมายถึงอะไรคะ”) These helped to extract meaningful content related to participants’



perception about problems and needs for assistance of Thai women with breast cancer undergoing chemotherapy

#### Ethical consideration

The researchers asked permission from qualified participants who were willing to participate as samples both orally and formally by signing consent form. Anonymity and confidentiality were guaranteed to the participants. Ethical considerations in this study were approved by the Ethical Review Committee of the Faculty of Medicine, the regional hospital of lower northern Thailand (decision No. 080/60) (Appendix F). The researchers explained details of research and interviewing procedures to the participants, as well as protection of sample right. Decision to participate and withdraw from this study during interview had no effect on treatment. Permission to record all the interview also asked when participants agreed to participate in the project by signing in the consent form.

#### Data collection

In this step, data were collected during August to October, 2017, with a consent from research ethical considerations. The researchers explained research procedures and asked permission from related person. The interview was a face-to-face interview. The researchers interviewed all 10 participants one-by-one in Thai language while they were lying down to receive chemotherapy at Chemotherapy Unit of Buddhachinaraj Phitsanulok Hospital. After selecting participants and receiving consent to participate as sample, the researchers explained details and steps of interview, as well as asked for permission to record the interview. Participants were asked to sign consent forms. The interview began by creating rapport through casual conversation about general things and illness history with breast cancer. After that, the

interview went in-depth with main questions and followed by deep or probes questions to encourage participants to tell and explain details of their needs in each aspect.

Duration depended on participants and continuity of the interview. Typically, the interview of one participant lasted 30 -90 minutes with no interference with normal schedule of each participant. After the interview, the researchers would get participants' telephone numbers in order to ask for additional information or additional interview at home or other places convenient to the participant if some issues were still unclear and needed more explanation. Certainly, this depended on convenience and willingness of each participant.

#### Data analysis

The interview of each patient would be transcribed word-by-word into Thai and analyzed with content analysis method consisting of three processes: preparing, organizing, and reporting as recommended by Elo and Kyngas (2008). After transcription, the researchers would repeatedly read the transcript to understand the overall content. After that, data of needs would be extracted as words or sentences expressing each dimension of SCNs according to participants' speech (coding). Next, words or sentences with same or similar meaning would be sorted into the same group. These steps were repeated for all participants.

After that, the researchers counted frequency of words or sentences with same or similar meaning in each group and categorized into initial themes. The themes were then extracted and refined to be more comprehensive. Lastly, themes were categorized and labeled to represent the cluster of codes that accurately described characteristics of SCNs of Thai women with breast cancer undergoing

chemotherapy (Elo and Kyngäs, 2008; Vaismoradi, Turunen, & Bondas, 2013). During content analysis, data in all transcripts would be checked by both advisor and co-adviser.

#### Trustworthiness

Since this step concerns with qualitative data gathering process through in-depth interview, trustworthiness is given importance in every step. The trustworthiness of qualitative content analysis is often presented by using terms such as credibility, dependability, conformability, transferability, and authenticity (Elo et al., 2014; Elo and Kyngäs, 2008; Lincoln and Guba, 1985; Vaismoradi et al., 2013). The trustworthiness of this study was a major consideration and the researchers employed strategies to improve each of the components identified by Lincoln and Guba (1985) in the research design.

Selection of the most appropriate method of data collection is essential for ensuring the credibility, dependability, and transferability of content analysis (Graneheim and Lundman, 2004). Individual interviews from ten participants with semi-structured guideline was used in this study. Participants were asked similar questions because they met the inclusion criteria in order to systematically ascertain common themes. In addition to meeting inclusion criteria, participants were recommended to the researchers by the oncology nurses who suggested these participants represented diverse patient (e.g. differing family and living situations), who could articulate their various needs. Moreover, all participants had direct experience with breast cancer patients and were involved in chemotherapy during the time of the interviews.

There is no commonly accepted sample size for qualitative studies because the optimal sample depends on the purpose of the study, research questions, and richness of data (Burmeister and Aitken, 2012). Rather than number of participants, the unit of study for qualitative data is the narrative data itself. In this study, it was found that, after the first interview of five participants, it was necessary to make additional interview to probe for issues of unclear problems and supportive care needs. Therefore, five participants were interviewed more than once. Two from five participants were interviewed two times and three from five participants were interview three times to confirm and add more details until the data was clarified, verified, and rich enough. In the second and third re-interview with five participants, the researchers made the interviews at home through phone appointment, after receiving permission and consent form all participants. So, this study conducted a total of 18 interviews with 10 participants until data about supportive care needs were sufficiently clear and rich. Furthermore, the return to participants to clarify and deepen the data also allowed for member checking validation of “prolonged engagement” and “persistent observation” (p.301) suggested by Lincoln and Guba (1985) as an aid to credibility. This validation process supports the notion that the researchers and analytic team truly understand the data.

Moreover, credibility of the analysis could be confirmed by member checking for representativeness of the data as a whole (Thomas and Magilvy, 2011). In this study, results were presented to women with the same experiences who validated that the findings echoed their experiences. In addition, the researcher kept returning to the data to check whether the interpretation was true to the data and features identified (Sandelowski and Leeman, 2012). Because the findings must

reflect the participants' voice and not the researcher's biases, motivations, or perspectives, the primary researcher spent time before interviews to identify her own biases and thoughts.

In addition, during data collection and analysis, the researcher sought input from research mentors; both advisor and co-adviser, to help with identifying bias. In an effort to assure trustworthiness of the findings in this study, the researcher also engaged in critical evaluation in relation to procedures used to generate the findings (Graneheim and Lundman, 2004). Finally, the quotations were initially recorded and transcribed in Thai. In order to check for reliability of the translations to English for presentation in this dissertation, the quoted translations were validated by two bilingual colleagues (Appendix D).

## Results

*Context:* The context for Thai women with breast cancer undergoing chemotherapy in this interview is a group of women with breast cancer undergoing chemotherapy at chemotherapy unit. Normally, this group was treated at out-patient department (OPD). For the treatment, the patients come in advance to draw blood in order to assess their readiness before receiving chemotherapy. After blood drawing, the patients go home to wait for results and return to meet their doctor in the morning of the appointment date. In case that the patients live far away from the hospital where they will get chemotherapy, they can draw blood at nearby hospital and bring their blood test results on the day of chemotherapy. After seeing their doctor, if their blood test result pass and they are ready to receive chemotherapy, they can undergo chemotherapy at the chemotherapy department which usually takes about four to five hours per person. Then, the patients will be discharged to rest at home after

chemotherapy and will return to undergo another cycle of chemotherapy in the next 21-28 days (three to four weeks). On the contrary, if their blood test result is abnormal or their physical conditions are not ready for chemotherapy, their appointment will be postponed until their physical conditions are ready for chemotherapy.

*Overview:* This study conducted a total of 18 interviews with 10 participants. Three participants were interviewed 3 times and two participants were interviewed 2 times because certain data from the first and second interview still needed to be explained until it was clear.

All of the participants were Thai female with average age of  $50.1 \pm 6.48$  years, in age range between 39 and 60. Most participants had right breast cancer (60%) and most had been diagnosed with either stage II (50%) or stage III (50%) cancer. Most participants received chemotherapy regimen with a first-line treatment comprised of AC (Adriamycin-Cyclophosphamide) (70%) in Cycle 2 (30%) and 3 (30%) (Table 12).

**Table 12** Background of 10 participants in interview step (N = 10)

|                                     |  | Participants<br>n (%) |
|-------------------------------------|--|-----------------------|
| Age                                 | Mean (SD) = 50.1 (6.48)                          |                       |
| Marriage status                     | Single   | 3 (30)                |
|                                     | Married  | 4 (40)                |
|                                     | Divorced   | 3 (30)                |
| Occupation                          | Government officer                               | 2 (20)                |
|                                     | Contractor                                       | 3 (30)                |
|                                     | Agriculturalist                                  | 3 (30)                |
|                                     | Not working                                      | 2 (20)                |
| Diagnosis                           | Right breast cancer                              | 6 (60)                |
|                                     | Left breast cancer                               | 4 (40)                |
| Stage of breast cancer              | Stage II   | 5 (50)                |
|                                     | Stage III  | 5 (50)                |
| Chemotherapy regimen                | AC (Adriamycin-Cyclophosphamide)                 | 7 (70)                |
|                                     | CMF (Cyclophosphamide-Methotrexate-Fluorouracil) | 3 (30)                |
| Cycle of first-line<br>Chemotherapy | 2 <sup>nd</sup>                                  | 3 (30)                |
|                                     | 3 <sup>rd</sup>                                  | 3 (30)                |
|                                     | 4 <sup>th</sup>                                  | 2 (20)                |
|                                     | 5 <sup>th</sup>                                  | 2 (20)                |

*Supportive Care Needs (SCNs) for Thai women with breast cancer undergoing chemotherapy*

Viewpoints of Thai women with breast cancer undergoing chemotherapy about SCNs were conveyed through answers of main questions and deep or probes questions. The researchers tried to search for perception of problems or situations occurred during chemotherapy treatment that made participants needed assistance from others, including things needed for facing with disease, chemotherapy treatment, and changes happened during that period.

During the interview, participants were asked to recall about their experiences of breast cancer illness and treatment process until chemotherapy, in

order to understand initial perceptions of their own illness and treatment. After that, the researchers began to go in-depth about problems/issues or situations that affected the patients' living and their needs for assistance or support to solve problems occurred during chemotherapy treatment period. The interview process helped participants to review their memory, thought, and perceptions about various events that led to problems and needs for supportive care.

After the interview, records were transcribed in Thai language and the researchers read interview transcription of each participants many times to gain full insight. It was found that most participants could perceive changes occurred after being diagnosed with breast cancer and receiving various treatment process-biopsy, operation, and finally chemotherapy. These changes all affected coping, self-adjustment, and search for assistance from various sources, in order to maintain one's living as normal as possible.

From the interview that the researchers focused on chemotherapy treatment period, it was found that participants reported two kinds of events. One occurred during each chemotherapy treatment at hospital (one day period). The other occurred during recuperation at home three to four weeks after each chemotherapy, while waiting for the next cycle. It could be seen that the period when this group of patients faced many serious problems occurred during recuperation at home after each treatment was much longer than the period when they underwent chemotherapy one day at a time. Furthermore, the day the patients underwent chemotherapy at hospital was normally the day when their physical conditions were stronger than the days when they rested at home after chemotherapy. This is because the adverse effect



period of chemotherapy usually occurred within the first one to two weeks and gradually reduced to near-normal around the next cycle of chemotherapy.

One thing obviously noticeable from the interview is when the researchers probed about important problems of situations that made participants needed help, the participants would feel that they did not want to be a burden for anyone. They were reluctant to ask for help from family, doctor, nurse or others even though these things were necessary for them (Klungrit et al., 2019). Nearly all participants stated that they “felt considerate” and thought that everyone - doctor, nurse, family - did have his or her own duty and they did not want to add to their burden. All participants chose to solve the problems and did everything by themselves as much as possible like they did before illness.

However, when participants were encouraged to express opinion about problems or situations related to SCNs from their direct experience, they were all willing to give all information. Hence, results of this interview after content analysis indicated that SCNs in the phenomena of Thai women with breast cancer undergoing chemotherapy occurred two periods; some needs in early post-chemotherapy recovery at home and some needs each cycle of chemotherapy at hospital. Moreover, there are various types of needs of this group such as; useful information and advices, financial problem-solving, family support etc. as showed the details in Appendix A.

After content analysis of the interview transcripts of 10 Participants for 18 times, the researchers were able to find 207 codes of attributes of SCNs from viewpoints of Thai women with breast cancer undergoing chemotherapy by counting frequency of each code with similar or the same attribute of SCNs. Results of the analysis showed that needs for information about breast cancer and one own treatment

is the code with the highest frequency at 10, followed by explanation about kinds of food that should be eaten and should be avoided at frequency of seven. Other codes were around two to five (80 codes were at two, two codes were at three, two codes were at four, one code was at five) while 11 codes were at the lowest frequency of one (Appendix B).

These included needs for information about sexual relationship, side effect of chemotherapy on sexual relationship, guidelines for using the arm on the operated side, guidelines for behavior that would increase platelets, personal advisement, 24-hour consultation service, house-visit by volunteers or nurses from nearby hospitals, conversation with someone with similar experience, support for wigs, supplementary food and career for additional income, and nurses who are expert in injecting veins. It could be seen that, after analyzing repetitive meaning of similar or same attributes of supportive care need, only 98 codes (Appendix B) were left to provide overall and significant attributes for defining the operational definition of SCNs for Thai women with breast cancer undergoing chemotherapy in this study, for use as a framework in generating items in the following step (Appendix C).

*The operational definition of Supportive Care Needs for Thai women with breast cancer undergoing chemotherapy*

SCNs as perceived by Thai women with breast cancer undergoing chemotherapy refer to critical condition of body and mind changes, as well as issues that creates deficiency and guidelines/ methods for solving problems with remedy, assistance and necessary responses from family and health care team while undergoing chemotherapy. This includes the duration from before, while to after undergoing each cycle of chemotherapy which covers care process at hospital and

recovery at home after chemotherapy. SCNs consists of seven aspects of needs to maintain balance in normal living; physical, psychological, useful information, family involvement, health service support, financial problem-solving, and religion (Appendix C).

### ***Step 2: Generating an item pool***

At this step, a large pool of items (98 codes) would be generated to cover the operational definition gained from the first step. Each item was written concisely in Thai but meaningfully to reflect SCNs of Thai women with breast cancer undergoing chemotherapy. All items may be similar, repetitious, or overlapped in meaning. Later, the researchers would choose items that directly reflect the scale's purpose and the latent variable (Supportive Care Needs), in order to make the newly-developed scale clear and valid in measuring the latent variable, which in this study is SCNs.

After that, the researchers reduced redundancy in item pool by checking for repetition of words with similar meaning or items asking the same opinions but using different words. The researchers had to gain deep understanding and reduce repetition in all items. Furthermore, the researchers also had to consider number of items. DeVellis (2012) stated that there was no definite rule about number of item at this stage, but number of item in the final scale should be taken into consideration. At this step of item generation, there should be three to four times more item than needed in the final version (DeVellis, 2012). In this study, there were a total of 62 items (Table 13) that covered seven aspects of needs; physical, psychological, useful information, family involvement, health service support, financial problem-solving, and religion.

Writing question is another important part of this step. The researchers should write questions by paraphrasing from original spoken words in the interview, in order to communicate correspondingly with the scale's purpose and to measure SCNs most directly. In this study, questions were written in Thai, then translated into English for presentation in this dissertation. Back-translation technique (Maneesriwongul and Dixon, 2004) was used to verify by having one bilingual Thai translated Thai questions (original) into English, then having another one bilingual Thai translated the English version back into Thai. After that, the Thai (translated) version was compared with the Thai (original) version until it could be verified that the translated English version were similar in meaning with the Thai (original) version (Appendix D).

DeVellis (2012) suggested that good questions should be direct and clear, and convey only one main idea. Moreover, questions should be written in language understood by sixth-grade readers. Average length of word in each item should be 15-16 words or 20 syllables. Positively and negatively worded items should also be considered. In this study, the researchers began every question with "I" or "I need..." because in answering, the respondents read and answered every question by themselves. So, the respondents would understand that the questions aimed to ask for their opinions and perceptions about their own problems and needs. The questions were sequenced according to series of events, to indicate problems and solutions that each participant's needs occurred, from the duration of chemotherapy at hospital until recovery at home, without classification into aspects. However, the sequence of all items covered seven aspects of needs; physical, psychological, useful information, family involvement, health service support, financial problem-solving, and religion.

**Table 13** The first draft of SCNS-TBC (62 items)

| Thai version (original)  | English version  |
|--|--|
| 1. ฉันรู้สึกกลัวมากที่ต้องถูกแทงเข็ม หรือเจาะเลือดหลายๆ ครั้ง จึงต้องการพยาบาลที่มีความเชี่ยวชาญมากๆ | 1. I am very afraid of being injected or drawn blood many times so I want nurses who are very experienced.                               |
| 2. ฉันไม่ต้องการให้ใครมารบกวน และต้องการนอนพักเงียบๆ ในขณะที่นอนรับยาเคมีบำบัด                       | 2. I do not want anyone to disturb me. I want to rest silently during chemotherapy.  |
| 3. ฉันต้องการอุปกรณ์ที่ช่วยให้ร่างกายอบอุ่นขณะนอนรับยาเคมีบำบัดในห้องแอร์เช่นผ้าห่มผ้าคลุมศีรษะ      | 3. I need something to make me warm while lying down for chemotherapy in air-conditioned room such as sheet to cover my head.            |
| 4. ฉันต้องการอุปกรณ์ที่ช่วยบรรเทาอาการปวดเมื่อยขณะนอนรับยาเคมีบำบัดบนเตียงเช่นหมอนหนุนหลังผ้ารองแขน  | 4. I need something to alleviate stiffness while lying down on bed for chemotherapy such as back-supported pillow or arm-supported sheet |
| 5. ฉันต้องการมีคนพาไปห้องน้ำในระหว่างที่ได้รับยาเคมีบำบัด  | 5. I need someone to assist me to a toilet while undergoing chemotherapy.  |
| 6. ฉันรู้สึกแสบจมูกจากกลิ่นของยาเคมีบำบัดที่ได้รับ   | 6. I feel burning nose from the smell of chemotherapy I get.   |
| 7. ฉันต้องการให้พยาบาลเดินมาซักถามอาการหรือมาดูเป็นระยะๆ ในขณะที่นอนรับยาเคมีบำบัด                   | 7. I need nurses to walk over to ask or inspect me periodically while undergoing chemotherapy.   |
| 8. ฉันต้องการได้รับความช่วยเหลือเกี่ยวกับอาการเจ็บและแสบร้อนบริเวณที่แทงเข็ม                         | 8. I need help about pain and burns at injection site.   |

**Table 13** The first draft of SCNS-TBC (62 items) (Cont.)

| Thai version (original)  | English version   |
|--|---|
| 9. ฉันต้องการให้มีบริการลูกอมหรือน้ำสมุนไพรอุ่นๆเช่นน้ำ<br>ขิงน้ำใบเตยน้ำตะไคร้จิบเพื่อบรรเทาอาการขมค่อน้ำลาย<br>เหนียวในระหว่างที่นอนรับยาเคมีบำบัด | 9. I need some candies or warm herbal<br>drinks such as ginger juice, pandan<br>juice, lime grass juice to relieve bitter<br>taste and viscous saliva while<br>undergoing chemotherapy. |
| 10. ฉันต้องการให้แพทย์พยาบาลพูดคุยกับฉันด้วยถ้อยคำ<br>สุภาพไม่ตำหนิให้รู้สึกไม่สบายใจ  | 10. I need doctors and nurses to speak<br>with me politely with no reprimand to<br>make me worry.   |
| 11. ฉันต้องการกำลังใจจากแพทย์ พยาบาลในการพูดคุยให้<br>กำลังใจ  | 11. I need encouragement speech from<br>doctor and nurses.  |
| 12. ฉันต้องการให้ญาติเข้าไปในห้องตรวจขณะที่พบแพทย์<br>ทุกครั้ง   | 12. I need my cousins to accompany me<br>every time I meet with the doctor.   |
| 13. ฉันต้องการให้ครอบครัวมีส่วนร่วมในการรับฟังข้อมูล<br>และช่วยตัดสินใจเกี่ยวกับการเจ็บป่วยและการรักษาด้วยเคมี<br>บำบัด                              | 13. I need my family to involve in<br>listening to information and make<br>decision about my sickness and<br>chemotherapy treatment.  |
| 14. ฉันต้องการให้ครอบครัวคอยเตือนเกี่ยวกับวันนัดในการ<br>มาตรวจและมารับยาเคมีบำบัดแต่ละครั้ง   | 14. I need my family to warn me about<br>each appointment with doctors and<br>chemotherapy treatment.   |
| 15. ฉันต้องการให้ครอบครัวมารับ-ส่งและอยู่ด้วยในขณะที่<br>ฉันมารับยาเคมีบำบัดที่โรงพยาบาล   | 15. I need my family to accompany me<br>and stay with me while undergoing<br>chemotherapy at the hospital.  |
| 16. ฉันต้องการให้ครอบครัวช่วยเหลือในการยื่นบัตรพาไป<br>เจาะเลือดเอกซเรย์หรือติดต่อที่ต่างๆในวันที่มาตรวจรักษาที่<br>โรงพยาบาล                        | 16. I need my family to help me in<br>submitting appointment card, blood<br>drawing, taking x-ray, or contacting<br>various departments on my treatment<br>day at the hospital.         |
| 17. ฉันต้องการได้รับการเอื้ออำนวยความสะดวกใน<br>ขั้นตอนการเข้ารับการตรวจรักษาในเวลาที่เหมาะสม  | 17. I need facilitation for check-up<br>admittance procedure at appropriate<br>time.  |
| 18. ฉันต้องการให้ครอบครัวให้กำลังใจและอยู่เป็นเพื่อน<br>ขณะมารับยาเคมีบำบัดที่โรงพยาบาล  | 18. I need my family to encourage and<br>accompany me while undergoing<br>chemotherapy at hospital.   |
| 19. ฉันต้องการมารับการตรวจในวันเดียวกันทั้งการมารับยา<br>เคมีบำบัดและการตรวจอื่นๆ  | 19. I want to have check-up on the same<br>day, both chemotherapy and others.   |
| 20. ฉันมีปัญหาเรื่องการเงิน และต้องการรักษาตามสิทธิที่<br>ไม่ต้องเสียค่าใช้จ่าย  | 20. I have money problem and want to<br>be treated according to my right without<br>fee.  |

**Table 13** The first draft of SCNS-TBC (62 items) (Cont.)

| Thai version (original)  | English version  |
|--|--|
| 21. ฉันต้องการได้รับสวัสดิการจากรัฐบาลในการสนับสนุนเรื่องค่าใช้จ่ายอื่นๆในการมารักษาเคมีบำบัดที่โรงพยาบาลเช่น ค่ารถค่าน้ำมันค่าเดินทางค่าที่พักและค่าอาหาร | 21. I need to get government's welfare to support my other expenses concerning chemotherapy treatment at the hospital, such as bus fare, fuel expense, travel expense, accommodation and food expense. |
| 22. ฉันต้องการให้แพทย์/พยาบาลใช้เวลาในการอธิบายและให้คำแนะนำต่างๆ  | 22. I need doctors / nurses to take time to explain and give me suggestions.   |
| 23. ฉันต้องการคำปรึกษาเป็นรายบุคคลมากกว่าการแนะนำเป็นรายกลุ่ม  | 23. I need individual consult rather than group suggestions.   |
| 24. ฉันต้องการให้แพทย์หรือพยาบาลเป็นสื่อกลางในการอธิบายกับคนในครอบครัวเกี่ยวกับสภาพการเจ็บป่วยและการรักษาของฉัน  | 24. I need doctors or nurses to explain to my family about my illness conditions and treatments.   |
| 25. ฉันต้องการให้มีพยาบาลหรือนักโภชนาการให้ความรู้หรือตอบข้อซักถามต่างๆขณะรอพบแพทย์  | 25. I need nurses or nutritionists to give knowledge or answer questions while I wait for the doctor.  |
| 26. ฉันต้องการคำอธิบายจากแพทย์เกี่ยวกับลักษณะ/ชนิด/ระยะและความรุนแรงของโรคมะเร็งเต้านมที่ฉันกำลังเป็นอยู่  | 26. I need explanations from doctors about features / types and severity of my breast cancer.  |
| 27. ฉันต้องการทราบข้อมูลเกี่ยวกับแนวทางการรักษาและระยะเวลาในการรักษาจนกว่าจะหายขาด   | 27. I need to know information about approach and duration of treatment until I'm cured.   |
| 28. ฉันต้องการทราบรายละเอียดค่าใช้จ่ายในการรักษาและแนวทางการใช้สิทธิการรักษาโดยไม่เสียค่าใช้จ่าย   | 28. I need details of treatment expenses and how to use my right to treatment without paying expenses.   |
| 29. ฉันต้องการให้แพทย์บอกความก้าวหน้าของโรคและการรักษาของฉันเป็นระยะๆ  | 29. I need doctors to tell me about the progress of my disease and treatment periodically.   |
| 30. ฉันต้องการข้อมูลเกี่ยวกับทางเลือกอื่นๆในการรักษา นอกจากการรักษาด้วยเคมีบำบัด   | 30. I need information about other treatment alternatives other than chemotherapy.   |
| 31. ฉันต้องการคำชี้แจงเกี่ยวกับการใช้สมุนไพรร่วมกับการรักษาด้วยยาเคมีบำบัด   | 31. I need explanations about using herbs along with chemotherapy.   |
| 32. ฉันต้องการคำแนะนำเกี่ยวกับฤทธิ์ข้างเคียงของยาเคมีบำบัดที่มีผลต่อร่างกาย  | 32. I need suggestions about side effects of chemotherapy on my body.  |

**Table 13** The first draft of SCNS-TBC (62 items) (Cont.)

| Thai version (original)   | English version   |
|---|---|
| 33. ฉันต้องการคำอธิบายเกี่ยวกับการตรวจเลือดก่อนการรับยาเคมีบำบัดได้แก่การตรวจเม็ดเลือดขาวเกล็ดเลือด   | 33. I need explanations about blood test before chemotherapy, i.e. white blood and platelets test.                                    |
| 34. ฉันต้องการคำแนะนำเรื่องการปฏิบัติตัวที่ส่งเสริมให้ผลตรวจเลือดมีค่าปกติและสามารถรับยาเคมีบำบัดได้อย่างต่อเนื่อง                                | 34. I need suggestions about behaviors that will make my blood test normal and enable me to endure continuous chemotherapy.           |
| 35. ฉันต้องการคำแนะนำการปฏิบัติตัวเพื่อช่วยให้ตนเองหายจากโรคมะเร็งเต้านมที่กำลังเป็นอยู่  | 35. I need suggestions on behaviors that will help me cured from my breast cancer.  |
| 36. ฉันต้องการข้อมูลเกี่ยวกับกิจกรรมต่างๆและงานที่สามารถทำได้ในช่วงที่เจ็บป่วยและรักษาด้วยยาเคมีบำบัด   | 36. I need information about activities and works I can do during my sickness and chemotherapy treatment.                             |
| 37. ฉันต้องการคำแนะนำเกี่ยวกับข้อปฏิบัติในการใช้แขนข้างที่เป็นมะเร็งเต้านมในการทำกิจกรรมต่างๆ   | 37. I need suggestions about guidelines in using my arm on the breast cancer side in doing various activities.                        |
| 38. ฉันต้องการคำแนะนำเกี่ยวกับชนิดของอาหารที่ควรรับประทานและอาหารที่ควรหลีกเลี่ยง   | 38. I need suggestions about types of food to take and types of food to avoid.  |
| 39. ฉันต้องการคำแนะนำเรื่องทางเลือกและอาหารทดแทนเฉพาะรายบุคคลเช่นอาหารเสริมหรือวิตามินต่างๆ   | 39. I need suggestions about individual alternatives and replacing food, such as supplementary or vitamins.                           |
| 40. ฉันต้องการพูดคุยเพื่อแลกเปลี่ยนประสบการณ์ของตัวเองกับคนที่ป่วยและอยู่ในภาวะเดียวกัน   | 40. I need to talk to exchange my experiences with other patients in the same conditions.   |
| 41. ฉันต้องการการบรรเทาอาการคลื่นไส้อาเจียนหลังจากได้รับยาเคมีบำบัด   | 41. I need to relieve my nausea after chemotherapy treatment.   |
| 42. ฉันมีอาการนอนไม่หลับและต้องการได้รับความช่วยเหลือ   | 42. I cannot sleep and I need assistance about this.  |
| 43. ฉันต้องการให้พยาบาลที่โรงพยาบาลใกล้บ้านมาเยี่ยมที่บ้านในช่วง2-3 วันหลังกลับจากรับยาเคมีบำบัดแต่ละครั้ง  | 43. I need nurse from the nearby hospital to visit me at my home in 2-3 days after each chemotherapy treatment.                       |
| 44. ฉันต้องการให้ครอบครัวจัดเตรียมอาหารที่ฉันสามารถรับประทานได้ในช่วงเวลาที่ฉันรู้สึกเบื่ออาหาร   | 44. I need my family to prepare food I can eat when I lose my appetite.   |
| 45. ฉันต้องการให้ครอบครัวจัดหาอาหารหรือผลไม้ที่มีรสชาติอมเปรี้ยวที่ช่วยบรรเทาอาการคลื่นไส้อาเจียนเช่นอาหารประเภทต้มยำผลไม้จำพวกส้มมะม่วงมะขามคลุก | 45. I need my family to provide me sour food or fruit to alleviate nausea such as Tom-Yum, orange, mango, tamarind or mixed tamarind. |



**Table 13** The first draft of SCNS-TBC (62 items) (Cont.)

| Thai version (original)  | English version  |
|--|--|
| 46. ฉันต้องการให้ครอบครัวจัดหาอาหารมังสวิริคิให้รับประทาน  | 46. I need my family to provide vegetarian food for me.  |
| 47. ฉันต้องการให้คนในครอบครัวทำงานบ้านแทนในช่วงเวลาที่ฉันอ่อนเพลียมาก  | 47. I need my family member to do housework for me during the time I feel very tired.  |
| 48. ฉันต้องการให้คนในครอบครัวติดต่อทำธุระแทนในช่วงเวลาที่ฉันไม่สามารถออกไปไหนได้                                       | 48. I need my family member to run errand for me during the time I cannot go out.  |
| 49. ฉันต้องการให้คนรัก/สามีเข้าใจในเรื่องการมีเพศสัมพันธ์ที่ฉันไม่สามารถตอบสนองได้เหมือนเดิม                           | 49. I want my boyfriend/husband to understand that I cannot respond to sexual relationship as before.  |
| 50. ฉันรู้สึกเครียดและวิตกกังวลกับการเจ็บป่วยและการรักษาครั้งนี้ฉันต้องการความช่วยเหลือจากแพทย์และพยาบาล               | 50. I feel so anxious and worried with my sickness and treatment that I need help from doctors and nurses.   |
| 51. ฉันยังทำใจยอมรับการเจ็บป่วยและการรักษาไม่ได้และต้องการกำลังใจจากครอบครัว   | 51. I still cannot accept my sickness and treatment and need encouragement from my family.   |
| 52. ฉันกังวลกับสภาพร่างกายที่เปลี่ยนแปลงไปเช่นผมร่วง ปากดำ เล็บดำ และผิวหนังดำเนื่องจากฤทธิ์ข้างเคียงของยาเคมีบำบัด    | 52. I am worried about my changing physical condition such as fallen hair, darkened lips, blackened nails, and darkened skin due to side effect of chemotherapy. |
| 53. ฉันต้องการให้คนในครอบครัวพูดจากับฉันดีๆ ไม่ใช่คำพูดที่ทำให้คิดมากหรือรู้สึกน้อยใจ                                  | 53. I need my family to speak with me sweetly and does not use words that will make me feel frustrated or hurt.  |
| 54. ฉันต้องการให้ครอบครัวเอาใจใส่ดูแลเป็นพิเศษในช่วงสัปดาห์แรกหลังรับยาเคมีบำบัด                                       | 54. I need my family to specially take care of me during the first week after chemotherapy.  |
| 55. ฉันต้องการให้คนในครอบครัวยอมรับกับสภาพร่างกายของฉันที่เปลี่ยนแปลงจากความเจ็บป่วยและการรักษาโดยไม่แสดงท่าทีรังเกียจ | 55. I need my family to accept my body condition that changes from sickness and treatment without any dislike or embarrassment.                                  |
| 56. ฉันต้องการให้คนในครอบครัวโทรศัพท์มาหาบ้าง  | 56. I need my family members to call me.   |
| 57. ฉันต้องการให้ครอบครัวพาไปทำบุญทำทานสร้างกุศลให้มีกำลังใจมากขึ้น  | 57. I need my family to bring me to make merit, donate and do good deeds to encourage me.  |

**Table 13** The first draft of SCNS-TBC (62 items) (Cont.)

| Thai version (original)  | English version  |
|--|--|
| 58. ฉันต้องการได้รับการสนับสนุนวิกผมหมวกผ้าโพกศีรษะจากโรงพยาบาล                              | 58. I need support for wigs, hats, and turbans from the hospital.                  |
| 59. ฉันต้องการได้รับการสนับสนุนจากโรงพยาบาลเรื่องอาหารเสริมที่ไม่สามารถซื้อรับประทานเองได้   | 59. I need support for supplementary food that I cannot afford from the hospital.  |
| 60. ฉันต้องการหารายได้เพิ่มเติมเพื่อแก้ปัญหาการขาดสรเรื่องการเงิน                            | 60. I want to get additional income to solve money problem.                        |
| 61. ฉันมีความจำเป็นต้องขอยืมเงินจากญาติพี่น้อง   | 61. I have to borrow money from my cousins.  |
| 62. ฉันต้องการการบริการให้คำปรึกษาทางโทรศัพท์24 ชม. เมื่อเกิดปัญหาหรือข้อสงสัยขณะอยู่ที่บ้าน | 62. I need 24-hour phone consult when I have problems or doubts while I stay home. |

### *Step 3: Determining response format for SCNS-TBC*

In this study, the researchers determined format of measurement together with item pool generation in step 2, in order to gain more suitability and consistency between items and response format, both for stem and series of response options. Apart from response format, suitability in number of options in the format should be considered as well. Options should be able to differentiate and express exact meaning of respondents.

The response format chosen for this study was a four-level numerical rating scale - a rating scale on degree or extend (Svensson, 2001; Wetzel and Greiff, 2018) substituted by numbers (Numerical Rating scaling). Numerical rating scaling is as widely popular as Likert scaling used to assess feeling, opinions, beliefs, and attitudes. The only difference is in a series of response options where Numerical Rating scaling employs one dimensional measurement ranging from the lowest to the highest or the highest to the lowest, representing by numbers. On the other hand,

Likert scaling uses measurement options of opposite dimensions, such as “strongly disagree”, “moderately disagree”, “mildly disagree”, “mildly agree”, “moderately agree” and “strongly agree” (DeVellis, 2012; Wetzell and Greiff, 2018).

Furthermore, consideration for channel of measurement or number of option is also important. Division into odd (3, 5, 7..) or even (2, 4, 6..) number depends mainly on the objectives of each scale. In this instrumental development study, assessment is focused on level of significance and necessity of each SCNs that patients think is significant and necessary to gain assistance from the lowest to the highest level. The researchers chose to divide level of significance and necessity into four-levels: 1- the lowest level of significance and necessity to gain assistance; 2- low level of significance and necessity to gain assistance; 3- high level of significance and necessity to gain assistance; and 4- the highest level of significance and necessity to gain assistance. It could be seen that there was no moderate level in this four-level division. Thus, this kind of division helps to reduce some problems with regular rating scales, such as ambiguity of rating scale labels in a moderate level (Wetzell and Greiff, 2018). However, it is challenging to construct because identification of level of significance and necessity of assistance need to capture different traits between low and high levels. Therefore, the response format of this scale has no option for moderate level of significance and necessity.

The response format of SCNS-TBC is a four-level numerical rating scale in which the respondents assess level of significance and necessity of assistance need from the lowest to the highest with no moderate level. In translating results of this questionnaire, the researchers translated results of level of significance and necessity of assistance needs by Intervals from the range (Wetzell and Greiff, 2018). There was

a regrouping from four levels into three levels: low-moderate-high, by subtracting the highest value with the lowest value and dividing by numbers of needed intervals. Therefore, level of significance and necessity of assistance need from this SCNS-TBC was translated into  $(4 - 1)/3$  which yielded a range of 1. This means that the range of 1.00 – 2.00 is a low level, 2.01 – 3.00 is a moderate level, and 3.01 – 4.00 is a high level of significance and necessity to gain assistance. This clearly indicates difference needs of supportive care in three levels from low-moderate-high. This translated results could be used to consider suitable responses to SCNs.

Moreover, the researchers had designed the SCNS-TBC to have two parts. Part one evaluates SCNs with all question items and Part two asks personal information of respondents. This way, the respondents will have more attention and concentration in answering each question item since the beginning of the questionnaire.

Direction of the questionnaire gives explanation to make respondents understand purposes of this scale. The aim is to make respondents contemplate each question item and decide if the question indicates significant and necessary problem or solution that the respondents need to gain during breast cancer treatment with chemotherapy. Scales of significance and necessity are divided into four levels, from the lowest to the highest, signifying by numbers 1-4. The respondents answer by circling the most relevant number, as shown in Figure 2.

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**Direction:**

The following questions ask information about supportive care need of Thai women with breast cancer undergoing chemotherapy.

Please read each question and consider if that question indicates problem or solution that are significant and necessary for you in different levels.

Please read each question one by one and circle ○ around number 1 - 4 which is the most relevant to your true need.

- 1 refers to problem or solution that is significant and necessary for you at the lowest level
- 2 refers to problem or solution that is significant and necessary for you at low level
- 3 refers to problem or solution that is significant and necessary for you at high level
- 4 refers to problem or solution that is significant and necessary for you at the highest level

| <i><b>During chemotherapy treatment...</b></i><br><i>which level is the following problem or solution significant and necessary for you?</i> | Level of significance and Necessity |     |      |         |
|--|-------------------------------------|-----|------|---------|
|  | Lowest                              | Low | High | Highest |
| 45. I feel so anxious and worried with my sickness and treatment that I need help from doctors and nurses.                                   | 1                                   | 2   | ③    | 4       |

From the above example, if you choose to **circle number 3**, it means that you are worried about your sickness and treatment, which is significant for your and necessary to gain assistance from doctors and nurses at high level.

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**Figure 2** The response format of SCNS-TBC

#### ***Step 4: Conducting initial item pool reviewed by experts***

After step 3, the researchers gained SCNS-TBC (Draft 1) which consisted of 62 items generated to cover the operational definition. Hence, in this step, the initial item pool had to be reviewed for content validity by experts who had body of knowledge and direct experiences with breast cancer patient undergoing chemotherapy. Appropriateness of response format was also evaluated, as well as its consistency with the scale's objectives. In this study, the SCNS-TBC (Draft 1) was checked for content validity by seven experts – three nursing instructor expertise in caring breast cancer patients and four Advanced Practice Nurses (APN) experienced in caring breast cancer patients and/or cancer patients who received chemotherapy (Appendix E).

#### **Methodology of content validity by experts**

Since the SCNS-TBC (Draft 1) was generated from the operational definition, all items (62 items) were not categorized into aspects. The researchers asked the experts to assess suitability of each item to rate how relevant each item is to what the researcher intend to measure. The experts assessed by providing score on 1 to 4 point scale that could reflect objectives and consistency with content and definition: 1 - not relevant, 2 - somewhat relevant, 3 - quite relevant, and 4 - highly relevant.

Each expert evaluated independently and provided additional suggestion for each item according to their opinion. Moreover, experts also evaluated suitability of words used, language usage, writing style, clarity of meaning, repetition of item, and suitability of response format of the scale. After reviewing, the researchers revised the scale according to suggestions from the experts.

### Data analysis

Regarding content validity testing in this study, the researchers computed two types of Content Validity Index (CVI): the Content Validity of Individual Items (I-CVI) and the Content Validity of overall Scale (S-CVI) (Polit and Beck, 2012; Polit et al., 2007). The I-CVI was calculated from numbers of experts who marked items at level 3 or 4 divided by numbers of all experts. To be acceptable, the I-CVI score should be .80 or over. The I-CVI score of less than .08 led to deletion of the item. Moreover, S-CVI was calculated from average value of I-CVI of all items. Acceptable value of S-CVI should be .90 or over (Polit et al., 2007).

### Result

Since question items in this SCNS-TBC were constructed only from analysis of content gained from interviewing participants with direct experience. The conceptual framework for constructing questions covered the operational definition gained from step 1. Therefore, results of assessment by the seven experts indicated their opinion on question items that were consistent with objectives and possible to assess attributes of SCNs for Thai women with breast cancer undergoing chemotherapy. It was found that I-CVI value was between 0.57 – 1.00, with 39 items had I-CVI of 1.00, nine items had I-CVI of 0.86, 10 items had I-CVI of 0.71, and four items had I-CVI of 0.57 while S-CVI value was 0.91 (Table 14).

In addition, the experts also suggested edition of language used in questions that were repetitive in meaning or ambiguous in communication. The researchers had considered by item and kept 48 items with I-CVI more than 0.80. Language of some items was edited and some items were grouped together if they had similar meaning. Items with I-CVI of 0.71 were edited to make their language more suitable.

Repetitive meaning of items was considered and items were grouped together. Items with I-CVI of 0.57 were deleted. Therefore, there are 43 items were not change, 11 items were revised, six items were deleted and two repetitive questions were grouped together. Thus, the SCNS-TBC (Draft 2) consisted of 55 items left for consideration in the next step (Table14).

**Table 14** I-CVI and S-CVI of SCNS-TBC (Draft 1) (62 items)

| Items (62 items)   | I-CVI | Result of assessment (55 items)  |
|--|-------|--|
| 1. I am very afraid of being injected or drawn blood many times so I want nurses who are very experienced.                               | 0.86  | <u>Revise</u><br>1. I need a nurse who is highly skilled in injecting vein for chemotherapy.   |
| 2. I do not want anyone to disturb me. I want to rest silently during chemotherapy.  | 0.71  | <u>Revise</u><br>2. I need peaceful rest or sleep while undergoing chemotherapy.   |
| 3. I need something to make me warm while lying down for chemotherapy in air-conditioned room such as sheet to cover my head.            | 0.86  | <u>Group together (item 3 and 4)</u><br>3. I need a blanket, back-support pillow or arm-support blanket while undergoing chemotherapy. |
| 4. I need something to alleviate stiffness while lying down on bed for chemotherapy such as back-supported pillow or arm-supported sheet | 0.86  |  |
| 5. I need someone to assist me to a toilet while undergoing chemotherapy.  | 1.00  | <u>Keep</u><br>4.  |
| 6. I feel burning nose from the smell of chemotherapy I get.   | 0.71  | <u>Revise</u><br>5. I need a mask to reduce nasal congestion from the smell of chemotherapy.   |
| 7. I need nurses to walk over to ask or inspect me periodically while undergoing chemotherapy.   | 1.00  | <u>Keep</u><br>6.  |
| 8. I need help about pain and burns at injection site.   | 1.00  | <u>Keep</u><br>7.  |



**Table 14** I-CVI and S-CVI of SCNS-TBC (Draft 1) (62 items) (Cont.)

| Items (62 items)  | I-CVI | Result of assessment (55 items)  |
|---|-------|--|
| 9. I need some candies or warm herbal drinks such as ginger juice, pandan juice, lime grass juice to relieve bitter taste and viscous saliva while undergoing chemotherapy. | 1.00  | <u>Keep</u><br>8.  |
| 10. I need doctors and nurses to speak with me politely with no reprimand to make me worry.   | 0.86  | <u>Keep</u><br>9.  |
| 11. I need encouragement speech from doctor and nurses.   | 0.71  | <u>Revise</u><br>10. I feel discourage and hopeless and need doctors and nurses to cheer me up.                  |
| 12. I need my cousins to accompany me every time I meet with the doctor.  | 0.71  | <u>Revise</u><br>11. I need doctors to allow my cousins to accompany me while I meet with the doctor.            |
| 13. I need my family to involve in listening to information and make decision about my sickness and chemotherapy treatment.   | 0.86  | <u>Keep</u><br>12.   |
| 14. I need my family to warn me about each appointment with doctors and chemotherapy treatment.   | 1.00  | <u>Keep</u><br>13.   |
| 15. I need my family to accompany me and stay with me while undergoing chemotherapy at the hospital.  | 0.86  | <u>Keep</u><br>14.   |
| 16. I need my family to help me in submitting appointment card, blood drawing, taking x-ray, or contacting various departments on my treatment day at the hospital.         | 1.00  | <u>Keep</u><br>15.   |
| 17. I need facilitation for check-up admittance procedure at appropriate time.  | 0.57  | <u>Delete</u><br>This question is about a process that patients have to follow procedure of each hospital, which |

**Table 14** I-CVI and S-CVI of SCNS-TBC (Draft 1) (62 items) (Cont.)

| Items (62 items)   | I-CVI | Result of assessment (55 items)   |
|--|-------|---|
|  |       | cannot define suitable duration needed by each patient.   |
| 18. I need my family to encourage and accompany me while undergoing chemotherapy at hospital.  | 0.57  | <u>Delete</u><br>This question is repetitious with item no.12, 13, 15, and 16   |
| 19. I want to have check-up on the same day, both chemotherapy and others.   | 0.71  | <u>Revise</u><br>16 I need to have appointment to meet with doctors and other appointments such as blood test, x-ray, and chemotherapy on the same day. |
| 20. I have money problem and want to be treated according to my right without fee.   | 0.71  | <u>Revise</u><br>17 I need treatment expense support according to my treatment right.   |
| 21. I need to get government's welfare to support my other expenses concerning chemotherapy treatment at the hospital, such as bus fare, fuel expense, travel expense, accommodation and food expense. | 0.86  | <u>Keep</u><br>18.  |
| 22. I need doctors / nurses to take time to explain and give me suggestions.   | 1.00  | <u>Keep</u><br>19.  |
| 23. I need individual consult rather than group suggestions.   | 1.00  | <u>Keep</u><br>20.  |
| 24. I need doctors or nurses to explain to my family about my illness conditions and treatments.   | 1.00  | <u>Keep</u><br>21.  |
| 25. I need nurses or nutritionists to give knowledge or answer questions while I wait for the doctor.  | 1.00  | <u>Keep</u><br>22.  |

**Table 14** I-CVI and S-CVI of SCNS-TBC (Draft 1) (62 items) (Cont.)

| Items (62 items)  | I-CVI | Result of assessment (55 items) |
|---|-------|---------------------------------|
| 26. I need explanations from doctors about features / types and severity of my breast cancer.                               | 1.00  | <u>Keep</u><br>23.              |
| 27. I need to know information about approach and duration of treatment until I'm cured.                                    | 1.00  | <u>Keep</u><br>24.              |
| 28. I need details of treatment expenses and how to use my right to treatment without paying expenses.                      | 1.00  | <u>Keep</u><br>25.              |
| 29. I need doctors to tell me about the progress of my disease and treatment periodically.                                  | 1.00  | <u>Keep</u><br>26.              |
| 30. I need information about other treatment alternatives other than chemotherapy.  | 1.00  | <u>Keep</u><br>27.              |
| 31. I need explanations about using herbs along with chemotherapy.  | 1.00  | <u>Keep</u><br>28.              |
| 32. I need suggestions about side effects of chemotherapy on my body.   | 1.00  | <u>Keep</u><br>29.              |
| 33. I need explanations about blood test before chemotherapy, i.e. white blood and platelets test.                          | 1.00  | <u>Keep</u><br>30.              |
| 34. I need suggestions about behaviors that will make my blood test normal and enable me to endure continuous chemotherapy. | 1.00  | <u>Keep</u><br>31.              |
| 35. I need suggestions on behaviors that will help me cured from my breast cancer.  | 1.00  | <u>Keep</u><br>32.              |
| 36. I need information about activities and works I can do during my sickness and chemotherapy treatment.                   | 1.00  | <u>Keep</u><br>33.              |

**Table 14** I-CVI and S-CVI of SCNS-TBC (Draft 1) (62 items) (Cont.)

| Items (62 items)  | I-CVI | Result of assessment (55 items)                |
|---|-------|--|
| 37. I need suggestions about guidelines in using my arm on the breast cancer side in doing various activities.                        | 1.00  | <u>Keep</u><br>34.                             |
| 38. I need suggestions about types of food to take and types of food to avoid.  | 1.00  | <u>Keep</u><br>35.                             |
| 39. I need suggestions about individual alternatives and replacing food, such as supplementary or vitamins.                           | 1.00  | <u>Keep</u><br>36.                             |
| 40. I need to talk to exchange my experiences with other patients in the same conditions.   | 1.00  | <u>Keep</u><br>37.                             |
| 41. I need to relieve my nausea after chemotherapy treatment.   | 1.00  | <u>Keep</u><br>38.                             |
| 42. I cannot sleep and I need assistance about this.  | 1.00  | <u>Keep</u><br>39.                             |
| 43. I need nurse from the nearby hospital to visit me at my home in 2-3 days after each chemotherapy treatment.                       | 1.00  | <u>Keep</u><br>40.                             |
| 44. I need my family to prepare food I can eat when I lose my appetite.   | 1.00  | <u>Keep</u><br>41.                             |
| 45. I need my family to provide me sour food or fruit to alleviate nausea such as Tom-Yum, orange, mango, tamarind or mixed tamarind. | 1.00  | <u>Delete</u><br>Repetitious with item no. 44  |
| 46. I need my family to provide vegetarian food for me.   | 1.00  | <u>Delete</u><br>Rrepetitious with item no. 44 |
| 47. I need my family member to do housework for me during the time I feel very tired.   | 1.00  | <u>Keep</u><br>42.                             |
| 48. I need my family member to run errand for me during the time I cannot go out.   | 1.00  | <u>Keep</u><br>43.                             |

**Table 14** I-CVI and S-CVI of SCNS-TBC (Draft 1) (62 items) (Cont.)

| Items (62 items)   | I-CVI | Result of assessment (55 items)   |
|--|-------|---|
| 49. I want my boyfriend/husband to understand that I cannot respond to sexual relationship as before.  | 0.71  | <u>Revise</u><br>44. I need my boyfriend/husband to understand my limitations in sexual relationship caused by the disease and side effects of the treatment. |
| 50. I feel so anxious and worried with my sickness and treatment that I need help from doctors and nurses.   | 1.00  | <u>Keep</u><br>45.  |
| 51. I still cannot accept my sickness and treatment and need encouragement from my family.   | 1.00  | <u>Keep</u><br>46.  |
| 52. I am worried about my changing physical condition such as fallen hair, darkened lips, blackened nails, and darkened skin due to side effect of chemotherapy. | 0.57  | <u>Delete</u><br>This question repetitious with items no 51 and 55.   |
| 53. I need my family to speak with me sweetly and does not use words that will make me feel frustrated or hurt.  | 0.86  | <u>Keep</u><br>47.  |
| 54. I need my family to specially take care of me during the first week after chemotherapy.  | 0.57  | <u>Delete</u><br>This question cannot communicate clearly. "Specially take care" is very general and can mean many things.                                    |
| 55. I need my family to accept my body condition that changes from sickness and treatment without any dislike or embarrassment.                                  | 0.86  | <u>Keep</u><br>48.  |
| 56. I need my family members to call me.   | 0.71  | <u>Revise</u><br>49. I need my remote family member to make a phone call to talk and encourage me.  |

**Table 14** I-CVI and S-CVI of SCNS-TBC (Draft 1) (62 items) (Cont.)

| Items (62 items)  | I-CVI | Result of assessment (55 items)  |
|---|-------|--|
| 57. I need my family to bring me to make merit, donate and do good deeds to encourage me. | 1.00  | <u>Keep</u><br>50.   |
| 58. I need support for wigs, hats, and turbans from the hospital.                         | 1.00  | <u>Keep</u><br>51.   |
| 59. I need support for supplementary food that I cannot afford from the hospital.         | 1.00  | <u>Keep</u><br>52.   |
| 60. I want to get additional income to solve money problem.                               | 0.71  | <u>Revise</u><br>53. I need support for vocation/work to earn income in replacement of the old work that I cannot do during this time. |
| 61. I have to borrow money from my cousins.   | 0.71  | <u>Revise</u><br>54. I need financial help from my family and cousins when in need.  |
| 62. I need 24-hour phone consult when I have problems or doubts while I stay home.        | 1.00  | <u>Keep</u><br>55.   |
| <b>S-CVI</b>  |       | <b>0.91</b>  |

***Step 5: Considering inclusion of validation items by Face validity***

This step aims to consider suitability and understanding of respondents in all question items of the questionnaire revised according to suggestions of experts in Step 4 (DeVellis, 2012, 2016). In this study, each of the 55 items in SCNS-TBC (Draft 2) was checked for understanding in terms of clarity, ease of understanding, length, and appropriateness of overall questionnaire by interview with 10 participants who had direct experience in breast cancer and were undergoing chemotherapy.

**Sample**

*Selection criteria:* Samples in this study were women with breast cancer who were undergoing chemotherapy in super tertiary cancer care hospitals in the lower

northern region of Thailand (Buddhachinaraj Phitsanulok Hospital). Criteria for selection of participants were; 1) ages 20 years old and over; 2) diagnosed for invasive or advanced invasive breast cancer; 3) undergoing chemotherapy in any course and cycle; and 4) willing to participate in this study.

*Sampling technique:* Participants were selected through purposive sampling method (Etikan et al., 2016) according to selection criteria. All 10 Participants were willing to participate in giving opinion about clarity of question items in the questionnaire.

*Sample size:* The sample size in this step was not definitely prescribed. The researchers chose a group of 10 participants, depending mainly on results and saturation of opinion gained from the participants (Mason, 2010).

#### Instrument

The instrument used in this step was the 55-item SCNS-TBC (Draft 2) whose questions were revised according to suggestions of experts in Step 4.

#### Ethical consideration

Ethical considerations in this study were approved by the Ethical Review Committee of the Faculty of Medicine, the regional hospital of lower northern Thailand (decision No. 080/60). Participants' consent was acquired in both speech and signature in a consent form before asking opinion about this questionnaire.

#### Data collection

In collecting data for this step, the researchers had informed participants of the objectives in order to check understanding and clarity of each question item. The researchers read each question and participants gave opinion if the question was difficult to understand or ambiguous in conveying meaning.

### Data analysis

After collecting data from all 10 participants and analyzing opinions, question items were revised to make them clearer and more appropriate.

### Result

*General information:* All 10 participants were Thai women diagnosed by doctors to have breast cancer in invasive and advanced invasive stages. Average age was 46.9 years. All were undergoing chemotherapy.

*Face validity:* The results indicated that: 1) Instruction for filling out the questionnaire was clear by all participants; and 2) five items were identified as “*not easy to understand*” revised as shown in Table 15. After adjusting clarity of the five items, the resulting SCNS-THB (Draft 3) which consisted of 55 items was tried out in the Pilot study.

**Table 15** Face validity: five items were identified as “*not easy to understand*”

---

|            |   |
|------------|---|
| Item<br>10 | <i>“I feel <u>discourage and hopeless</u> and need doctors and nurses to cheer me up”</i> |
|------------|---|

“Discourage and hopeless” are quite abstract that some samples did not understand what to feel discourage and hopeless for. They suggested to change into **“I feel discourage and hopeless with the long chemotherapy treatment and I need doctors and nurses to cheer me up”**

|            |  |
|------------|--|
| Item<br>11 | <i>“I need doctors to allow my cousins to accompany me while I meet with the doctor”</i> |
|------------|--|

The samples explained that, normally, doctors allowed family to go with patients. Thus, it should be rewrite into **“I need my counsins to accompany me every time I meet with doctors”**



**Table 15** Face validity: five items were identified as “*not easy to understand*”

(Cont.)

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|            |   |
|------------|---|
| Item<br>36 | “ <i>I need suggestions about <u>individual alternatives</u> and replacing food, such as supplementary or vitamins</i> ”  |
|            | The sample did not understand what “alternatives” refer to. So, this should be rewrite into “ <b>I need suggestions about alternatives such as replacement food, supplementary or vitamins, to nourich my body during chemotherapy treatment period.</b> ”                      |
| Item<br>40 | “ <i>I need nurse from the nearby hospital to visit me at my home in 2-3 days after each chemotherapy treatment</i> ”   |
|            | The samples suggested that this item should be changed to “ <b>I need nurses or <u>village voluteers (VV.)</u> from nearby hospitals to visit me at my home in the first 2-3 days after each chemotherapy treatment</b> ” to make it more understandable.                       |
| Item<br>52 | “ <i>I need support for <u>supplementary food</u> that I cannot afford from the hospital</i> ”  |
|            | Some of the samples did not understand what supplementary food was and suggested to add examples. Hence, the question was edited to “ <b>I need supports from the hospital for supplementary food that I cannot afford such as <u>Ensure milk to increase my antibody</u></b> ” |

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**Step 6: Considering internal consistency by administering pilot study**

The purpose of this step is a pilot study in trying the 55-item SCNS-TBC (Draft 3) with a sample group in order to evaluate preliminary data of instrument's suitability before using in the parent study. The instrument initial reliability was also evaluated to see if it was sufficiently standardized for use in the parent study (Connelly, 2008; In, 2017).

## Sample

*Sample selection:* The selected sample group was Thai women with breast cancer treated at a tertiary hospital in lower northern region of Thailand (Buddhachinaraj Phitsanulok Hospital). Inclusion criteria included Thai women with breast cancer who were 20 years old or over, women who were diagnosed by doctors to have breast cancer in invasive and advanced invasive stage, women who received only chemotherapy with any formula in any course or cycle, and women who could communicate in Thai and were willing to participate in the research project.

On the other hand, exclusion criteria was those who had problems with thinking, decision-making, or physical readiness that could affect ability to respond to the questionnaire. Selection of sample group was purposive sampling and also recommended by ward nurses.

*Sample size:* According to Connelly (2008), extant literature suggests that a pilot study sample should be 10% of the sample projected for the larger parent study (Connelly, 2008). However, Hertzog (2008) cautions that this is not a simple or straight forward issue to resolve because, in the study of some cases, there might be several factors that affected number of sample in the pilot study (Hertzog, 2008). Julious (2005) in the medical field suggested 12 (Julious, 2005) Whereas Burns and Grove (2001) recommended that the scale should be administered to 15-30 subjects (Burns and Grove, 2001). Hence, in this step, the researchers selected a sample group of 30 subjects.

## Instrument

The questionnaire used in this pilot test was the SCNS-TBC (Draft 3) with 55 items. All items required decision to determine how the question was a problem or

solution necessary and needed by the respondents during the duration of treating breast cancer with chemotherapy. The questionnaire was a four-point rating scale; 1- the lowest level of significance and necessity to gain assistance; 2- low level of significance and necessity to gain assistance; 3- high level of significance and necessity to gain assistance; and 4- the highest level of significance and necessity to gain assistance.

#### Ethical Considerations

This study was approved by the Ethical Review Committee of the Faculty of Medicine, the regional hospital of lower northern Thailand (decision No. 080/61) (Appendix F). Written informed consent was obtained from all of the participants.

#### Data Collection

The researchers approached eligible participants who were then contacted by cancer care staff and considered in accordance with inclusion criteria. Detailed information (Appendix G) regarding the study was provided, written informed consent was obtained, and interviews were scheduled. Data collection was conducted from May to June 2018.

After consent of sample group and endorsement of Consent form (Appendix G), the researchers collected data on sociodemographic variables by interview. Clinical information (breast cancer stage, and regimen chemotherapy received) was extracted from medical records. After that, the researchers explained direction for replying to the scale and asked the sample group for their ability to reply on their own. For the samples who were able to read and understand how to reply, the researchers gave them questionnaires to do on their own. For the sample who could not answer by themselves, such as those getting chemotherapy on their dominant

hand, those with inability in reading, seeing or sitting to write answers, the researchers would read each item for them and asked them about the level they needed that supportive care according to their feeling or opinion. Each item was divided into four levels, ranging from the lowest level of significance and necessity to gain assistance to low level, high level, and the highest level of significance and necessity to gain assistance, respectively. After completing the questionnaire, the researchers checked for correctness and completeness and gave souvenir to each participant in the sample group.

#### Data Analysis

Statistical analyses were conducted using IBM SPSS statistical software (version 20). Demographic and clinical characteristics were summarized using descriptive statistics. Reliability statistic, both by item and overall, including Corrected Item-Total Correlation and Cronbach's Alpha if item deleted, were analyzed with Cronbach alpha reliability coefficients because Cronbach's alpha was used to calculate the internal consistency reliabilities (DeVellis, 2012; Nunnally, 1994).

#### Results

##### *Participant Characteristics*

The demographic and clinical characteristics of all 30 participants are shown in Table 16. The majority of participants were aged 41 to 60 years (66.6%) with an average of 44.77 years (SD 9.073). Most are married (90%) and all are Buddhists (100%). Most have primary education (43.3%) and are farmers (26.6%). Most have income less than 10,000 baht per month (70%) and use treatment right with 30-baht Gold Card (63.3%)

**Table 16** Demographic and Clinical Characteristics in pilot study (n = 30)

|  | n  | %    |
|--|----|------|
| <b>Age, years (<math>\bar{x}</math> 44.77, SD 9.073)</b> |    |      |
| 20 – 40  | 8  | 26.7 |
| 41 - 60  | 20 | 66.6 |
| > 60   | 2  | 6.7  |
| <b>Status</b>  |    |      |
| Single   | 2  | 6.7  |
| Married  | 25 | 83.3 |
| Divorced   | 3  | 10   |
| <b>Religion</b>  |    |      |
| Buddhism   | 30 | 100  |
| <b>Highest education</b>                                 |    |      |
| None   | 1  | 3.3  |
| Primary  | 13 | 43.3 |
| Junior secondary   | 5  | 16.7 |
| Senior secondary or vocational certificate               | 2  | 6.7  |
| Diploma  | 4  | 13.3 |
| Bachelor's degree  | 5  | 16.7 |
| <b>Profession</b>  |    |      |
| None   | 6  | 20   |
| Trade  | 2  | 6.7  |
| General labor  | 6  | 20   |
| Personal business  | 2  | 6.7  |
| Private company employee                                 | 3  | 10   |
| Government official                                      | 3  | 10   |
| Farmer   | 8  | 26.6 |
| <b>Monthly income</b>                                    |    |      |
| < 10,000 baht  | 21 | 70   |
| 10,001 – 30,000 baht                                     | 5  | 16.7 |
| 30,001 – 50,000 baht                                     | 3  | 10   |
| > 50,000 baht  | 1  | 3.3  |
| <b>Treatment right</b>                                   |    |      |
| Government welfare                                       | 4  | 13.4 |
| Social security  | 7  | 23.3 |
| 30-baht Gold card  | 19 | 63.3 |
| <b>Diagnosis</b>   |    |      |
| Left breast cancer                                       | 17 | 56.7 |
| Right breast cancer                                      | 13 | 43.3 |

**Table 16** Demographic and Clinical Characteristics in pilot study (n = 30) (Cont.)

|   | n  | %    |
|---|----|------|
| <b>Stage of breast cancer</b>             |    |      |
| Invasive breast cancer                    | 24 | 80   |
| Advanced invasive breast cancer           | 6  | 20   |
| <b>Operation</b>                          |    |      |
| Breast has been removed                   | 24 | 80   |
| Breast has not been removed               | 6  | 20   |
| <b>Chemotherapy regimen</b>               |    |      |
| AC regimen                                | 18 | 60   |
| FAC regimen                               | 4  | 13.3 |
| Paclitaxel regimen                        | 5  | 16.7 |
| Docetaxel regimen                         | 3  | 10   |
| <b>Course of chemotherapy</b>             |    |      |
| First-line chemotherapy                   | 25 | 83.3 |
| Second-line chemotherapy                  | 5  | 16.7 |
| <b>Cycle of chemotherapy</b>              |    |      |
| No 1                                      | 4  | 13.4 |
| No 2                                      | 6  | 20   |
| No 3                                      | 7  | 23.3 |
| No 4                                      | 10 | 33.3 |
| No 6                                      | 1  | 3.3  |
| No 8                                      | 1  | 3.3  |
| No 9                                      | 1  | 3.3  |
| <b>Duration of receiving chemotherapy</b> |    |      |
| < 3 months                                | 9  | 30   |
| 4 – 6 months                              | 3  | 10   |
| 7 – 9 months                              | 8  | 26.7 |
| 10 – 12 months                            | 7  | 23.3 |
| > 12 months                               | 3  | 10   |

Most of the sample group are diagnosed with left breast cancer (56.7%) in invasive stage (80%) and are operated before receiving chemotherapy (80%). Most patients receive AC Regimen chemotherapy (60%) which consists of two types of medicines: Doxorubicin and Cyclophosphamide. Most samples receive first-line

chemotherapy (83.3%) in the 4th cycle (33.3%) for a period of less than three months (30%).

#### *Instrument Try-out*

Instrument try-out was conducted with 30 Thai women with breast cancer undergoing chemotherapy. Results are described as follows:

1. Findings about participants' responses to the SCNS-TBC indicated that most participants (66.67%) could not answer the questionnaire by themselves due to old age, bad eyesight, and unready physical condition to read and write. Some participants received chemotherapy on the dominant side. Having IV line and injection on hand and wrist made the participants inconvenient to do the questionnaire by themselves. So, they had to get help in reading questions from the researchers. Furthermore, it was also found that the participants took about 20-30 minutes to complete this 55-item questionnaire.

2. In this study, construct reliability was employed. The rule of thumb for a construct reliability estimate is that 0.7 or higher suggests good reliability (DeVellis, 2012; Nunnally, 1994). High construct reliability indicates that internal consistency exists. For this study, reliability was an evaluation of the newly-devised questionnaire before using with a larger group of samples in the evaluation of psychometric properties step. Results of this study indicated that the Cronbach's alpha of overall SCNS-TBC was .886. Since question items in the SCNS-TBC (Draft 3) were not categorized, reliability value of the questionnaire was presented as overall value.

3. The acceptable minimum point of corrected item-total correlation for this pre-testing instrument is based on the recommendation of Clark and Watson (1995) which is between .15 to .20 (Clark and Watson, 1995). There were 11 items with

corrected item-total correlation lower than .20; namely, item 2 (.027), item 3 (.079), item 8 (.168), item 10 (-.016), item 12 (.188), item 14 (.157), item 36 (.011), item 41 (.058), item 42 (.076), item 45 (.193), and item 49 (.129) as shown in table 17. These items needed to be edited or deleted from the questionnaire whereas the highest corrected item-total correlation was in item 6 (.702).

**Table 17** Mean (SD), Corrected item-total correlation and Cronbach's Alpha if item deleted in pilot study (N = 30)

| Item  | Mean<br>(1-4)<br>(SD) | Corrected<br>item-total<br>correlation | Cronbach's<br>Alpha if<br>item deleted |
|---|-----------------------|--|--|
| 2. I need peaceful rest or sleep while undergoing chemotherapy.   | 2.93<br>(.828)        | .027                                   | <u>.887</u>                            |
| 3. I need a blanket, back-support pillow or arm-support blanket while undergoing chemotherapy.  | 2.63<br>(.850)        | .079                                   | <u>.887</u>                            |
| 8. I need some candies or warm herbal drinks such as ginger juice, pandan juice, lime grass juice to relieve bitter taste and viscous saliva while undergoing chemotherapy. | 2.37<br>(.850)        | .168                                   | .886                                   |
| 10. I feel discourage and hopeless and need doctors and nurses to cheer me up.  | 2.93<br>(.980)        | -.016                                  | <u>.889</u>                            |
| 12. I need my family to involve in listening to information and make decision about my sickness and chemotherapy treatment.   | 3.03<br>(.964)        | .188                                   | .886                                   |
| 14. I need my family to accompany me and stay with me while undergoing chemotherapy at the hospital.  | 2.77<br>(1.040)       | .157                                   | .886                                   |
| 36. I need suggestions about individual alternatives and replacing food, such as supplementary or vitamins.   | 3.00<br>(.983)        | .011                                   | <u>.888</u>                            |
| 41. I need my family to prepare food I can eat when I lose my appetite.   | 2.63<br>(.999)        | .058                                   | <u>.888</u>                            |
| 42. I need my family member to do housework for me during the time I feel very tired.   | 2.60<br>(.968)        | .076                                   | <u>.887</u>                            |



**Table 17** Mean (SD), Corrected item-total correlation and Cronbach's Alpha if item deleted in pilot study (N = 30) (Cont.)

| Item   | Mean (1-4)<br>(SD) | Corrected<br>item-total<br>correlation | Cronbach's<br>Alpha if<br>item deleted |
|--|--------------------|--|--|
| 45. I feel so anxious and worried with my sickness and treatment that I need help from doctors and nurses. | 2.47<br>(.973)     | .193                                   | .886                                   |
| 49. I need my remote family member to make a phone call to talk and encourage me.                          | 2.43<br>(1.040)    | .129                                   | <u>.887</u>                            |

4. In deletion of item, value of Cronbach's Alpha if item deleted should also be considered. If deletion of the item makes Cronbach's Alpha if item deleted value lower than overall Cronbach's Alpha (.886), the item may not be deleted but edited to make it more complete. In this study, there were some items with corrected item-total correlation lower than .02 which, after deleting the items, overall Cronbach's Alpha value would be higher. Therefore, those seven items were deleted from the questionnaire; namely, item 2 (.887), item 3 (.887), item 10 (.889), item 36 (.888), item 41 (.888), item 42 (.887), and item 49 (.887), as shown in Table 17.

However, in results of this step, the researchers had not deleted these question items from the SCNS-TBC (Draft 3) these question items were still important for the assessment of SCNs for Thai women with breast cancer undergoing chemotherapy. Mean of SCNs of these question items were still significant and necessary in moderate level (2.01-3.00) to high level (3.01-4.00). Similarly, overall reliability of the SCNS-TBC was higher than the standard value for use in parent study. Therefore, the 55-item (Draft 3) would be used the identification of the dimensions of SCNs.

## Section II Psychometric properties testing

As this section is a main study of this dissertation, content of this section is presented in Methodology consisting of procedure, sample group, sampling selection, sampling size calculation, sample right protection, data gathering process, and data analysis. On the other hand, results of the psychometric properties testing process of SCNS-TBC will be presented in Chapter IV.

This section continued from the six step of Scale construction. The Psychometric properties testing section consisted of two steps, starting from Step 7 - Identifying the dimensions of SCNS-TBC by using Exploratory Factor analysis (EFA) and step 8 - Testing psychometric properties of SCNS-TBC by using Confirmatory Factor Analysis (CFA).

### Sample

Thai women with breast cancer undergoing chemotherapy at super tertiary cancer care unit randomly chosen from all over the country were selected with the following inclusion criteria.

1. Thai female patients diagnosed from doctors as having breast cancer in both invasive breast cancer and advanced invasive breast cancer stages.

2. Age of 20 years old or over

3. Currently undergoing any formula of chemotherapy in any course and cycle

4. Have sound and disposing mind, ability to communicate in Thai language, and willingness to participate in the research

### Sample size

Since sample groups in the two steps - EFA and CFA – are not the same group, for calculation of sample size in EFA and CFA steps, the researchers need to

consider suitability and sufficiency of sample size. Generally, size of sample depends on number of variables to be measured. If there are not many variables, sample size should be 5-10 times of number of variables to be measured (1:5-10) (Auerwald and Moshagen, 2019). In this study, variables consist of 55 items. Thus, sample size should be 275 – 550 persons. Williams et al. recommend that if there are large number of variables, determination of sample size to 300 persons is good and 500 persons is very good (Williams, Onsmann, & Brown, 2010). In this study, the researchers selected sample size of 300 persons with 15% addition to prevent incomplete questionnaires. So, sample size in this study was set at 345 persons in EFA study and 345 persons in CFA study (Total 690 persons), with different sample group for the EFA and CFA studies.

1. Sample group for the use of questionnaire with large sample size (Conducting field-test) for EFA and Item analysis was 345 Thai women with breast cancer undergoing chemotherapy.

2. Sample group for CFA and Psychometric property testing for the final form of the test was 345 Thai women with breast cancer undergoing chemotherapy.

#### Subject allocation

This study used the following Multi-Stage Sampling (Figure 3).

1. Thailand is divided into four regions with a total of 29 super tertiary cancer care units: four in northern region, seven in northeastern region, 15 in Bangkok metropolitan and central region, and three in southern region.

For the scale construction section consisting of step 1 - 6 presented above, the sample group in that step is from Buddhachinnaraj Phitsanulok Hospital which is in the lower northern region of the four-regional division. Hence, to prevent repetition of

data source, Buddhachinnaraj Phitsanulok Hospital is deleted from the list of hospitals to be randomized in the Psychometric properties testing section. So, there are a total of 28 hospitals for this study: three in northern region, seven in northeastern region, fifteen in Bangkok Metropolitan and central region, and three in southern region.

2. Simple random sampling without replacement was used to choose hospital in each region, with a ratio of 1:3 together with sufficiency of samples in each randomized hospital. Therefore, the initial random yielded a total of nine hospitals: one from three hospitals from northern region (Lampang Cancer Hospital), two from seven hospitals from northeastern region (Udon Thani Cancer Hospital and Udon Thani Hospital), three from nine hospitals from Bangkok (National Cancer Institute, Chulalongkorn Hospital, and Phramongkutklo Hospital), two from six hospitals from central region (Lopburi Cancer Hospital, and Chonburi Cancer Hospital), and one from three hospitals from southern region (Surat Thani Cancer Hospital). There are nine from 28 hospitals.

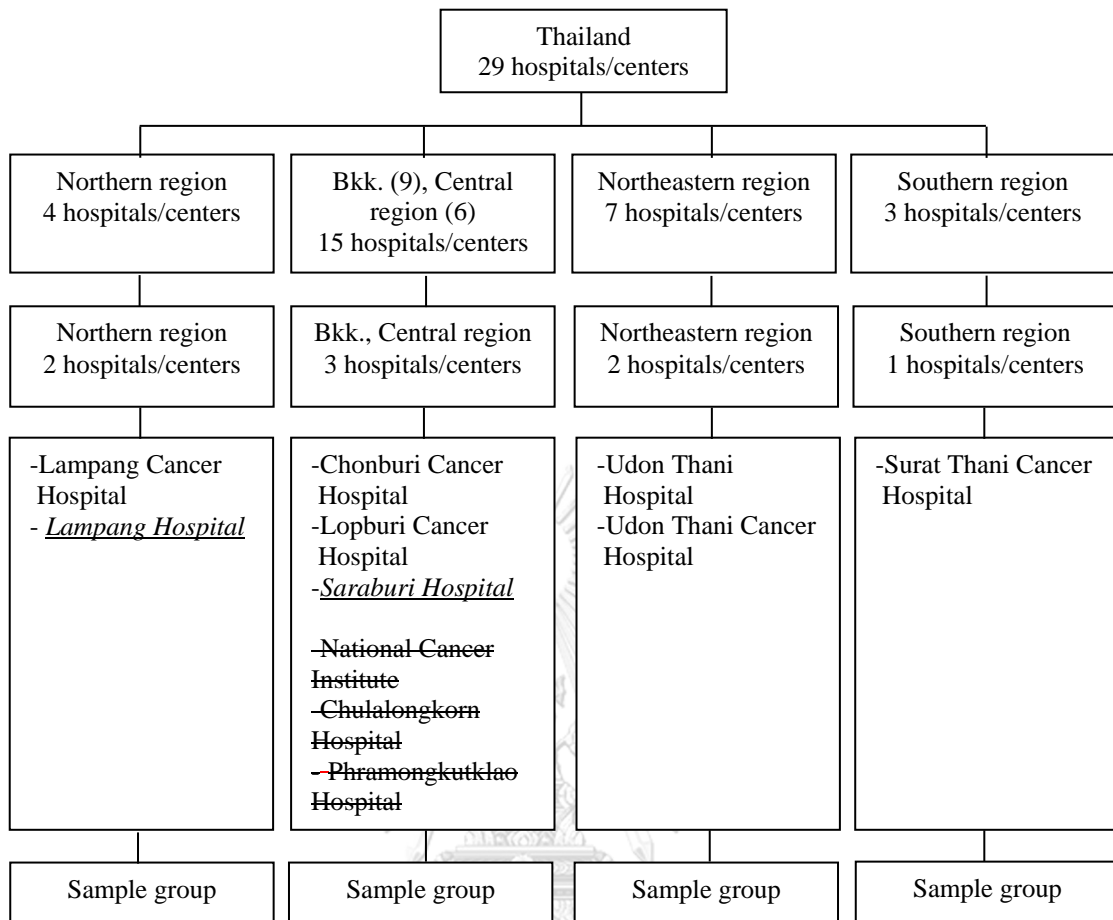
*Note:* After the random process, the researchers coordinated with all nine hospitals to ask for research ethical consent before collecting data. The following problems were found:

2.1 Lampang Cancer Hospital in northern region had quite a small number of samples according to the inclusion criteria. This is because Lampang Cancer Hospital is a cancer hospital where most patients undergo chemotherapy together with radiation due to widespread condition of the cancer. Thus, the researchers added another randomized hospital, that is, Lampang Hospital - a provincial hospital that had sufficient samples for data collection. So, there were 2 hospitals from northern region.

2.2 There were nine super tertiary cancer care hospitals in Bangkok Metropolitan. After contact for data collection with the 3 randomized hospitals (National Cancer Institute, Chulalongkorn hospital, and Phramongkutklo hospital), it was found that, according to qualifications of sample in this research, there were only a few patients with breast cancer in invasive and advanced invasive stages who underwent chemotherapy only. As most patients had wide spread of cancer, they were sent to hospitals in Bangkok for treatment which mostly integrated with radiation treatment. As a result, data could not be collected from sample group from hospitals in Bangkok Metropolitan area. The researchers, then, randomized one more hospital from central region, that is, Saraburi Hospital. So, there were three hospitals from central region.

From randomization of hospitals from the four-region all division of Thailand in this study, and after solving problems of insufficient number of samples, it could be concluded that sources of data for this study consisted of a total of eight hospitals: two from northern region (Lampang Cancer Hospital and Lampang Hospital), two from northeastern region (Udon Thani Cancer Hospital and Udon Thani Hospital), three from central region (Lopburi Cancer Hospital, Chonburi Cancer Hospital, and Saraburi Hospital), and one from southern region (Surat Thani Cancer Hospital) (Figure 3).

3. Sample group from each hospital was selected by purposive sampling according to inclusion criteria. Number of sample from each hospital was not definitely determined because number of sample varied uncontrollably. So, the number was roughly set at 80 – 100 persons per hospital.



**Figure 3** Multi - Stage Sampling

#### Instrument

The instrument used in this process was the 55-item SCNS-TBC (Draft 3) which had two parts.

1. Part 1 which assessed SCNs of Thai women with breast cancer undergoing chemotherapy consisted of 55 question items. The assessment is focused on level of significance and necessity of each SCNs that patients think is significant and necessary to gain assistance from the lowest to the highest level, signifying by numbers 1-4 according to a four-point rating scale: 1- the lowest level of significance

and necessity to gain assistance; 2- low level of significance and necessity to gain assistance; 3- high level of significance and necessity to gain assistance; and 4- the highest level of significance and necessity to gain assistance.

2. Part 2 asked for general personal information that the patients were able to answer by themselves, as well as information about breast cancer and chemotherapy treatment that the researchers could extract from the patients' OPD card.

#### Protection of human subjects

Data collection of this study was allowed by the Institutional Review Board of all eight hospitals (appendix F). Details of research project and data collection process were explained to doctors, head nurses, heads of chemotherapy unit, ward nurses and relevant persons before conducting the research.

Before the sample group decided to participate in the research, they got documents explaining information about the research in order to inform them about objectives and details of the study. The sample had enough time to decide freely before signing consent forms (Appendix G). Important details included:

1. Protection of participants' information. Data gained from questionnaires' responses would be combined with data from other participants in this study. All data were kept secret. The researchers used codes instead of participants' names in data recording form. Research results were presented as overall. If the researchers published results of the study, no participants' names would be revealed in any case.

2. Participation in this research was volunteered. If participants did not want to involve in the project, they could deny or withdraw from the project at any time without notifying in advance. Denial or withdrawal from the project did not affect any service and treatment they should get from hospitals.

3. Regarding possible risks, participants might feel fatigue while answering the questionnaire. In that case, participants could stop and rest. If participants had abnormal condition while participating in the project, they would get initial care and treatment according to the standard of care for breast cancer patients undergoing chemotherapy by the researchers who were experienced and well-trained in caring for breast cancer patients undergoing chemotherapy.

4. For possible benefits, the patients would be informed of benefits in participating in the project. Results of this research would be very useful for development of scale for assessing SCNs of Thai women with breast cancer undergoing chemotherapy. Nurses and relevant persons could use this scale to assess SCNs of Thai women with breast cancer undergoing chemotherapy correctly. Results of the assessment would lead to development of guidelines to increase quality of nursing in order to promote, support, and facilitate those women to encounter changes and impacts from breast cancer and chemotherapy treatment, both while undergoing chemotherapy at hospitals and while recovering at home. All these would enable patients to live with their illness and treatment peacefully with better life quality.

#### Data collection process

*Preparation of research assistant:* In this step, data were collected by the researchers or researcher assistants who were registered nurses. Before data collection, the researchers prepared research assistants in each data source hospital by explaining about research objectives, evaluative research process used to collect data. The research assistants were also trained to have skills in selecting samples and collecting data.



*Data Collection:* Conduction of field-test for psychometric properties testing was divided into two sessions.

1. Exploratory Factor analysis (EFA) – the researchers collected data from a total 345 samples.

2. Confirmatory Factor analysis (CFA) - the researchers collected data from a total 345 samples.

*Procedures:*

1. After permission to collect data from the Institutional Review Board of all eight hospitals (Appendix F), the researchers went to meet with the head nurse of chemotherapy department of each hospital to introduce oneself, explain about objectives of the research process, and ask for cooperation in collecting data.

2. The researchers or research assistants selected samples according to the inclusive criteria.

3. When the samples expressed their willingness to participate in the research, the researchers or research assistant explained to them about objectives of the research and protection of their rights.

4. The researchers or research assistant distributed documents to sample population or research participants, as well as consent forms of sample population or research participants (Appendix G). The researchers or research assistant also explained details of both documents and asked participants to sign the consent forms.

5. After research participants signed the consent forms, the researchers or research assistant distributed the questionnaire to participants, explained how to answer the questionnaire, and allowed participants to ask questions.

6. Participants answered the questionnaire by themselves within about 20- 30 minutes. However, if the participants could not answer by themselves due to any limitations, the researchers or research assistants would read each question item for them and let the participant considered and made decision about level of significance and necessity to gain assistance from the lowest to the highest, representing by numbers 1 – 4.

7. The researchers checked completeness of responses in the questionnaire. If there was incomplete response, the researchers or research assistant asked participants to complete all of the questions.

8. The researchers gathered data from each session and conducted statistical analysis.

9. Data collected for the EFA study and CFA study were from different period of time. The researchers collected data for the EFA first. After analyzing for EFA, data were collected for the CFA study. Hence, sample groups for the CFA study were not the same as the EFA study. The researchers and research assistants checked and rechecked until it was certain that they were not the same group of sample, even though they came from the same hospitals.

#### Data Analysis

In this step, Thai women with breast cancer undergoing chemotherapy at super tertiary cancer care units in Thailand were considered as unit of analysis. Data from the SCNS-TBC were analyzed using the following statistics.

##### *Part 1 Descriptive statistics*

1. General personal information and information about breast cancer and chemotherapy treatment were analyzed for Frequency, Percentage, Means, Standard

deviation, Median, Minimum, and Maximum in order to show distribution of data about basic characteristics of the sample group.

2. Information about SCNs for Thai women with breast cancer undergoing chemotherapy was analyzed for Mean and Standard deviation.

### *Part 2 Evaluation of psychometrics properties*

1. Construct validity was divided into two types: Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA).

1.1 EFA was conducted using IBM SPSS statistical software (version 20). The statistical analysis used Common factor method which was a Principle Components Analysis (PCA) – the best method for information with normal distribution. The core was rotated by the Orthogonal Rotation with Varimax with Kaiser Normalization method. Criteria for considering results of factor analysis used by the researchers included three item exclusion criteria: 1) factor weight was lower than 0.3; 2) remaining item was not less than three items; and 3) meaning of items must be able to grouped into the same factor (Auerswald and Moshagen, 2019; Ferketich, 1991; Williams et al., 2010).

1.2 CFA was conducted after the EFA. The researchers used results from the EFA to analyze CFA by determining level of consistency between research model and empirical data. The researchers conducted the following statistics (Farrell and Rudd, 2009; Hooper, Coughlan, & Mullen, 2008) by using R package “lavaan”.

1.2.1 Chi-square statistics was used to test statistical hypothesis if the Inter-Item Correlation was zero. If Chi-square was very low or near zero and was non-significant, the model was consistent with empirical data.

1.2.2 Ratio of Chi-square /  $df$ . When sample group was large, Chi-square would be very high until results might be incorrectly concluded. Hence, the ratio of Chi-square/ $df$  should not exceed 2.

1.2.3 Goodness-of-fit index (Fihn et al.) is a proportion of difference between model consistency function before and after adjustment and consistency function before model adjustment. If GFI was between 0.9-1, the model was consistent with empirical data.

1.2.4 Adjusted goodness-of-fit index (AGFI) was derived by revising GFI with consideration of  $df$ , as well as number of variation and sample size, in order to find AGFI. If the AGFI was between 0.9-1, the model was consistent with empirical data.

1.2.5 Comparative fit index (CFI) was used to compare hypothetical research model with empirical data to determine consistency. The value of 0.9-1 indicated consistency between the model and empirical data.

1.2.6 Standardized root mean squared residual (Standardized RMR) signified discrepancy of the model. If the value was less than 0.05, the model was consistent with empirical data.

1.2.7 Root mean square error of approximation (RMSEA) indicated inconsistency between the constructed model and covariance matrix of population. If RMSEA was less than 0.05, the model was consistent with empirical data.

1.2.8 Critical N (CN) was an index signifying sample size that could accept consistency index of the model. CN should be higher than 200 of the sample group.

1.2.9 Fitting residuals matrix was a matrix with difference of matrix  $S$  and  $\Sigma$ . If the value was near zero, the model tended to be consistent with empirical data. The suitable value was between -2 and 2.

1.2.10 Model modification indexes (MI). The researchers adjusted the model based mainly on theories and research works. Reasonableness of parameter estimation was checked by considering Modification index (MI). The highest MI was chosen together with reason to adjust. The MI value which was higher than 3.84 was adjusted because it was considered to be critical Chi-square value at  $df = 1$  and  $\alpha = 0.05$ . Model adjustment principles included: 1) consider explainable theoretical reason, 2) adjust MI value one at a time and reanalyze, 3) consider various parameters that signify size and direction, as well as Overall fit of the model. Adjustment was stopped when it was obvious that, overall, the model was consistent with empirical data (Hooper et al., 2008). Therefore, the researchers used criteria for verifying consistency between the constructed model and empirical data as summarized in Table 18.

**Table 18** Statistics used to verify consistency between hypothetical structural equation model and level of acceptance

| Statistics used to verify consistency | Level of acceptance                         |
|---------------------------------------|---|
| 1. Chi-Square                         | Non-significant of P-value higher than 0.05 |
| 2. Chi-Square / <i>df</i> ratio       | Not exceed 2                                |
| 3. GFI, AGFI, CFI                     | From 0.9-1 signifies consistency of model   |
| 4. Standardized RMR, RMSEA            | Less than 0.05                              |
| 5. CN                                 | Higher than or equal to 200 of sample group |
| 6. Largest standardized residual      | Between -2 and 2                            |

## 2. Reliability

2.1 Item-total correlation ( $r$ ) – each question item has quality when  $r$  value is not lower than 0.3. If there are not many questions, the  $r$  value can be 0.2 or over, but not lower than 0.2 (DeVellis, 2012, 2016).

2.2 Coefficient alpha or Cronbach Coefficient using Cronbach's method – the value of 0.7 or over means that the questionnaire is highly reliable (Rodenberg, 2009), has internal consistency and can be used.

In summary, this chapter provided details of the research methodology of constructing the SCNS-TBC and testing psychometric properties. The results of the SCNS-TBC construction were presented in this chapter and the results of the main study for psychometric properties testing would be reported in the chapter IV.

## CHAPTER IV

### RESULTS

The study of Development of Supportive Care Needs Scale for Thai women with breast cancer undergoing chemotherapy (SCNS-TBC) aims to determine operational definition of Supportive care Needs (SCNs) and construct a new instrument - the SCNS-TBC. This Instrumental development study covers a period from January 2017 to June 2019, dividing into sections of literature review, scale construction, and evaluation of the psychometric properties. Content in this chapter is divided into two parts: results from evaluation of the psychometric properties – 1) results of Exploratory Factor Analysis (EFA) and 2) Confirmation Factor Analysis (CFA). The researchers present results of the study as follow:

#### **Psychometric properties testing**

This results of the psychometric properties testing were reported into two major: Step 7: Identifying the dimensions of SCNS-TBC by using EFA and Step 8: Testing psychometric properties of SCNS-TBC by using CFA.

#### ***Step 7: Identifying the dimensions of SCNS-TBC***

As the SCNS-TBC instrument was developed from interview and questions were written from content analysis process, the items were not initially categorized into aspects. Therefore, in this step, identifying dimensions of SCNS-TBC was established using EFA. A group of 350 Thai women with breast cancer undergoing chemotherapy was selected from five super tertiary cancer care units - Lampang Hospital, Chonburi Cancer Hospital, Lopburi Cancer Hospital, Udon Thani Cancer

Hospital, and Surat Thani Cancer Hospital. These hospitals were randomized from all units in every region of Thailand and passed consideration of research in human ethic.

*Note:* Sample size of this step in chapter III was specified at 345 persons. However, in real data collection, the researchers could collect data from 350 persons. Thus, in this step, data were analyzed from a sample group of 350 persons. In addition, sources of data of this sample group consisted of five hospitals from the eight hospitals randomized and presented in Chapter III. This was because data could be collected only from hospital that gave its research ethic approval and only five hospitals gave their approval as mentioned earlier.

Before data analysis, the researchers checked data Outliers which could affect error in data analysis. From results of the analysis, no outlier was found from any questionnaire. Number of sample in this analysis was 350 persons. Results of this study are presented in four parts: 1) General information, 2) Reliability before EFA analysis, 3) Exploratory Factor Analysis (EFA), and 4) Reliability after EFA analysis.

#### 1. General information about characteristics of sample group

The demographic and clinical characteristics of all 350 participants are shown in Table 20. The majority of participants were aged 41 to 60 years (58.9%) with an average of 47.93 years (SD 10.73) Most are married (64.9%) and all are Buddhists (97.4%). Most have primary education (38.6%) and are farmers (26.3%). Most have income less than 10,000 baht per month (67.7%) and use treatment right with 30-baht Gold Card (68.9%).

Most of the sample group are diagnosed with left breast cancer (55.4%) in invasive stage (69.4%) and are operated before receiving chemotherapy (76.3%). Most patients receive AC Regimen chemotherapy (59.1%) which consists of two



types of medicines: Doxorubicin and Cyclophosphamide. Most samples receive first-line chemotherapy (79.4%) between the 2<sup>nd</sup> and 5<sup>th</sup> cycle (67.7%) for a period of less than 3 months (69.1%) (Table 19)

**Table 19** Demographic and Clinical Characteristics in EFA study (n = 350)

|  | n   | %    |
|--|-----|------|
| <b>Age, years (23-74 years, <math>\bar{x}</math> 47.93, SD 10.731)</b> |     |      |
| 20 – 40  | 98  | 28.0 |
| 41 - 60  | 206 | 58.9 |
| > 60   | 46  | 13.1 |
| <b>Status</b>  |     |      |
| Single   | 44  | 12.6 |
| Married  | 227 | 64.8 |
| Widowed  | 50  | 14.3 |
| Divorced   | 29  | 8.3  |
| <b>Religion</b>  |     |      |
| Buddhism   | 341 | 97.4 |
| Islamism   | 9   | 2.6  |
| <b>Region</b>  |     |      |
| Northern   | 85  | 24.3 |
| Northeast  | 74  | 21.1 |
| Central  | 111 | 31.7 |
| Southern   | 80  | 22.9 |
| <b>Education Level</b>   |     |      |
| Unschool   | 16  | 4.6  |
| Primary  | 135 | 38.5 |
| Junior secondary   | 85  | 24.3 |
| Senior secondary or vocational certificate                             | 42  | 12.0 |
| Diploma  | 29  | 8.3  |
| Bachelor's degree  | 37  | 10.6 |
| Upper Bachelor's degree  | 6   | 1.7  |
| <b>Occupation</b>  |     |      |
| No working   | 75  | 21.5 |
| Merchant   | 47  | 13.4 |
| Temporary worker   | 46  | 13.1 |
| Business owner   | 15  | 4.3  |
| Company employee   | 41  | 11.7 |
| State enterprise officer   | 5   | 1.4  |

**Table 19** Demographic and Clinical Characteristics in EFA study (n = 350)

(Cont.)

|  | n   | %    |
|--|-----|------|
| Government employee  | 26  | 7.4  |
| Farmer   | 92  | 26.4 |
| Etc.   |     |      |
| Retired Government employee  | 2   | 0.5  |
| Prisoner   | 1   | 0.3  |
| <b>Monthly income (500-70,000 Baht/Month, <math>\bar{x}</math> 10,586.31, SD 10583.81)</b> |     |      |
| < 10,000 baht  | 237 | 67.7 |
| 10,001 – 30,000 baht   | 96  | 27.4 |
| 30,001 – 50,000 baht   | 16  | 4.6  |
| > 50,000 baht  | 1   | 0.3  |
| <b>Right to treatment</b>  |     |      |
| Civil Servant  | 47  | 13.4 |
| Social Security Benefits   | 61  | 17.4 |
| Gold Card 30 Baht  | 241 | 68.9 |
| State Welfare  | 1   | 0.3  |
| <b>Side of Breast cancer</b>   |     |      |
| Left breast cancer   | 194 | 55.4 |
| Right breast cancer  | 156 | 44.6 |
| <b>Stage of breast cancer</b>  |     |      |
| Invasive breast cancer   | 243 | 69.4 |
| Advanced invasive breast cancer  | 107 | 30.6 |
| <b>Operation</b>   |     |      |
| Breast has been removed  | 267 | 76.3 |
| Breast has not been removed  | 83  | 23.7 |
| <b>Chemotherapy regimen</b>  |     |      |
| AC regimen   | 207 | 59.2 |
| FAC regimen  | 46  | 13.1 |
| CMF regimen  | 15  | 4.3  |
| TC regimen   | 1   | 0.3  |
| Paclitaxel regimen   | 40  | 11.4 |
| Herceptin regimen  | 21  | 6.0  |
| Pac/Her regimen  | 16  | 4.6  |
| Docetaxel regimen  | 4   | 1.1  |
| <b>Course of chemotherapy</b>  |     |      |
| First-line chemotherapy  | 278 | 79.5 |
| Second-line chemotherapy   | 68  | 19.4 |
| Third-line chemotherapy  | 4   | 1.1  |

**Table 19** Demographic and Clinical Characteristics in EFA study (n = 350)

(Cont.)

|  | n   | %    |
|--|-----|------|
| <b>Cycle of chemotherapy (No 1 – 18, <math>\bar{x}</math> 3.49, SD 2.50)</b> |     |      |
| No 1   | 63  | 18.0 |
| No 2 - 5   | 237 | 67.7 |
| No 5 - 10  | 42  | 12   |
| No 11 -15  | 6   | 1.7  |
| > No 15  | 2   | 0.6  |
| <b>Duration of receiving chemotherapy</b>                                    |     |      |
| < 3 months   | 242 | 69.1 |
| 3 – 6 months   | 79  | 22.6 |
| 6 – 9 months   | 16  | 4.6  |
| 9 – 12 months  | 10  | 2.8  |
| > 12 months  | 3   | 0.9  |

## 2. Reliability before EFA analysis consists of:

2.1 Reliability signifying Internal consistency reliability of the whole questionnaire with Cronbach's Alpha of 0.967 (Appendix I) and Item-total correlation between 0.154 (item 44) – 0.724 (item 47). Considering by item, it was found that there was one item with Item-total correlation less than 0.2, that is, Item no.44 *"I need my boyfriend/husband to understand my limitations in sexual relationship caused by the disease and side effects of the treatment"* which had Item-total correlation value of 0.154. The researchers deleted this item from the questionnaire (Table 20).

## 2.2 Result of item analysis

2.2.1 A Correlation matrix of all 55 items showed that there were eight items with correlation less than 0.3 - more than 27 values (50% of number of Correlation pairs in each item) - Item no. 2, 5, 10, 17, 23, 32, 35, and 44. Considering by item, it was found that Item no. 23 and 35 had the high average value of significant need and necessity for Thai women with breast cancer undergoing

chemotherapy (3.66 and 3.72, respectively). Thus these two questions were kept. The researchers deleted six questions - Item no. 2, 5, 10, 17, 32, and 44 (Table 20) there were 49 question items left.

2.2.2 A Correlation matrix of all 55 items showed that there were eight pairs of item with correlation higher than 0.7 (Appendix I). This indicated that these items were very similar in meaning and could be used to substitute one another. The researchers considered suitability, significance, and repetition of each pair of items and found that the less significant item would be deleted from the questionnaire. The researchers deleted six questions - Item no. 15, 30, 43, 45, 47, and 49 (Table 20). So, there were 43 items left for EFA analysis.

After deleting 12 items and keeping 43 items, it was found that the SCNS-TBC had reliability of 0.962 (Appendix I), slightly lower than before (0.967) but still in standard range. The Item total correlation of every item was between 0.4 - 0.7. (Appendix I). The researchers used data from all 43 items of the SCNS-TBC to further analyze construct validity with EFA.

**Table 20** SCNS-TBC items characteristics before EFA (Cronbach's alpha 0.967)

| Item   | Average correlation | Item total correlation | Cronbach's Alpha if deleted | Number of correlation < 0.3 | Number of correlation > 0.7 | Consideration |
|--------|---------------------|------------------------|-----------------------------|-----------------------------|-----------------------------|---------------|
| Item1  | 0.328               | .499                   | .966                        | 22                          | 0                           |               |
| Item2  | 0.261               | .401                   | .967                        | 42                          | 0                           | <u>Delete</u> |
| Item3  | 0.360               | .579                   | .966                        | 15                          | 0                           |               |
| Item4  | 0.398               | .639                   | .966                        | 9                           | 0                           |               |
| Item5  | 0.303               | .487                   | .966                        | 30                          | 0                           | <u>Delete</u> |
|        |                     |                        |                             |                             |                             | Mean 2.78     |
| Item6  | 0.365               | .585                   | .966                        | 16                          | 0                           |               |
| Item7  | 0.435               | .691                   | .966                        | 7                           | 0                           |               |
| Item8  | 0.386               | .627                   | .966                        | 13                          | 0                           |               |
| Item9  | 0.393               | .619                   | .966                        | 11                          | 0                           |               |
| Item10 | 0.282               | .448                   | .967                        | 33                          | 0                           | <u>Delete</u> |
| Item11 | 0.404               | .654                   | .966                        | 11                          | 0                           |               |

**Table 20** SCNS-TBC items characteristics before EFA (Cont.)

| Item   | Average correlation | Item total correlation | Cronbach's Alpha if deleted | Number of correlation < 0.3 | Number of correlation > 0.7 | Consideration  |
|--------|---------------------|------------------------|-----------------------------|-----------------------------|-----------------------------|--|
| Item12 | 0.374               | .593                   | .966                        | 13                          | 0                           |  |
| Item13 | 0.415               | .675                   | .966                        | 10                          | 0                           |  |
| Item14 | 0.354               | .562                   | .966                        | 18                          | 1                           | <u>Keep</u><br>Seems redundant with item 15, better than item 15                                 |
| Item15 | 0.394               | .636                   | .966                        | 15                          | 1                           | <u>Delete</u><br>Seems redundant with item 14, but has less desirable item characteristic        |
| Item16 | 0.371               | .581                   | .966                        | 19                          | 0                           |  |
| Item17 | 0.258               | .389                   | .967                        | 38                          | 0                           | <u>Delete</u>  |
| Item18 | 0.354               | .574                   | .966                        | 21                          | 0                           |  |
| Item19 | 0.453               | .721                   | .966                        | 4                           | 0                           |  |
| Item20 | 0.431               | .684                   | .966                        | 3                           | 0                           |  |
| Item21 | 0.438               | .704                   | .966                        | 5                           | 0                           |  |
| Item22 | 0.428               | .681                   | .966                        | 7                           | 0                           |  |
| Item23 | 0.303               | .449                   | .967                        | 32                          | 0                           | <u>Keep</u><br>Because this item has the highest level of significant need at an average of 3.66 |
| Item24 | 0.384               | .594                   | .966                        | 17                          | 0                           |  |
| Item25 | 0.429               | .676                   | .966                        | 4                           | 0                           |  |
| Item26 | 0.356               | .544                   | .966                        | 21                          | 0                           |  |
| Item27 | 0.376               | .589                   | .966                        | 12                          | 0                           |  |
| Item28 | 0.319               | .496                   | .966                        | 26                          | 0                           |  |
| Item29 | 0.438               | .689                   | .966                        | 5                           | 1                           | <u>Keep</u><br>Seems redundant with item 30,   |

**Table 20** SCNS-TBC items characteristics before EFA (Cont.)

| Item   | Average correlation | Item total correlation | Cronbach's Alpha if deleted | Number of correlation < 0.3 | Number of correlation > 0.7 | Consideration   |
|--------|---------------------|------------------------|-----------------------------|-----------------------------|-----------------------------|---|
| Item30 | 0.436               | .692                   | .966                        | 7                           | 1                           | better than item 30<br><u>Delete</u><br>Seems redundant with item 29, but has less desirable item characteristic                    |
| Item31 | 0.360               | .552                   | .966                        | 17                          | 0                           |   |
| Item32 | 0.312               | .460                   | .967                        | 28                          | 0                           | <u>Delete</u><br>Because the item asks overall need "I need suggestions on behaviors that will help me cured from my breast cancer" |
| Item33 | 0.386               | .593                   | .966                        | 13                          | 0                           |   |
| Item34 | 0.358               | .540                   | .966                        | 19                          | 0                           |   |
| Item35 | 0.322               | .490                   | .966                        | 30                          | 0                           | <u>Keep</u><br>Because this item has the highest level of significant need at an average of 3.72                                    |
| Item36 | 0.321               | .507                   | .966                        | 25                          | 0                           |   |
| Item37 | 0.329               | .510                   | .966                        | 22                          | 0                           |   |
| Item38 | 0.362               | .575                   | .966                        | 13                          | 0                           |   |
| Item39 | 0.356               | .567                   | .966                        | 20                          | 0                           |   |
| Item40 | 0.420               | .693                   | .966                        | 9                           | 0                           |   |

**Table 20** SCNS-TBC items characteristics before EFA (Cont.)

| Item   | Average correlation | Item total correlation | Cronbach's Alpha if deleted | Number of correlation < 0.3 | Number of correlation > 0.7 | Consideration   |
|--------|---------------------|------------------------|-----------------------------|-----------------------------|-----------------------------|---|
| Item41 | 0.424               | .692                   | .966                        | 9                           | 1                           | <u>Keep</u><br>Seems redundant with item 43, better than item 43                                      |
| Item42 | 0.428               | .690                   | .966                        | 9                           | 2                           | <u>Keep</u><br>Seems redundant with item 42, 43, and 47, best among item 42, 43, and 47               |
| Item43 | 0.439               | .711                   | .966                        | 8                           | 2                           | <u>Delete</u><br>Seems redundant with item 41, 42, and 43, but has less desirable item characteristic |
| Item44 | 0.112               | .154                   | .968                        | 54                          | 0                           | <u>Delete</u>   |
| Item45 | 0.374               | .615                   | .966                        | 18                          | 1                           | <u>Delete</u><br>Seems redundant with item 46, but has less desirable item characteristic             |
| Item46 | 0.357               | .589                   | .966                        | 19                          | 1                           | <u>Keep</u><br>Seems redundant with item 45, better than item 45                                      |

**Table 20** SCNS-TBC items characteristics before EFA (Cont.)

| Item   | Average correlation | Item total correlation | Cronbach's Alpha if deleted | Number of correlation < 0.3 | Number of correlation > 0.7 | Consideration   |
|--------|---------------------|------------------------|-----------------------------|-----------------------------|-----------------------------|---|
| Item47 | 0.444               | .724                   | .966                        | 8                           | 2                           | <u>Delete</u><br>Seems redundant with item 42, 47, and 48, but has less desirable item characteristic |
| Item48 | 0.439               | .719                   | .966                        | 10                          | 1                           | <u>Keep</u><br>Seems redundant with item 47, better than item 47                                      |
| Item49 | 0.369               | .613                   | .966                        | 21                          | 1                           | <u>Delete</u><br>Seems redundant with item 50, but has less desirable item characteristic             |
| Item50 | 0.357               | .585                   | .966                        | 22                          | 1                           | <u>Keep</u><br>Seems redundant with item 49, better than item 49                                      |
| Item51 | 0.417               | .674                   | .966                        | 8                           | 0                           |   |
| Item52 | 0.395               | .644                   | .966                        | 10                          | 0                           |   |
| Item53 | 0.395               | .648                   | .966                        | 11                          | 0                           |   |
| Item54 | 0.330               | .537                   | .966                        | 21                          | 0                           |   |
| Item55 | 0.312               | .489                   | .966                        | 27                          | 0                           |   |



### 3. Exploratory Factor Analysis (EFA)

In this step, all 43 items of the SCNS-TBC used to analyze EFA. Thus, before EFA analysis, the researchers had checked all data by assessing data distribution. It was found that there were 39/43 indicators (90.69%) with skewness of -1 to 1, which indicated normal distribution of data (Appendix I).

EFA was analyzed by the Principle Components Analysis (PCA) method and the Orthogonal Rotation with Varimax with Kaiser Normalization method which the researchers chose to analyze EFA with normal curve of data distribution.

#### 3.1 Kaiser-Meyer-Olkin (KMO)

The EFA analysis began with Assumption testing for factor analysis. Results showed that the KMO coefficient for this dataset was .935 and the Bartlett test of Sphericity was statistically significant ( $X^2 = 10357.343$ ,  $df. = 903$ ,  $P < .001$ ) (Table 21). This indicated that properties of the correlation matrix justified factor analysis being carried out. Moreover, the first order of principle component analysis (PCA) showed that communalities in all items were above .50 (.565 - .788). Item 37 (.565) and Item 48 (.788) were acceptable for further analysis (Appendix I).

**Table 21** KMO and Bartlett's Test (n = 350)

|   |                    |           |
|---|--------------------|-----------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy |                    | .935      |
| Bartlett's Test of Sphericity                   | Approx. Chi-Square | 10357.343 |
|   | d.f.               | 903       |
|   | Sig.               | .000      |

#### 3.2 Factor extraction

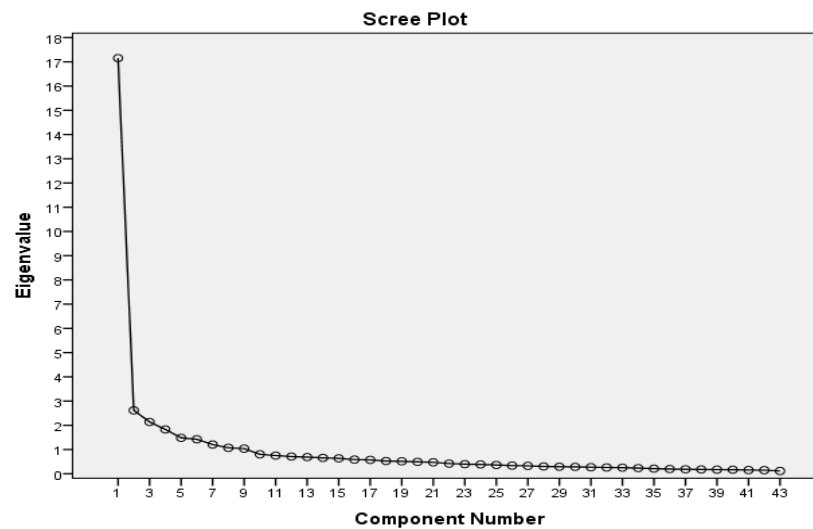
The factor extraction in this study used the Principle Components Analysis (PCA) and the Orthogonal Rotation with Varimax with Kaiser Normalization methods. The researchers used three criteria to choose number of

component: 1) an eigenvalue greater than one, 2) scree plot characteristics, and 3) an accumulative percentage of variance criteria greater than 60% (Hayton, Allen, & Scarpello, 2004).

Results of the analysis showed that there were nine latent factors with Eigenvalue between 1.037 - 17.151. Component 1 could best explain variation of data at 39.887 percent and component 2 – 9 could similarly explain data variation between 1.037 - 2.615. Every component could explain data variation at 69.658% Cumulative variance (Table 22). However, extraction of factors was based both upon Kaiser's criterion for Eigenvalues of equal to or greater than unity and Scree Plot visual interpretation (Figure 4). Screen plot showed the leveling-off point of the eigenvalue was in the 8th-9th components.

**Table 22** Eigenvalue in EFA study

| Component | Eigenvalue | % of Variance | % of Cumulative |
|-----------|------------|---------------|-----------------|
| 1         | 17.151     | 39.887        | 39.887          |
| 2         | 2.615      | 6.083         | 45.970          |
| 3         | 2.138      | 4.973         | 50.943          |
| 4         | 1.828      | 4.251         | 55.194          |
| 5         | 1.482      | 3.446         | 58.640          |
| 6         | 1.424      | 3.312         | 61.951          |
| 7         | 1.205      | 2.803         | 64.754          |
| 8         | 1.072      | 2.492         | 67.246          |
| 9         | 1.037      | 2.412         | 69.658          |



**Figure 4** Scree Plot

### 3.3 Factor loading

After analysis of factor loading, the researchers used three criteria to delete question items: 1) component weight lower than 0.3, 2) remaining questions must not less than three items, and 3) meaning of questions should be able to grouped together in the same component.

Results of this research indicate that every question item has factor loading higher than 0.3 and could be grouped into any component. Moreover, analysis results also reveal that there are 29 items with factor loading higher than 0.3 that could be grouped into more than one components. However, to consider each component, the researchers had to choose the highest factor loading of each item in that component, including consideration about number of question in each component and meaning of questions that could be grouped together. Therefore, every question passed all of the above three criteria. The researchers kept all the remaining question items with eight components as shown in Table 23 – 30.

### 3.3.1 Component 1: Financial support

Financial support consists of six items (item 18, 53, 54, 52, 51, and 25) which have factor loading between .339 - .793. This component has overall component variance of 17.151 or 39.887 percent of the total variance and reliability coefficient of .863 as presented in Table 23.

**Table 23** Number of item and factor loading of Financial support

|                                     | Item   | Factor loading |
|-------------------------------------|--|----------------|
| 1                                   | i18 Support from governmental welfare about other expenses in getting chemotherapy | .793           |
| 2                                   | i53 Support of work/career to increase income                                      | .741           |
| 3                                   | i54 Assistance from family and cousins in reserved money                           | .728           |
| 4                                   | i52 Support from hospital about necessary supplement protein                       | .701           |
| 5                                   | i51 Support from hospitals about wings, hats, turbans                              | .352           |
| 6                                   | i25 Support about treatment right  | .339           |
| Eigenvalue = 17.151                 |  |                |
| % of Variance = 39.887              |  |                |
| Cronbach's Alpha Coefficient = .863 |  |                |

### 3.3.2 Component 2: Self-care advice

Self-care advice consists of five items (item 35, 34, 33, 31, and 37) which have factor loading between .599 - .723. This component has overall component variance of 2.615 or 6.083 percent of the total variance and reliability coefficient of .821, as shown in Table 24.

**Table 24** Number of item and factor loading of Self-care advice

|                                     | Item  | Factor loading |
|-------------------------------------|---|----------------|
| 1                                   | i35 Suggestions about suitable types of food                                  | .723           |
| 2                                   | i34 Suggestions about use of arm on the operated side                         | .703           |
| 3                                   | i33 Suggestions about doing activities/work in daily life                     | .667           |
| 4                                   | i31 Suggestions about behavior that promotes normal blood examination results | .608           |
| 5                                   | i37 Exchange of self-care experience with fellow patients                     | .599           |
| Eigenvalue = 2.615                  |   |                |
| % of Variance = 6.083               |   |                |
| Cronbach's Alpha Coefficient = .821 |   |                |

### 3.3.3 Component 3: Family support

Family support consists of seven items (item 48, 42, 41, 50, 46, 39, and 40) which have factor loading between .469 - .669. This component has overall component variance of 2.138 or 4.973 percent of the total variance and reliability coefficient of .884, as shown in Table 25.

**Table 25** Number of item and factor loading of Family support

|                                     | Item  | Factor loading |
|-------------------------------------|---|----------------|
| 1                                   | i48 Acceptance from family about changing physical condition              | .669           |
| 2                                   | i42 Assistance from family in doing housework                             | .664           |
| 3                                   | i41 Care from family in preparing food                                    | .654           |
| 4                                   | i50 Support from family in taking to make merit                           | .604           |
| 5                                   | i46 Encouragement from family   | .545           |
| 6                                   | i39 Assistance for insomnia   | .506           |
| 7                                   | i40 House visit by volunteers and nearby nurses to promote care by family | .469           |
| Eigenvalue = 2.138                  |   |                |
| % of Variance = 4.973               |   |                |
| Cronbach's Alpha Coefficient = .884 |   |                |

### 3.3.4 Component 4: Awareness of disease and treatment

Awareness of disease and treatment consists of seven items (item 26, 24, 1, 9, 16, 29, and 23) which have factor loading between .431 - .727. This component has overall component variance of 1.828 or 4.251 percent of the total variance and reliability coefficient of .849, as shown in Table 26.

**Table 26** Number of item and Factor loading of Awareness of disease and treatment

|                                     | Item   | Factor loading |
|-------------------------------------|--|----------------|
| 1                                   | i26 Explanation about treatment method and progress of the disease | .727           |
| 2                                   | i24 Explanation about treatment approach and duration              | .624           |
| 3                                   | i1 Expertise of nurse in injecting vein to give chemotherapy       | .587           |
| 4                                   | i9 Explanation by doctor/nurse with polite words                   | .526           |
| 5                                   | i16 Getting examination and chemotherapy within the same day       | .500           |
| 6                                   | i29 Explanation about side effects of chemotherapy                 | .488           |
| 7                                   | i23 Explanation about types and severity of breast cancer          | .431           |
| Eigenvalue = 1.828                  |  |                |
| % of Variance = 4.251               |  |                |
| Cronbach's Alpha Coefficient = .849 |  |                |

### 3.3.5 Component 5: Family involvement activities

Family involvement activities consists of five items (item 13, 12, 14, 11, and 21) which have factor loading between .504 - .666. This component has overall component variance of 1.482 or 3.446 percent of the total variance and reliability coefficient of .853, as shown in Table 27.

**Table 27** Number of items and factor loading of Family involvement activities

|                                     | Item   | Factor loading |
|-------------------------------------|--|----------------|
| 1                                   | i13 Family reminds about appointment date for examination and chemotherapy                 | .666           |
| 2                                   | i12 Family involves in getting information and making decision about illness and treatment | .654           |
| 3                                   | i14 Family takes to and from hospitals and accompanies while getting chemotherapy          | .647           |
| 4                                   | i11 Family accompanies into examination room to see doctor                                 | .548           |
| 5                                   | i21 Doctor/nurse acts as mediator for family   | .504           |
| Eigenvalue = 1.482                  |  |                |
| % of Variance = 3.446               |  |                |
| Cronbach's Alpha Coefficient = .853 |  |                |

### 3.3.6 Component 6: Consult with professional

Consult with professional consists of four items (item 55, 22, 19, and 20) which have factor loading between .451 - .715. This component has overall component variance of 1.424 or 3.312 percent of the total variance and reliability coefficient of .802, as shown in Table 28.

**Table 28** Number of item and factor loading of Consult with professional

|                                     | Item   | Factor loading |
|-------------------------------------|--|----------------|
| 1                                   | i55 24-hour phone consulting service                                 | .715           |
| 2                                   | i22 Information and inquiry service while waiting to see the doctor  | .587           |
| 3                                   | i19 Allocating time for doctor/nurse to explain and give suggestions | .484           |
| 4                                   | i20 Personal individual consulting service                           | .451           |
| Eigenvalue = 1.424                  |  |                |
| % of Variance = 3.312               |  |                |
| Cronbach's Alpha Coefficient = .802 |  |                |

### 3.3.7 Component 7: Information on complementary care

Information on complementary care consists of three items (item 28, 27, and 36) which have factor loading between .472 - .806. This component has overall variance of 1.205 for component 7 or 2.803 percent of the total variance and 1.037 for component 9 or 2.412 of the total variance and reliability coefficient of .765, as shown in Table 29

**Table 29** Number of item and Factor loading of Information on complementary care

|                                     | Item   | Factor loading |
|-------------------------------------|--|----------------|
| 1                                   | i28 Information about use of herbs while undergoing chemotherapy         | .806           |
| 2                                   | i27 Information about alternative treatment methods besides chemotherapy | .627           |
| 3                                   | i36 Information about supplementary food, vitamins and food replacement  | .472           |
| Eigenvalue = 2.242                  |  |                |
| % of Variance = 5.215               |  |                |
| Cronbach's Alpha Coefficient = .765 |  |                |

### 3.3.8 Component 8: Symptomatic relieving and care concern

Symptomatic relieving and care concern consists of six items (item 3, 4, 7, 8, 38, and 6) which have factor loading between .404 - .751. This component has overall component variance of 1.072 or 2.492 of the total variance and reliability coefficient of .846, as shown in Table 30.



**Table 30** Number of item and factor loading of Symptomatic relieving and care concern

|                                     | Item   | Factor loading |
|-------------------------------------|--|----------------|
| 1                                   | i3 Alleviation of undesirable symptoms while undergoing chemotherapy | .751           |
| 2                                   | i4 Assistance to toilet while undergoing chemotherapy                | .607           |
| 3                                   | i7 Burning sensation at injection area of chemotherapy               | .536           |
| 4                                   | i8 Alleviation of throat irritation from odor of chemotherapy        | .508           |
| 5                                   | i38 Alleviation of nausea from chemotherapy                          | .491           |
| 6                                   | i6 Periodical check-up by nurses while undergoing chemotherapy       | .404           |
| Eigenvalue = 1.072                  |  |                |
| % of Variance = 2.492               |  |                |
| Cronbach's Alpha Coefficient = .846 |  |                |

After EFA process, SCNs for Thai women with breast cancer undergoing chemotherapy could be categorized into eight significant components that needed help, support, and solution. These component were: 1) financial support (6 items), 2) self-care advice (5 items), 3) family support (7 items), 4) awareness of disease and treatment (7 items), 5) family involvement activities (5 items), 6) consult with professional (4 items), 7) information on complementary care (3 items), and 8) symptomatic relieving and care concern (6 items). So, the researchers could specify the following operational definition of SCNs for Thai women with breast cancer undergoing chemotherapy.

### ***The operational definition of SCNs***

SCNs as perceived by Thai women with breast cancer undergoing chemotherapy refer to critical condition of body and mind changes, as well as issues that creates deficiency and guidelines/ methods for solving problems with remedy, assistance and necessary responses from family and health care team while undergoing chemotherapy. This includes the duration from before, while to after undergoing each cycle of chemotherapy of Thai women with breast cancer which covers eight components: 1) financial support, 2) self-care advice, 3) family support, 4) awareness of disease and treatment, 5) family involvement activities, 6) consult with professional, 7) information on complementary care, and 8) symptomatic relieving and care concern, to maintain balance in normal living. Supportive care needs could be evaluated with the SCNS-TBC (43 items).

### ***Components and definition by aspect of SCNs for Thai women with breast cancer undergoing chemotherapy***

From the above definition and results of EFA study, the SCNs could be classified into eight components as mentioned above. Each component has its operational definition as shown in Table 31.

**Table 31** Components and definition by aspect of SCNs

| Component                             | Definition  |
|---------------------------------------|---|
| 1. Financial support                  | Financial support refers to problems-solving occurred from lack of money which leads to needs for assistance from family members concerning reserve money when necessary, explanation about treatment right coverage for cancer patients, and support from hospitals concerning additional expense besides treatment, such as supplement food, wigs, and career support to compensate for income loss.  |
| 2. Self-care advice                   | Self-care advice refers to guidelines for necessary behavior to help in daily self-care practice during chemotherapy treatment. This includes suggestions for food that should be eaten and should be avoided. It also covers suggestions for use of the arm on breast cancer side, daily activities that can be done, behavior that helps increase blood cells to normal level for continuous reception of chemotherapy, and exchange of suggestions about self-care with other people with similar direct experience. |
| 3. Family support                     | Family support refers to assistance and support of family members during recovery at home concerning problems with body, mind and changing emotion due to impacts of the disease and chemotherapy, covering needs for dealing with insomnia, preparing food, doing duty and errand for patients, taking patients to make merits, understanding and accepting of changes from family members, and visiting by nearby nurses to enhance care by family.   |
| 4. Awareness of disease and treatment | Awareness of disease and treatment refers to caring approach, suggestions, and important information necessary for getting supportive care from doctors and nurses. This includes encouragement and explanation about severity of disease, progress and curing approach they receive, side effects of chemotherapy, as well as blood drawing process, vein injection for chemotherapy, and appointments for treatment.  |

**Table 31** Components and definition by aspect of SCNs (Cont.)

| Component                                 | Definition   |
|---|--|
| 5. Family involvement activities          | Family involvement activities refers to approaches or methods that family can participate in care, acknowledgement and decision-making, as well as reminding before appointment date, taking patients to and from hospitals, participating in hearing and making decision about treatment.   |
| 6. Consult with professional              | Consult with professional refers to communication approaches or methods in enquiry for important and necessary information to deal with several problems. These consist of 24-hour consultant service, answers of inquiry while waiting to see doctors, allocation of time for explanation, and personal consultation.                           |
| 7. Information on complementary care      | Information on alternatives care refers to important and necessary information concerning alternative treatment and care, such as herbs, other alternative cures, and choices of supplement food and vitamins.   |
| 8. Symptomatic relieving and care concern | Care during chemotherapy refers to several approaches or cares from doctors, nurses, and family while undergoing chemotherapy at hospitals. This includes relief from nausea and pain from injection, periodical check by nurses, assistance in going to toilet, convenience while lying down to receive chemotherapy, and herbal drink service. |

#### 4. Reliability after EFA

After EFA process, it was found that, among 55 items of the SCNS-TBC (Draft 3), 12 items were deleted for suitability of EFA with the PCA and the Orthogonal Rotation with Varimax with Kaiser Normalization method. As a result of analysis, the SCNS-TBC (Draft 4) consisted of 43 items in eight major components: 1) financial support, 2) self-care advice, 3) family support, 4) awareness of disease

and treatment, 5) family involvement activities, 6) consult with professional, 7) information on complementary care, and 8) symptomatic relieving and care concern, with Cronbach's Alpha by version of .962 (Appendix I). It was also found that family support had the highest reliability of .884 while information about alternatives had the lowest reliability of .765 (Table 32).

**Table 32** Cronbach's Alpha by component and by version of SCNS-TBC

| component | Number. Of item | Cronbach's Alpha | Mean (SD)          | Range of Item-total correlation | Range of possible score | Range of actual score |
|-----------|-----------------|------------------|--------------------|---------------------------------|-------------------------|-----------------------|
| 1         | 6               | .863             | 18.11<br>(4.833)   | .561 - .754                     | 6 - 24                  | 6 - 24                |
| 2         | 5               | .821             | 17.58<br>(2.527)   | .519 - .711                     | 5 - 20                  | 5 - 20                |
| 3         | 7               | .884             | 20.48<br>(5.309)   | .563 - .764                     | 7 - 28                  | 7 - 28                |
| 4         | 7               | .849             | 24.81<br>(3.448)   | .506 - .709                     | 7 - 28                  | 11 - 28               |
| 5         | 5               | .853             | 15.82<br>(3.601)   | .573 - .726                     | 5 - 20                  | 5 - 20                |
| 6         | 4               | .802             | 12.72<br>(2.851)   | .497 - .706                     | 4 - 16                  | 5 - 16                |
| 7         | 3               | .765             | 9.57<br>(2.261)    | .483 - .691                     | 3 - 12                  | 3 - 12                |
| 8         | 6               | .846             | 17.11<br>(4.526)   | .524 - .701                     | 6 - 24                  | 6 - 24                |
| Total     | 43              | .962             | 136.20<br>(23.925) | .456 - .727                     | 43 - 172                | 57 - 172              |

***Step 8: Testing psychometric properties of SCNS-TBC***

The SCNS-TBC (Draft 4) which consisted of eight components of 43 items was analyzed for construct validity with Confirmatory Factor Analysis (CFA). The main purpose was to check consistency and confirmed categorization of the SCNS-TBC from EFA analysis. The analyzed questionnaire was used to collect data from 352 Thai women with breast cancer undergoing chemotherapy at eight super tertiary cancer units: Lampang Hospital, Lampang Cancer Hospital, Chonburi Cancer Hospital, Lopburi Cancer Hospital, Saraburi Hospital, Udon Thani Cancer Hospital, Udon Thani Hospital, and Surat Thani Cancer Hospital. These hospitals were randomized from all units in every region of the country and passed research in human ethical consideration. Data were collected from January to March 2019.

*Note:* The sample group in this step is not the same group as in the EFA. Data were collected from a new sample group which, from calculation of sample size of this step in Chapter III, consists of 345 persons. But in real data collection, the researchers and research assistants could collect data from 352 persons. Therefore, in this step, data were analyzed from a total group of 352 persons from eight data sources randomized and presented in Chapter III. Research ethic consent was given from all eight hospitals.

Before data analysis, the researchers checked outliers of data that might affect error in data analysis. Results showed that there was no outliers of data in any questionnaire. Number of samples in this analysis was 352 persons. Results of the analysis were presented in three parts: 1) General information, 2) Confirmatory Factor Analysis (CFA), 3) Reliability, and 4) Prevalence and intensity of SCNs.

### 1. General information about characteristics of sample group

The demographic and clinical characteristics of 352 samples is shown in Table 33. It was found that the majority of participants were 41 to 60 years (62.8%) with an average of 51.6 years (SD 10.41). Most were married (71.3%) and all were Buddhists (99.1%). Most had primary education (49.4%). Most samples were unemployed (28.4%). Most had income less than 10,000 baht per month (63.9%) and used treatment right with 30-baht Gold Card (56.5%).

Most of the sample were diagnosed with left breast cancer (51.4%) in invasive stage (76.7%) and were operated before receiving chemotherapy (83.0%). Most patients received AC regimen chemotherapy (59.4%) (Doxorubicin and Cyclophosphamide). Most samples received first-line chemotherapy (69.0%) between the 2nd and 5th cycle (55.4%) for a period of less than 3 months (61.1%).

**Table 33** Demographic and Clinical Characteristics in CFA study (n = 352)

|  | n   | %    |
|--|-----|------|
| <b>Age, years (26 – 84 years, <math>\bar{x}</math> 51.6 , SD 10.408)</b> |     |      |
| 20 – 40  | 53  | 15.1 |
| 41 - 60  | 221 | 62.8 |
| > 60   | 78  | 22.1 |
| <b>Status</b>  |     |      |
| Single   | 38  | 10.8 |
| Married  | 251 | 71.3 |
| Widowed  | 38  | 10.8 |
| Divorced   | 25  | 7.1  |
| <b>Religion</b>  |     |      |
| Buddhism   | 349 | 99.1 |
| Islamism   | 3   | 0.9  |
| <b>Region</b>  |     |      |
| Northern   | 78  | 22.2 |
| Northeast  | 80  | 22.7 |
| Central  | 134 | 38.1 |
| Southern   | 60  | 17.0 |

**Table 33** Demographic and Clinical Characteristics in CFA study (n = 352)  
(Cont.)

|  | n   | %    |
|--|-----|------|
| <b>Education Level</b>   |     |      |
| Unschooling  | 14  | 4.0  |
| Primary  | 174 | 49.4 |
| Junior secondary   | 33  | 9.4  |
| Senior secondary or vocational certificate   | 32  | 9.1  |
| Diploma  | 22  | 6.3  |
| Bachelor's degree  | 59  | 16.7 |
| Upper Bachelor's degree  | 18  | 5.1  |
| <b>Occupation</b>  |     |      |
| No working   | 100 | 28.4 |
| Merchant   | 38  | 10.7 |
| Temporary worker   | 57  | 16.2 |
| Business owner   | 15  | 4.3  |
| Company employee   | 36  | 10.2 |
| State enterprise officer   | 3   | 0.9  |
| Government employee  | 46  | 13.1 |
| Farmer   | 57  | 16.2 |
| <b>Monthly income (200-500,000 Baht/Month, <math>\bar{x}</math> 15,164.12, SD 39754.803)</b> |     |      |
| < 10,000 baht  | 225 | 63.9 |
| 10,001 – 30,000 baht   | 91  | 25.9 |
| 30,001 – 50,000 baht   | 26  | 7.4  |
| > 50,000 baht  | 10  | 2.8  |
| <b>Right to treatment</b>  |     |      |
| Civil Servant  | 67  | 19.0 |
| Social Security Benefits   | 85  | 24.1 |
| Gold Card 30 Baht  | 199 | 56.6 |
| Ect. (Disabled person)   | 1   | 0.3  |
| <b>Side of Breast cancer</b>   |     |      |
| Left breast cancer   | 181 | 51.4 |
| Right breast cancer  | 167 | 47.5 |
| Both side  | 4   | 1.1  |
| <b>Stage of breast cancer</b>  |     |      |
| Invasive breast cancer   | 270 | 76.7 |
| Advanced invasive breast cancer  | 82  | 23.3 |
| <b>Operation</b>   |     |      |
| Breast has been removed  | 292 | 83.0 |
| Breast has not been removed  | 60  | 17.0 |



**Table 33** Demographic and Clinical Characteristics in CFA study (n = 352) (Cont.)

|  | n   | %    |
|--|-----|------|
| <b>Chemotherapy regimen</b>  |     |      |
| AC regimen   | 209 | 59.4 |
| FAC regimen  | 22  | 6.3  |
| CMF regimen  | 10  | 2.8  |
| TC regimen   | 1   | 0.3  |
| Paclitaxel regimen   | 43  | 12.2 |
| Herceptin regimen  | 35  | 9.9  |
| Pac/Her regimen  | 19  | 5.4  |
| Docetaxel regimen  | 13  | 3.7  |
| <b>Course of chemotherapy</b>  |     |      |
| First-line chemotherapy  | 243 | 69.0 |
| Second-line chemotherapy   | 104 | 29.5 |
| Third-line chemotherapy  | 5   | 1.5  |
| <b>Cycle of chemotherapy (No 1 – 18, <math>\bar{x}</math> 3.49, SD 2.50)</b> |     |      |
| No 1   | 96  | 27.3 |
| No 2 - 5   | 195 | 55.4 |
| No 5 - 10  | 57  | 14.4 |
| No 11 -15  | 8   | 2.3  |
| > No 15  | 2   | 0.6  |
| <b>Duration of receiving chemotherapy</b>                                    |     |      |
| < 3 months   | 215 | 61.1 |
| 3 – 6 months   | 103 | 29.3 |
| 6 – 9 months   | 17  | 4.7  |
| 9 – 12 months  | 14  | 4.0  |
| > 12 months  | 3   | 0.9  |

## 2. Confirmatory Factor Analysis (CFA)

The CFA in this study aimed to check construct validity of the SCNS-TBC gained from EFA. Results of EFA indicated that the SCNS-TBC could be divided into eight components, consisting of 43 items to input into CFA analysis process. The eight components were: 1) financial support (6 items), 2) self-care advice (5 items), 3) family support (7 items), 4) awareness of disease and treatment (7 items), 5) family

involvement activities (5 items), 6) consult with professional (4 items), 7) information on complementary care (3 items), and 8) symptomatic relieving and care concern (6 items). The CFA helped confirm results of component analysis from the EFA, comparing with empirical data. The researchers present results from testing assumption for CFA and results of CFA, respectively, as follow:

### 2.1 Testing assumption for CFA

Before conducting the CFA, assumption of the CFA statistics was examined, including normality, multicollinearity, Bartlett's test of sphericity, and the Kaiser-Meyer-Olkin Measure of Sampling Adequacy by using IBM SPSS statistical software (version 20). Results of assumption testing showed that data were suitable for conducting the CFA analysis.

#### 2.1.1 Normality testing

The mean scores of the SCNS-TBC ranged from 2.06 to 3.53, with a standard deviation ranging from 0.57 to 1.155. Each item score ranged from 1 to 4. The skewness ranged from -1.199 to .533 and the kurtosis ranged from -1.428 to 1.936. There were 41 items (95.35%) which had skewness within the range of -1 to +1, and the magnitude of the kurtosis was less than 2. These represented item characteristics of normal distribution (Appendix J).

#### 2.1.2 Multicollinearity

Results indicated that the tolerance values were not close to 0 (ranging from .273 to .637) and the variance inflation factor (VIF) values were less than 10 (ranging from 1.570 to 3.657) (Appendix J). The tolerance and VIF values indicated no evidence of multicollinearity (O'Brien, 2007). Therefore, the absence of multicollinearity was accepted.

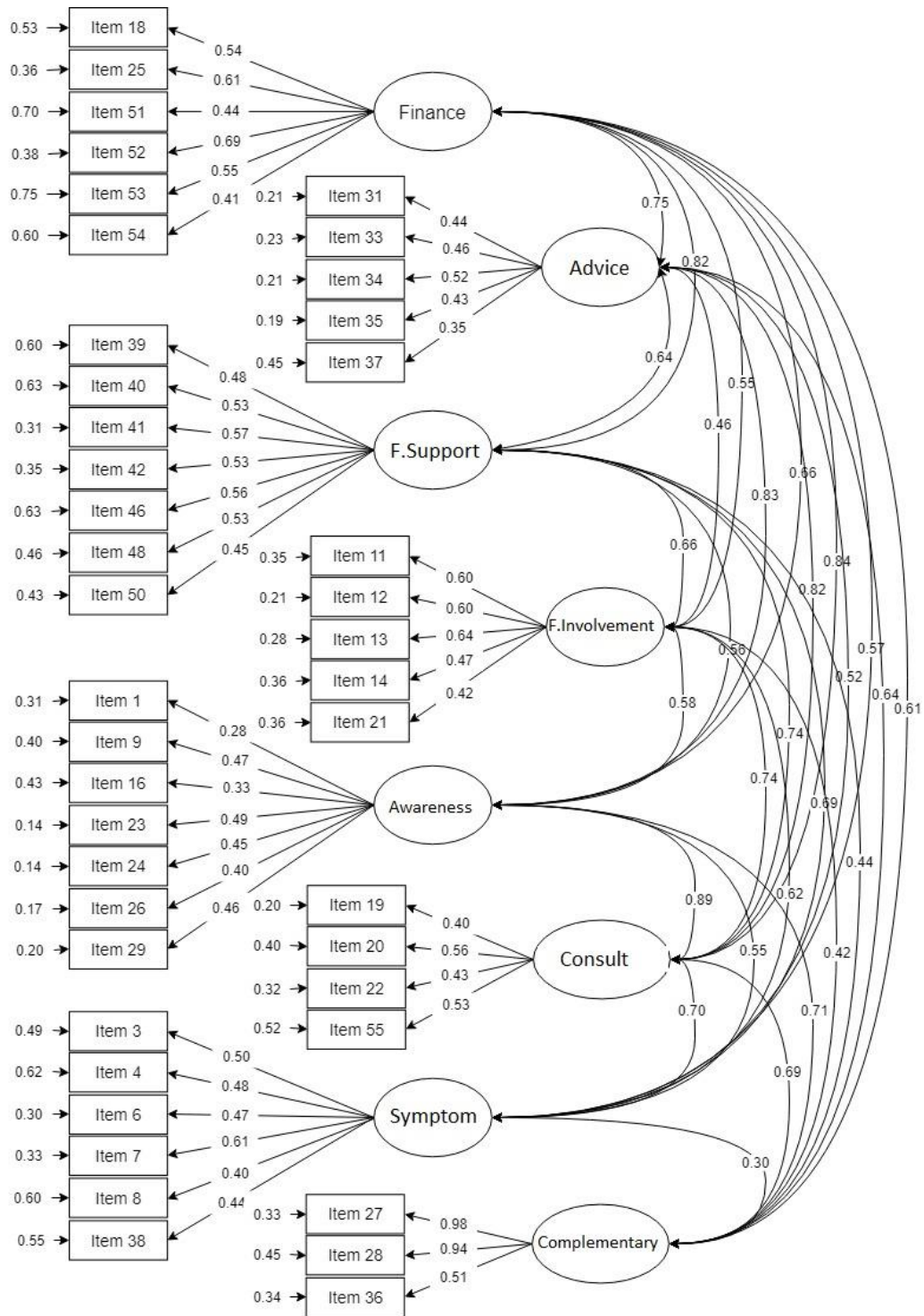
2.1.3 Bartlett's test of sphericity and the Kaiser-Meyer-Olkin of Sampling Adequacy. Results showed that the SCNS-TBC was significant ( $\chi^2 = 7616.449$ ,  $df = 903$  and  $p = .000$ ). That is, the scale had normal multivariate distribution and the correlation matrix was not an identity matrix. Moreover, the Kaiser-Meyer-Olkin (KMO) of sampling adequacy test showed that the size of overall KMO was .919 (Appendix J).

## 2.2 Confirmatory Factor Analysis (CFA)

Results of EFA showed that the SCNS-TBC could be categorized into eight components mentioned above. The analysis result of EFA revealed that there are 29 items with factor loading higher than 0.3 which could be grouped into more than one component. This indicated that there was internal variance in all eight components. Thus, initially, the CFA was based on the previous studied components of eight factors 43 items that affected score of SCNS-TBC. The researchers analyzed with statistical R package "lavaan" by estimating Standardized covariation in order to gain estimation which considered confluence among items within the same factor. Results are shown the initial hypothesized model of SCNS-TBC in Figure 5

### 2.2.1 Assessment of overall model fit

The hypothesized model of the SCNS-TBC was assessed the overall model fit. The results showed unacceptable model fit with the data with Chi-square ( $\chi^2$ ) = 2571.14, p-value (p) = 0.00, degree of freedom (df) = 832, Chi-square/df ( $\chi^2/df$ ) = 3.10, Goodness of Fit Index (Fihn et al.) = 0.727, Comparative Fit Index (CFI) = 0.754, Root Mean Square Error of Approximation (RMSEA) = 0.077, and Standardized Root Mean square Residual (SRMR) = 0.082. It was indicated that the hypothesized model did not fit with empirical data. Therefore, the hypothesized model was modified and retested.



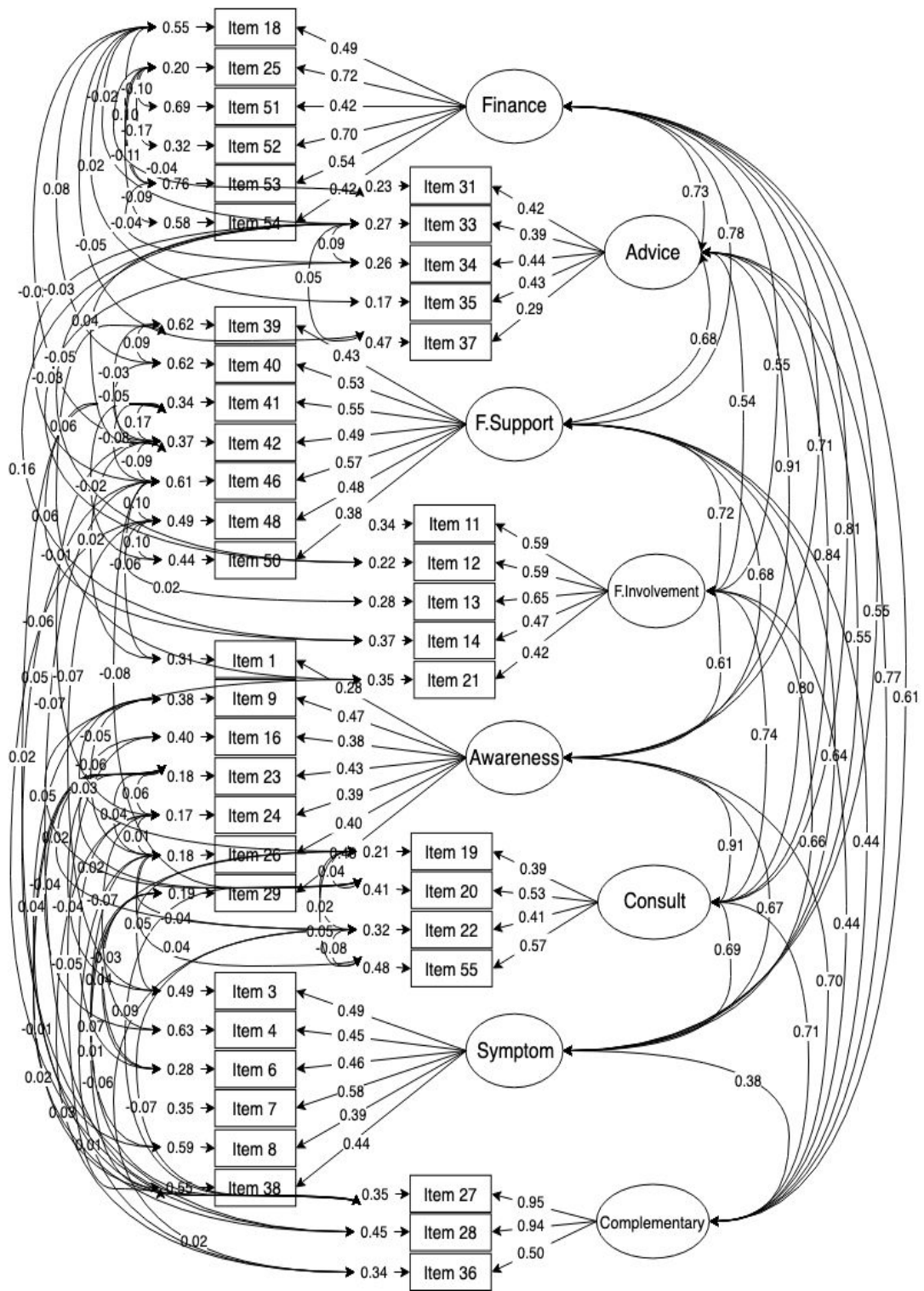
Chi-Square = 2571.14, df = 832, P-value = 0.000, RMSEA = 0.077

**Figure 5** The hypothesized model of SCNS-TBC

### 2.2.2 Model modification

From the hypothesized model of SCNS-TBC, it was found that some item pairs had high level of covariance. The hypothesized model was modified terms in order to reduce the residual values of each indicator by allowing relationships of error terms between possible paired indicators. Thus, the model was adjusted to better suit the data by determining items with covariance from the initial model before repeating the modified model. There were 241 paired indicators where the error possibly correlated. Results are shown the modified model of SCNS-TBC in Figure 6.

After modifying the model, there was edition of highly-related items according to Modification Indices (MI) (Appendix J) until the model's value reached the standard for supporting good fit. The  $\chi^2/df$  ratio fell within the recommended level less than 3, GFI value equal to or greater than 0.90, and RMSEA value less than 0.05. The results of the second-order CFA showed the Chi-square ( $\chi^2$ ) = 862.74, p-value (p) = 0.00, degree of freedom (df) = 591, Chi-square/df ( $\chi^2/df$ ) = 1.5, GFI 0.902, CFI = 0.941, RMSEA = 0.036, and SRMR = 0.060 (Table 34).



Chi-Square = 862.74, df = 591, P-value = 0.000, RMSEA = 0.036

**Figure 6** The modified model of SCNS-TBC

**Table 34** Comparison of the Goodness of Fit Measures between hypothesized model and modified model of the SCNS-TBC (N=352)

| Indexes   | Criteria                   | Hypothesized Model   | Modified Model     |
|---|----------------------------|----------------------|--------------------|
| Chi-square                                      | $\frac{\chi^2}{df} \leq 2$ | 2571.14 / 832 = 3.10 | 862.74 / 591 = 1.5 |
|   | p-value > 0.05             | p-value < 0.001      | p-value < 0.001    |
| Goodness-of-fit index (Fihn et al.)             | $\geq 0.90$                | 0.727                | 0.902              |
| Tucker–Lewis index (TLI)                        | >0.95                      | 0.733                | 0.962              |
| Comparative fit index (CFI)                     | >0.95                      | 0.754                | 0.941              |
| Standardized Root mean square residual (SRMR)   | $\leq 0.08$                | 0.082                | 0.060              |
| Root mean square error of Approximation (RMSEA) | $\leq 0.08$                | 0.077                | 0.036              |

Suitability of model was tested statistically as in Table 34, it was found that CFA of the modified models showed suitability in the ratio of Chi-square and df, GFI, TLI and CFI. Moreover, SRMR, RMSEA were also acceptable. These results indicated that the modified factor structure model was congruent with the empirical data. However, results of model modification in this study to reduce the residual values of each indicator as many as 241 pairs show that certain amount of variables in the newly-constructed SCNS-TBC are highly related. This indicates that construct validity of the SCNS-TBC gained from the EFA study is still different from empirical data gained from the CFA study. Nevertheless, after model modification according to the CFA, it could confirm suitability of construct validity of the SCNS-TBC according to standard criteria.

### 3. Reliability of SCNS-TBC

As a result of analysis, the SCNS-TBC (Final version) consisted of 43 items in eight major components: 1) financial support, 2) self-care advice, 3) family support, 4) awareness of disease and treatment, 5) family involvement activities, 6) consult with professional, 7) information on complementary care, and 8) symptomatic relieving and care concern, with Cronbach's Alpha by version of .941. It was also found that both two components; Awareness of disease and treatment and Family involvement activities had the highest reliability of .817 while Consult with professional had the lowest reliability of .705 (Appendix J) (Table 35)

**Table 35** Reliability of SCNS-TBC 43 items (Final version) (n 352)

| Component  | Number of items | Cronbach's Alpha |
|--|-----------------|------------------|
| <b>1 Financial support</b>   | 6               | .769             |
| 1.1 Support from governmental welfare about other expenses in getting chemotherapy |                 |                  |
| 1.2 Support of work/career to increase income                                      |                 |                  |
| 1.3 Assistance from family and cousins in reserved money                           |                 |                  |
| 1.4 Support from hospital about necessary supplement protein                       |                 |                  |
| 1.5 Support from hospitals about wings, hats, turbans                              |                 |                  |
| 1.6 Support about treatment right  |                 |                  |
| <b>2 Self-care advice</b>  | 5               | .789             |
| 2.1 Suggestions about suitable types of food                                       |                 |                  |
| 2.2 Suggestions about use of arm on the operated side                              |                 |                  |
| 2.3 Suggestions about doing activities/work in daily life                          |                 |                  |
| 2.4 Suggestions about behavior that promotes normal blood examination results      |                 |                  |
| 2.5 Exchange of self-care experience with fellow patients                          |                 |                  |
| <b>3 Family support</b>  | 7               | .795             |
| 3.1 Acceptance from family about changing physical condition                       |                 |                  |
| 3.2 Assistance from family in doing housework                                      |                 |                  |
| 3.3 Care from family in preparing food   |                 |                  |
| 3.4 Support from family in taking to make merit                                    |                 |                  |



**Table 35** Reliability of SCNS-TBC 43 items (Final version) (n 352) (Cont.)

| Component  | Number of items | Cronbach's Alpha |
|--|-----------------|------------------|
| 3.5 Encouragement from family  |                 |                  |
| 3.6 Assistance for insomnia  |                 |                  |
| 3.7 House visit by volunteers and nearby nurses to promote care by family                  |                 |                  |
| <b>4 Awareness of disease and treatment</b>  | 7               | .817             |
| 4.1 Explanation about treatment method and progress of the disease                         |                 |                  |
| 4.2 Explanation about treatment approach and duration                                      |                 |                  |
| 4.3 Expertise of nurse in injecting vein to give chemotherapy                              |                 |                  |
| 4.4 Explanation by doctor/nurse with polite words  |                 |                  |
| 4.5 Getting examination and chemotherapy within the same day                               |                 |                  |
| 4.6 Explanation about side effects of chemotherapy   |                 |                  |
| 4.7 Explanation about types and severity of breast cancer                                  |                 |                  |
| <b>5 Family involvement activities</b>   | 5               | .817             |
| 5.1 Family reminds about appointment date for examination and chemotherapy                 |                 |                  |
| 5.2 Family involves in getting information and making decision about illness and treatment |                 |                  |
| 5.3 Family takes to and from hospitals and accompanies while getting chemotherapy          |                 |                  |
| 5.4 Family accompanies into examination room to see doctor                                 |                 |                  |
| 5.5 Doctor/nurse acts as mediator for family   |                 |                  |
| <b>6 Consult with professional</b>   | 4               | .705             |
| 6.1 24-hour phone consulting service   |                 |                  |
| 6.2 Information and inquiry service while waiting to see the doctor                        |                 |                  |
| 6.3 Allocating time for doctor/nurse to explain and give suggestions                       |                 |                  |
| 6.4 Personal individual consulting service   |                 |                  |
| <b>7 Information on complementary care</b>   | 3               | .808             |
| 7.1 Information about use of herbs while undergoing chemotherapy                           |                 |                  |
| 7.2 Information about alternative treatment methods besides chemotherapy                   |                 |                  |
| 7.3 Information about supplementary food, vitamins and food replacement                    |                 |                  |

**Table 35** Reliability of SCNS-TBC 43 items (Final version) (n 352) (Cont.)

| Component   | Number of items | Cronbach's Alpha |
|---|-----------------|------------------|
| <b>8 Symptomatic relieving and care concern</b>                       | 6               | .741             |
| 8.1 Alleviation of undesirable symptoms while undergoing chemotherapy |                 |                  |
| 8.2 Assistance to toilet while undergoing chemotherapy                |                 |                  |
| 8.3 Burning sensation at injection area of chemotherapy               |                 |                  |
| 8.4 Alleviation of throat irritation from odor of chemotherapy        |                 |                  |
| 8.5 Alleviation of nausea from chemotherapy                           |                 |                  |
| 8.6 Periodical check-up by nurses while undergoing chemotherapy       |                 |                  |
| <b>Total</b>  | <b>43</b>       | <b>.941</b>      |

#### 4. Prevalence and intensity of SCNs

From results of this study, when considered by item, it was found that all 43 items of SCNs of Thai women with breast cancer undergoing chemotherapy had average score between 2.06 – 3.53. In translating results of this questionnaire, the researchers translated resulting level of significance and necessity of assistance needs by Intervals from the range (Wetzel and Greiff, 2018) specified in Chapter III from score levels of 1 – 4 in to three levels of need: low – moderate - high. This means that the range of 1.00 – 2.00 is a low level, 2.01 – 3.00 is a moderate level, and 3.01 – 4.00 is a high level of significance and necessity to gain assistance. This clearly indicates difference needs of supportive care in three levels from low-moderate-high. This translated results could be used to consider suitable responses to SCNs.

Therefore, from results of this study, it was found that all 43 items of SCNs of Thai women with breast cancer undergoing chemotherapy had average score between 2.06 – 3.53 which signified needs in moderate to high level of significance and necessity. It was found that 22 items had average score in moderate level of

significance and necessity and 21 items had average score in high level of significance and necessity. The sample group thought that explanation of treatment approach and duration of chemotherapy treatment were information that the sample group considered as awareness of disease and treatment with the highest average score of 3.53 (SD .584), indicating needs in high level of significance and necessity. On the other hand, needs for house visit by volunteers and nearby nurses to promote care by family had the lowest average score of 2.06 (SD .954), indicating needs in moderate level of significance and necessity, as shown in Table 36.

**Table 36** Mean, standard deviation and SCNs level (n 352)

|          | SCNs   | Mean        | SD           | level    |
|----------|--|-------------|--------------|----------|
| <b>1</b> | <b>Financial support</b>   | <b>2.79</b> | <b>3.777</b> | Moderate |
| i18      | 1.1 Support from governmental welfare about other expenses in getting chemotherapy | 2.97        | .907         | Moderate |
| i53      | 1.2 Support of work/career to increase income                                      | 2.44        | 1.028        | Moderate |
| i54      | 1.3 Assistance from family and cousins in reserved money                           | 2.65        | .881         | Moderate |
| i52      | 1.4 Support from hospital about necessary supplement protein                       | 2.83        | .920         | Moderate |
| i51      | 1.5 Support from hospitals about wings, hats, turbans                              | 2.80        | .947         | Moderate |
| i25      | 1.6 Support about treatment right  | 3.06        | .854         | High     |
| <b>2</b> | <b>Self-care advice</b>  | <b>3.29</b> | <b>2.488</b> | High     |
| i35      | 2.1 Suggestions about suitable types of food                                       | 3.49        | .618         | High     |
| i34      | 2.2 Suggestions about use of arm on the operated side                              | 3.30        | .688         | High     |
| i33      | 2.3 Suggestions about doing activities/work in daily life                          | 3.25        | .668         | High     |
| i31      | 2.4 Suggestions about behavior that promotes normal blood examination results      | 3.35        | .641         | High     |
| i37      | 2.5 Exchange of self-care experience with fellow patients                          | 3.07        | .758         | High     |
| <b>3</b> | <b>Family support</b>  | <b>2.70</b> | <b>4.094</b> | Moderate |
| i48      | 3.1 Acceptance from family about changing physical condition                       | 2.98        | .860         | Moderate |
| i42      | 3.2 Assistance from family in doing housework                                      | 2.92        | .797         | Moderate |
| i41      | 3.3 Care from family in preparing food   | 2.89        | .800         | Moderate |

**Table 36** Mean, standard deviation and SCNs level (n 352) (Cont.)

|   | SCNs   | Mean        | SD           | level    |
|---|--|-------------|--------------|----------|
| i50   | 3.4 Support from family in taking to make merit  | 3.07        | .797         | High     |
| i46   | 3.5 Encouragement from family  | 2.43        | .970         | Moderate |
| i39   | 3.6 Assistance for insomnia  | 2.59        | .911         | Moderate |
| i40   | 3.7 House visit by volunteers and nearby nurses to promote care by family                  | 2.06        | .954         | Moderate |
| <b>4 Awareness of disease and treatment</b> |  | <b>3.42</b> | <b>3.173</b> | High     |
| i26   | 4.1 Explanation about treatment method and progress of the disease                         | 3.49        | .570         | High     |
| i24   | 4.2 Explanation about treatment approach and duration                                      | 3.53        | .584         | High     |
| i1  | 4.3 Expertise of nurse in injecting vein to give chemotherapy                              | 3.49        | .627         | High     |
| i9  | 4.4 Explanation by doctor/nurse with polite words  | 3.26        | .786         | High     |
| i16   | 4.5 Getting examination and chemotherapy within the same day                               | 3.35        | .736         | High     |
| i29   | 4.6 Explanation about side effects of chemotherapy   | 3.39        | .641         | High     |
| i23   | 4.7 Explanation about types and severity of breast cancer                                  | 3.45        | .620         | High     |
| <b>5 Family involvement activities</b>      |  | <b>3.01</b> | <b>2.979</b> | High     |
| i13   | 5.1 Family reminds about appointment date for examination and chemotherapy                 | 2.90        | .827         | Moderate |
| i12   | 5.2 Family involves in getting information and making decision about illness and treatment | 3.13        | .756         | High     |
| i14   | 5.3 Family takes to and from hospitals and accompanies while getting chemotherapy          | 3.10        | .765         | High     |
| i11   | 5.4 Family accompanies into examination room to see doctor                                 | 2.91        | .839         | Moderate |
| i21   | 5.5 Doctor/nurse acts as mediator for family   | 3.05        | .728         | High     |
| <b>6 Consult with professional</b>          |  | <b>2.99</b> | <b>2.255</b> | Moderate |
| i55   | 6.1 24-hour phone consulting service   | 2.84        | .895         | Moderate |
| i22   | 6.2 Information and inquiry service while waiting to see the doctor                        | 3.04        | .717         | High     |
| i19   | 6.3 Allocating time for doctor/nurse to explain and give suggestions                       | 3.26        | .604         | High     |
| i20   | 6.4 Personal individual consulting service   | 2.82        | .846         | Moderate |

**Table 36** Mean, standard deviation and SCNs level (n 352) (Cont.)

|          | SCNs   | Mean        | SD            | level    |
|----------|--|-------------|---------------|----------|
| <b>7</b> | <b>Information on complementary care</b>                                 | <b>2.81</b> | <b>2.647</b>  | Moderate |
| i28      | 7.1 Information about use of herbs while undergoing chemotherapy         | 2.56        | 1.155         | Moderate |
| i27      | 7.2 Information about alternative treatment methods besides chemotherapy | 2.75        | 1.138         | Moderate |
| i36      | 7.3 Information about supplementary food, vitamins and food replacement  | 3.14        | .775          | High     |
| <b>8</b> | <b>Symptomatic relieving and care concern</b>                            | <b>2.75</b> | <b>3.350</b>  | Moderate |
| i3       | 8.1 Alleviation of undesirable symptoms while undergoing chemotherapy    | 2.59        | .859          | Moderate |
| i4       | 8.2 Assistance to toilet while undergoing chemotherapy                   | 2.42        | .924          | Moderate |
| i7       | 8.3 Burning sensation at injection area of chemotherapy                  | 2.88        | .837          | Moderate |
| i8       | 8.4 Alleviation of throat irritation from odor of chemotherapy           | 2.54        | .873          | Moderate |
| i38      | 8.5 Alleviation of nausea from chemotherapy                              | 2.99        | .864          | Moderate |
| i6       | 8.6 Periodical check-up by nurses while undergoing chemotherapy          | 3.08        | .705          | High     |
|          | <b>Total (43 items)</b>  | <b>2.97</b> | <b>18.839</b> | Moderate |

### *The finalized instrument of SCNS-TBC*

The final version of SCNS-TBC consisted of 43 items divided into eight components; 1) financial support (6 items), 2) self-care advice (5 items), 3) family support (7 items), 4) awareness of disease and treatment (7 items), 5) family involvement activities (5 items), 6) consult with professional (4 items), 7) information on complementary care (3 items), and 8) symptomatic relieving and care concern (6 items). This questionnaire was written all in Thai language with directions for respondents. The questionnaire was divided into two parts - assessment of supportive care needs and general information (appendix H).

Part 1 which assessed SCNs divided all 43 items into eight aspects. The researchers arranged items by aspects from number 1 – 43 and the respondents

answered by circling around number 1 – 4 that corresponded with the lowest-low-high-the highest level of significance and necessity according to their perceptions.

Part 2 which asked general information of respondents was divided into personal information and information about breast cancer and chemotherapy treatment. The latter part was information that the researchers could obtain from OPD card which contained history of illness and treatment by doctors. This covered information about stages of breast cancer and chemotherapy formula that the patients received.

Regarding management of data gained from the SCNS-TBC, the researchers checked completeness of data from the two parts before analysis, particularly data from Part 1 which mainly assessed SCNs of Thai women with breast cancer undergoing chemotherapy. Information by aspect and by version, including possible minimum and maximum in each aspect when comparing to number of item in each question, were considered. After that, data were processed from means and standard deviations, both by aspect and overall. Then the scores were translated into a total score of 100 (I. McDowell, 2006) by subtracting possible minimum score in each aspect with mean value, multiplying with 100 and dividing with range of score in that aspect. The derived values were between 0-100 and could be easily compared with score by aspect to see different level of significance and necessity. However, after adjustment of total score by aspect and by version to 100 marks for better comparison of SCNs score, the scores were translated into a range of three levels in order to divide SCNs score into low-moderate-high levels: low (0 – 33.00), moderate (33.01 – 66.00), and high (66.01 – 100).

Results of score translation indicated that overall SCNs of Thai women with breast cancer undergoing chemotherapy was at 65.99 percent (Moderate level). It was found that component 4: Awareness of disease and treatment (7 items) was considered the most significance and necessary aspect of SCNs (80.76 percent – High level) whereas component 3: Family support (7 items) was considered the least significance and necessary SCNs (56.90 percent – Moderate level), as shown in Table 37.

**Table 37** Translation of score by component of the SCNS-TBC

| Component<br>(Number. of item)                               | Cronbach's<br>Alpha | Range of<br>possible<br>score | Mean   | Range<br>of<br>score | Score<br>translation<br>(level) |
|--|---------------------|-------------------------------|--------|----------------------|---------------------------------|
| 1. Financial support<br>(6 items)                            | .769                | 6 - 24                        | 16.75  | 18                   | 59.72<br>(Moderate)             |
| 2. Self-care advice<br>(5 items)                             | .789                | 5 - 20                        | 16.46  | 15                   | 76.40<br>(Hight)                |
| 3. Family support<br>(7 items)                               | .795                | 7 - 28                        | 18.95  | 21                   | 56.90<br>(Moderate)             |
| 4. Awareness of<br>disease and<br>treatment (7 items)        | .817                | 7 - 28                        | 23.96  | 21                   | 80.76<br>(Hight)                |
| 5. Family involvement<br>Activities (5 items)                | .817                | 5 - 20                        | 15.09  | 15                   | 67.27<br>(Hight)                |
| 6. Consult with<br>Professional<br>(4items)                  | .705                | 4 - 16                        | 11.97  | 12                   | 66.42<br>(Hight)                |
| 7. Information on<br>complementary care<br>(3 items)         | .808                | 3 - 12                        | 8.45   | 9                    | 60.56<br>(Moderate)             |
| 8. Symptomatic<br>relieving<br>and care concern<br>(6 items) | .741                | 6 - 24                        | 16.50  | 18                   | 58.33<br>(Moderate)             |
| Total 43 items   | .941                | 43 - 172                      | 128.13 | 129                  | 65.99<br>(Moderate)             |

Nevertheless, research results from this study is a beginning of new instrument development, which may not be completely perfect. The researchers present discussion and further development in Chapter V.





## CHAPTER V

### DISCUSSION

This study developed an instrument for Supportive Care needs Scale for Thai women with breast cancer undergoing chemotherapy (SCNS-TBC). In this chapter, the researchers present discussion according to the objective of this study, that is, to develop an instrument and test for psychometric properties of the proposed assessment tool for supportive care needs (SCNs) of Thai women with breast cancer undergoing chemotherapy. Content of this chapter is divided into conclusion, discussion, limitations of the study, recommendations for use of research results, and suggestions for further study.

#### **Conclusion**

SCNS-TBC is an instrument constructed to assess SCNs of Thai women with breast cancer undergoing chemotherapy. The assessment concerns with level of importance and necessity of problems and solutions of problems that need supports through 43 items in eight components: 1) financial support (6 items), 2) self-care advice (5 items), 3) family support (7 items), 4) awareness of disease and treatment (7 items), 5) family involvement activities (5 items), 6) consult with professional (4 items), 7) information on complementary care (3 items), and 8) symptomatic relieving and care concern (6 items). Format of measurement uses a four-point rating scale signifying by numbers 1-4: 1- the lowest level of significance and necessity to gain assistance; 2- low level of significance and necessity to gain assistance; 3- high level

of significance and necessity to gain assistance; and 4- the highest level of significance and necessity to gain assistance.

This study used instrumental development method dividing into two sections. The first section including six steps (step 1 – step 6) was the development of instrument from interviewing 10 Thai women diagnosed with breast cancer and were undergoing chemotherapy. Data from the interview were analyzed by content analysis to gain the operational definition and significant attributes of SCNs. Both were used to write 62 question items and the draft scale was examined by seven experts for content validity. It was found that I-CVI value was between 0.57 – 1.00 while S-CVI value was 0.91. Then the researchers edited questions to be more suitable and more valid for measurement. There were 55 question items left. The scale was checked for face validity to assess understanding from 10 samples. Language of five question items was edited and then used in the pilot study with 30 samples. Results of this study indicated that the Cronbach's alpha of overall SCNS-TBC was .886 with the remaining 55 question items.

The second section was a test of instrument's quality which was divided into two steps (step 7 and step 8). Start from assessed construct validity in categorization of all 43 question items in the questionnaire with Exploratory Factor Analysis (EFA) process. The analysis was done with 350 samples from five super tertiary cancer care units randomized from four regions of Thailand. Results of EFA were analyzed with Common factor method which was a Principle Components Analysis (PCA). The core was rotated by the Orthogonal Rotation with Varimax with Kaiser Normalization method. It was found that 12 question items were deleted and the remaining 43

question items were categorized into eight components which could explain variation of data at 69.66 percent.

After that, Confirmatory Factor Analysis (CFA) was conducted to check consistency and confirm results of categorization of components with empirical data collected from 352 samples in eight super tertiary cancer care units. Results of the CFA showed that statistical test after model modification had Chi-Square = 862.74,  $df = 591$ ,  $p\text{-value} = 0.000$ ,  $RMSEA = 0.036$ ,  $SRMR = 0.060$ ,  $CFI = 0.941$ , and  $GFI = 0.902$ . The results showed suitability in the ratio of Chi-square and  $df$ ,  $GFI$ , and  $CFI$ . Moreover,  $SRMR$ ,  $RMSEA$  were also acceptable. These results indicated that the modified factor structure model was congruent with the empirical data.

## **Discussion**

### **1. Operative definition of Supportive Care Needs (SCNs) for Thai women with breast cancer undergoing chemotherapy**

The researchers divide discussion of results concerning operative definition of SCNs for Thai women with breast cancer undergoing chemotherapy into two issues.

1.1 Method for determining operative definition and component of SCNs of Thai women with breast cancer undergoing chemotherapy provides basic information for specifying details of SCNs according to the specified components. This is because needs are individual difference which change all the time (Fitch et al., 2008; Harrison et al., 2009; Smith et al., 2014). This leads to differences in major SCNs in each group of patients with difference illness and treatment, as mentioned earlier in the previous chapter.

In this study, the researchers believe in individuality of needs which have specificity (Simmel, 2007). Thus, this study uses inductive method with qualitative data collection method through in-depth interviewing Thai women with breast cancer undergoing chemotherapy, a target group with direct experience (Klungrit et al., 2019). Collection of data with qualitative method is a way to understand thought process and logic of people in the group (Minichiello, Sullivan, Greenwood, & Axford, 2004). Nevertheless, there are various patterns of search for meaning, including literature review, focus group, interview, Delphi technique, or integration of several techniques, depending on philosophical basis of the researchers and purposes of the research.

1.2 Operational definition and components of SCNs for Thai women with breast cancer undergoing chemotherapy in this study are derived from qualitative method. From content analysis and extraction of definition, SCNs from perceptions of Thai women with breast cancer undergoing chemotherapy refer to critical condition of body and mind changes, as well as issues that creates deficiency and guidelines/methods for solving problems with remedy, assistance and necessary responses from family and health care team while undergoing chemotherapy. This includes the duration from before, while, to after undergoing each cycle of chemotherapy of Thai women with breast cancer. The SCNs cover eight components: 1) financial support, 2) self-care advice, 3) family support, 4) awareness of disease and treatment, 5) family involvement activities, 6) consult with professional, 7) information on complementary care, and 8) symptomatic relieving and care concern. Results of this study enable the researchers to understand the operational definition of SCNs for Thai women with breast cancer undergoing chemotherapy. The significant features of this operational

definition cover two main aspects - SCNs refer to problems/issues and problem-solving methods –specific to this group of population. This adds to the following SCNs definition for general cancer patients from the previous existing study. Regarding SCNs of cancer patients, Fitch et al. (2008) who had founded a Supportive Care Framework (SCF) for use as a framework for SCNs of cancer patients in Canada state that SCNs refers to issues of desire which occur in cancer patients and lead to needs for necessary supportive care from others, in order to help them live with their cancer sickness with good quality of life. These include six aspects of needs: physical, emotional, psychosocial, spiritual, practical, and informational which corresponds with and covers holistic care as viewed by nursing profession (Fitch et al., 2008).

It can be seen that definitions from both studies consistently define SCNs as problems encountered by people which affect deficiency in ways of living. However, definition from this study is different from previous studies in that SCNs of Thai women with breast cancer undergoing chemotherapy do not only refer to problems/issues or critical condition of changes in both body and mind, but also include approach and method of dealing with important and necessary problems that make patients require supportive assistance.

1.3 SCNs components of Thai women with breast cancer undergoing chemotherapy. As mentioned above, SCNs of Thai women with breast cancer undergoing chemotherapy in this study consist of eight following components.

1.3.1 Financial support refers to problems-solving occurred from lack of money which leads to needs for supportive assistance from family members concerning reserve money when necessary, explanation about treatment right coverage for cancer patients (Pittayapan, 2016), and support from hospitals

concerning additional expense besides treatment, such as supplement food, wigs, and career support to compensate for income loss. This component is very important in Thai context (Klungrit et al., 2019), maybe due to the mid-to-low economic level of most Thai population. This is also consistent with cancer patients in many countries that also face financial problems from lengthy illness and treatment (Pisu, Martin, Shewchuk, & Meneses, 2014).

1.3.2 Self-care advice to approach or daily-life practice during illness and treatment. This includes suggestions for food that should be eaten and should be avoided which are very necessary and important for this group of patients. It also covers suggestions for use of the arm on breast cancer side, daily activities that can be done, self-care that help increase blood cells to normal level for continuous reception of chemotherapy, and exchange of suggestions about self-care with other people with similar direct experience. It can be seen that this component is similar to and is a part of information need (Boyes et al., 2009; Fitch et al., 2008). This study has items of specific suggestions for breast cancer patients.

1.3.3 Family support refers to assistance and support of family when the patients faced with problems of critical conditions from illness and treatment that cause changes in both body and mind. Patients cannot perform their role and duty as usual which leads to needs for assistance from family members during recovery at home. This includes dealing with insomnia, preparing food, doing duty and errand for patients, taking patients to make merits, understanding and accepting of changes from family members, and visiting by nearby nurses to enhance care by family. It is found that needs in this component are parts of physical,

emotional, psychosocial, and spiritual need of previous knowledge (Boyes et al., 2009; Fitch et al., 2008).

1.3.4 Awareness of disease and treatment refers to caring approach, suggestions, and important information necessary for getting supportive care from doctors and nurses. This includes encouragement and explanation about severity of disease, progress and curing approach they receive, side effects of chemotherapy, as well as blood drawing process, vein injection for chemotherapy, and appointments for treatment.

1.3.5 Family involvement activities refers to approaches or methods that family can participate in care and assistance. This includes reminding before appointment date, taking patients to and from hospitals, participating in hearing and making decision about treatment. This is because this group of patients receive chemotherapy treatment as OPD cases that have to return several times for chemotherapy according to the course of treatment. So, SCNs for involvement of family's activities is very important for this group of patients.

1.3.6 Consult with professional refers to communication approaches or methods that this group of patients see as important and necessary to receive. This includes 24-hour consultant service, answers of inquiry while waiting to see doctors, allocation of time for explanation, and personal consultation, which are not included in existing supportive care needs scale for cancer patients used at present.

1.3.7 Information on complementary care refers to important and necessary information concerning complementary treatment and care, such as herbs, other complementary cures, and choices of supplement food and vitamins. It is

found that attributes in this component indicate culture and context which are different from other countries. The patients are interested in other approaches that give them chance to be cured from the disease and to alleviate their illness.

1.3.8 Symptomatic relieving and care concern refers to several approaches or cares from doctors, nurses, and family while undergoing chemotherapy at hospitals. This includes relief from nausea and pain from injection, periodical check by nurses, assistance in going to toilet, convenience while lying down to receive chemotherapy, and herbal drink service. This component provides details of time-specific care occur only in assessment of this specific questionnaire which is different from other SCNs scale for cancer patients.

The discussion about eight components of SCNS-TBC indicates specificity of this questionnaire which is more specific details in certain issues that are important and necessary for Thai women with breast cancer undergoing chemotherapy. The SCNs in this questionnaire do not only refer to problems or issues, it also include problem-solving methods that this group needs from doctor, nurse, health care team, and involvement from family as well.

## **2. Instrument Construction**

2.1 Construction of quality instrument: Use of four-level numerical rating scale

The response format of this questionnaire is a four numerical rating scale - a rating scale on degree or extend (Wetzel and Greiff, 2018) substituted by numbers which is as popular as Likert scale and is suitable for the newly-constructed SCNS-TBC. This is because this questionnaire assess feeling, opinions, beliefs, and attitudes which the respondents have to determine their own perceptions of



importance and necessity of SCNs in four levels of measurement (even numbers) ranging from the lowest, low, high, to the highest without a moderate level. The reason is with consideration of uncertain decision (Wetzel and Greiff, 2018), measurement range in odd number, including average level, is avoided because some respondents who may not be able to decide between low and high sides will likely be hesitate and choose average level of need which may affect assessment in overall level. However, translation of SCNs results from this questionnaire is based on a range of score divided equally into three levels: low (1.00 – 2.00), moderate (2.01 – 3.00), and high (3.01 - 4.00), as mentioned in Chapter III. So, differences in average score could be noticed in all dimensions - by item, by aspect, and by version.

Furthermore, the rating scale used in this proposed questionnaire is different from rating scale used in other SCNs scale which are developed and used widely at present. Many instruments use five-point Likert scale dividing into unwanted-satisfied-low-average-high (Richardson et al., 2007a; Richardson et al., 2005; Shim et al., 2011). This is because these questionnaires were used with all types of cancer patients. Therefore, some questions may not relevant for some respondents which may lead to different total score of assessment and, thus, very difficult for comparison. So, the use of a four-level numerical rating scale in this questionnaire is more appropriate

## 2.2 Construction of quality instrument: Content validity

This study aims to develop quality instrument to assess SCNs of Thai women with breast cancer undergoing chemotherapy. Face validity of the proposed instrument is examined from a group of 10 samples for understanding in the use of the questionnaire. Moreover, it also passes consideration of seven experts with S-CVI of

0.91. This indicates that overall content validity of the proposed questionnaire is in standard level because all question items are constructed from direct information of Thai women with breast cancer undergoing chemotherapy. Hence, every question has content validity while I-CVI is between 0.57 – 1.00. This indicates that questions with I-CVI less than 0.8 are questions that do not pass consideration criteria and should be deleted or edited to be more appropriate (Polit et al., 2007).

In addition, the questionnaire is also tried out with a group of 30 samples to evaluate reliability. It is found that overall reliability of the questionnaire is 0.886, passes acceptable standard at 0.70 (DeVellis, 2012; Nunnally, 1994). This indicates that the newly-constructed questionnaire has sufficient reliability for the actual study. Moreover, Item-total correlation of each question is also considered with a criteria of value over 0.3 (DeVellis, 2012). Even though, it is found that 11 questions have values under 0.20 (-0.16 – 0.193). This indicates that these questions have low relationship with overall question items which may affect categorization in the main study and reduce reliability. Nevertheless, as these questions contain content from real data provided by people with direct experience, which is important and necessary for the assessment of SCNs in this population group, and overall reliability is still in standard criteria, it could be said that all 55 question items are suitable representatives of the whole questionnaire. Thus, these questions are kept for further reconsideration in the main study.

After the main study, reliability of the SCNS-TBC (final version) which consists of 43 question items in eight components is found to pass standard criteria both by aspect and by overall value (over 0.70) (DeVellis, 2012; Nunnally, 1994). Reliability by aspect is between 0.705 – 0.817 while overall reliability is 0.941.

It could be said that the SCNS-TBC (final version) passes the standard criteria with acceptable level of reliability for use in further study.

### 2.3 Construction of quality instrument: Construct validity

Construct validity is a property of questionnaire which could be measured to be consistent with theory or concept of assessment (DeVellis, 2012). A test for construct validity of the SCNS-TBC is conducted by Exploratory Factor Analysis (EFA) with a group of 350 samples by and Confirmatory Factor Analysis (CFA) with a group of 352 samples. This corresponds with existing studies that determined various patterns of suitable sample size, from a ratio of question item per sample at 1: 5-10 (Auerswald and Moshagen, 2019), or sample size for a questionnaire with large number of question to be 300 persons is good and 500 persons is very good (Williams et al., 2010). Therefore, sample size in this study is suitable in good level and could confirm accurate and referable results of the study. This study checks construct validity with both EFA and CFA.

#### 2.3.1 Exploratory Factor Analysis (EFA)

The researchers analyze with a Common factor method which is a Principle Components Analysis (PCA) popularly used with normal distribution. The core is rotated with Orthogonal Rotation with Varimax with Kaiser Normalization method (Jason W Osborne, Costello, & Kellow, 2008; Williams et al., 2010) which rotates the core perpendicularly to assist in categorizing into separable and suitable component. There are three criteria in consideration for maintaining question item: 1) factor loading of over 0.3 of questions in each aspect which indicates that the question is a true constituent of that component; 2) number of question item in each component should be at least 3; and 3) questions in each aspect

convey the same meaning (Auerswald and Moshagen, 2019; Ferketich, 1991; Williams et al., 2010). After the analysis, there are eight components for a total of 43 question items that could explain data variation at 69.66 percent.

The EFA analysis provides eight components: 1) financial support (6 items), 2) self-care advice (5 items), 3) family support (7 items), 4) awareness of disease and treatment (7 items), 5) family involvement activities (5 items), 6) consult with professional (4 items), 7) information on complementary care (3 items), and 8) symptomatic relieving and care concern (6 items). Each component consists of three to seven question items whose meaning could be grouped into the same component according to the three inclusive criteria (Auerswald and Moshagen, 2019; Ferketich, 1991; Williams et al., 2010).

Categorization of the SCNs in this study, when considered characteristics of each component, is found to be different from categorization of the current and widely-used SCNs scale which divides into six components: 1) physical need, 2) emotional need, 3) psychosocial need, 4) spiritual need, 5) practical need, and 6) informational need (Boyes et al., 2009; Fitch et al., 2008). It could be seen that the names of each aspect signify different perspectives in viewpoint. However, considering by item, it is found that meaning of question items shows problems and solutions of problems that cover the similar holistic care. Components of the existing SCNs scale of cancer patients cover the dimensions of body, mind, emotion, spirit, practice, and information need. On the viewpoint of patients, components of the proposed SCNS-TBC encompasses the dimensions of critical problems and solutions in different period of time, as shown in the eight components of 1) financial support, 2) self-care advice, 3) family support, 4) awareness of disease and treatment, 5)

family involvement activities, 6) consult with professional, 7) information on complementary care, and 8) symptomatic relieving and care concern. However, question items in each component are also related to physical, mind, emotional, social and spiritual conditions.

### 2.3.2 Confirmatory Factor Analysis (CFA)

After CFA analysis, there are eight components of SCNs for Thai women with breast cancer undergoing chemotherapy. There is close consistency with empirical data after modified model, considering from Chi-Square = 862.74,  $df = 591$ ,  $p\text{-value} = 0.000$ , CFI = 0.941, and GFI=0.902, as well as RMSE = 0.036 and SRMR = 0.060 per standard criteria (Hooper et al., 2008). This indicates that the modified factor structure model was congruent with the empirical data.

### Implications

The following are implications of results of this study.

1. From determination of operational definition and important attributes of SCNs of Thai women with breast cancer undergoing chemotherapy, the researchers gain insight which enables access to real SCNs of this population group. From the patients' viewpoint, SCNs do not focus only on problems or issues occurred from impacts of the disease and treatment, but also on solution methods that the patients presented and needed responses, supports or assistances from doctor, nurses and families they regarded as important persons who could help them to pass this critical period. Moreover, their real focuses are not only on SCNs and assistance concerning illness with breast cancer and chemotherapy treatment, but also problems with ways of living and economic condition affected by illness and treatment. Therefore, these

insights are important information to assist in devising care plan to meet holistic needs of patients, which is very important for patient-centered care.

2. The use of SCNS-TBC to assess level of importance and necessity of SCNs of this group of population (Klungrit et al., 2019) which is the first step of nursing process. The nurses will be able to understand problems and expectations for assistance and care from doctors, nurses, and family members, both while receiving chemotherapy at hospitals and during recovery at home.

3. Results from assessment of SCNs of this group of population could be an input for devising care plan and finding significant nursing approach, particularly instruction and provision of guidelines for proper behavior and necessary and useful information (Klungrit et al., 2019). Additionally, being coordinator or mediator between family and patients to create understanding, acceptance and cooperation of family in continuous care of patients while recovery at home is an independent role that nurses could perform immediately in care for patients (Kimiafar, Sarbaz, Shahid Sales, Esmaeili, & Javame Ghazvini, 2016; Kowalski, Lee, Ansmann, Wesselmann, & Pfaff, 2014).

4. Solutions of problems concerning financial difficulty or economic condition are necessarily high priority that patients with chronic illness face and need supportive assistance. The important nursing role in this matter is not to help patients to gain more income, but to receive their treatment right rightfully. Nurses should help coordinate and provide useful information for their rights (Klungrit et al., 2019; Pittayapan, 2016).

5. Results of this study are empirical data concerning some SCNs that are beyond duty of nurses and health care team. Therefore, administrators could use this

information to set up strategies or policies of hospitals at all levels, the Ministry of Public Health, or the country to provide supportive care for Thai women with breast cancer undergoing chemotherapy, as well as for groups of patients with similar illness and treatment.

### **Limitation of the study**

This SCNS-TBC is developed for the first time with an aim to assess SCNs of this specific group of Thai women with breast cancer undergoing chemotherapy. The instrumental development process in this study was conducted in eight steps as mentioned earlier. Results of the study show that the SCNS-TBC still has certain limitations that require attention and further development to gain maximal efficiency for real use. The main limitation found in this study is division of level used in the SCNS-TBC which the researchers chose a four-numerical rating scale in order to reduce discrepancy of uncertainty occurred from answering in moderate level of respondents (Svensson, 2001). This could affect assessment that are clearly divided into two sides – needs in low level and in high level only – with no needs in moderate level. Thus, consideration for the further development of SCNS-TBC should include this matter.

Nevertheless, to solve this limitation in this study, the researchers translated four levels of SCNs scores into three ranges of score – low (1.00 – 2.00), moderate (2.01 – 3.00), and high (3.01 – 4.00) – in order to translate SCNs score from this study into low-moderate-high levels of needs. Even though the proposed SCNS-TBC has limitations in this matter, it is a starting point of the development of instrument to assess SCNs of Thai women with breast cancer undergoing chemotherapy. The use to

confirm quality of this instrument in various areas is necessary to further develop the instrument to be more reliable and for maximal benefit of Thai women with breast cancer undergoing chemotherapy who are waiting for assistance and supportive care that truly corresponds with their needs.

### **Recommendations for Future Research**

1. This study is a development of a newly-constructed SCNS-TBC with a systematic process of instrumental development. It is a starting point for the development of new instrument which may cause some incompleteness as presented above. Therefore, in a further study to extend the development of this scale to increase its quality and its use, there should be more modification of the scale to make the questions more suitable and to cover all aspects of component. Alternatively, this questionnaire may be a basis of further development for other group of similar population, for instance, patients with breast cancer who undergo chemotherapy together with radiation treatment, patients with breast cancer in palliative stage, patients with cervical cancer, and other cancer patients.

2. This SCNS-TBC instrument is newly-constructed for the first time. So, in order to increase reliability of the questionnaire, a comparison study with standard instrument. From literature review, there was no existing instrument to specifically assess SCNs of breast cancer patients undergoing chemotherapy. But there was a standard scale to assess SCNs for cancer patients that was accepted and widely used in many Asian and Western countries. Therefore, a study to compare the use of SCNS-TBC and standard SCNS scale is another recommended study, in order to



confirm quality of this SCNS-TBC questionnaire. Furthermore, there should be a test with Know group validity convergent method to confirm quality and reliability of the proposed questionnaire, in order to determine actual suitability with a population group of Thai women with breast cancer undergoing chemotherapy, when compared to the use of this questionnaire with other groups of population.

3. Results of SCNS-TBC development in this study confirm that SCNS-TBC is a scale that could be used for surveying SCNs of this specific population group in each area, in order to determine effect of contextual difference on level of needs and different aspects of needs, which could be studied in the country, region or province level.

4. A study to find factors that influence level of needs for supportive care is another interesting extension, in order to gain understanding about significant variables that influence differences in level of needs.

5. Design of program or approach to respond to SCNs of Thai women with breast cancer undergoing chemotherapy is another significant study which will play a significant role for oncology nurse. Moreover, it will help improve quality of patient-centered service and supportive care plan, as well as maximize benefits for patients.

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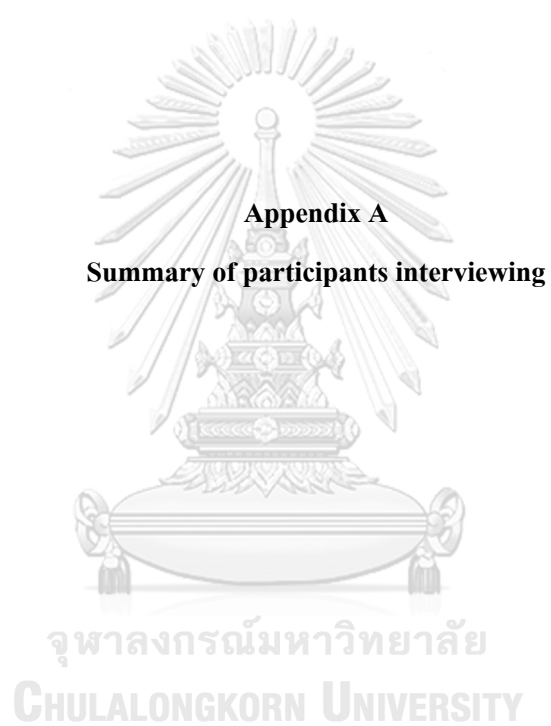
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**APPENDICES**



จุฬาลงกรณ์มหาวิทยาลัย  
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**Appendix A**

**Summary of participants interviewing**



## Summary of participants interviewing

The results of the interview after content analysis indicated that supportive care needs (SCNs) in the phenomena of Thai women with breast cancer undergoing chemotherapy occurred many periods of disease and treatment; some needs in early post-chemotherapy recovery at home, some needs each cycle of chemotherapy at hospital. Moreover, there are various needs of this group such as; useful information and advices, individual counseling, financial problem-solving, family support etc. as follows:

### *1. Early post-chemotherapy recovery at home*

Most participants expressed the sufferings from side effects of chemotherapy occurred mostly during recovery at home, particularly the first one to two weeks after each cycle of chemotherapy. Their sufferings caused major problems that affected changes of body, mind and daily living. There were also some restrictions that they could not respond by themselves and, thus, had to ask for help from members of family or health care team in order to get through the critical period and continue their living normally.

1.1 Most participants said they had problems with nausea in the first week of recovery at home after chemotherapy. They needed help from family members in preparing meals that they could eat easily during the period that they were seriously attacked with nausea and could not each normal meal.

*“After chemotherapy, I was badly allergic. I couldn’t eat anything. My weight went down from 75 to 60 Kg., nearly 15 Kg. loss. Everything smelled bad and I felt nauseated all the time.*

*The anti-histamine medicine given by the doctor barely helped. It was very tortured. Each one had different allergy. Some had more, some had less. I couldn't eat anything on the first two to three days, even my own saliva. After that it got better. I could eat two to three spoons of rice, but mostly I would like something sour. Fruits like oranges, mangoes, tamarinds could help. Watery and sour dish like Tom-yum was also good...I wanted my children to understand me, wanted them to find these things for me, preparing food or something that I could eat because I was not strong enough to do it myself..." (Woman 5)*

*"After returning from the hospital, I often felt bad for a week. I felt weak, nauseated all day, and did not want to eat anything. It was good I could drink. Sometimes I could eat rice with mango. Sometimes I ate banana or papaya. Something that was easy to swallow. Fried and fatty food made me want to vomit...If I did not have my children to buy or prepare food for me, it would be terrible. They were good in asking what I could eat and bought that for me" (Woman 1)*

1.2 Some participants could not sleep because of worry with illness and effect of chemotherapy. These anxiety and worry affected their pattern of daily living until treatment by doctor was necessary, mostly with prescription of tranquilizers during that period.

*“I couldn’t sleep. I was worried and thought of many things. Will I get better? How long will I be in this stage? Some nights I lied with my eyes closed but I did not sleep. I was conscious all the time. So, I was very exhausted in the morning. I used to tell my doctor and he/she gave me tranquilizers. The medicine helped me to get some sleep but it was better than not sleep at all. Sometimes I lied and prayed “Phut-tho” until I slept. Some people are not like this. However, it is very terrible for someone who is like this. If the doctor does not help or give us medicine, it will be very bad” (Woman 5)*

1.3 One participant expressed her needs for help in having sex with her spouse while most participants did not pay attention to this issue. They saw this as unnecessary and unwanted. They believed that their husbands understood and were ready to accept the changes.

*“Actually, I did not want to have sex with my husband, but he seldom came home. I could not disappoint him. We did not have sex as often as before I was ill. If you ask if I am worried, I am. I’m afraid that he will be worried. I want him to understand that I have restrictions. I’m not the same as before. I’m also afraid that he will leave me for other woman ...” (Woman 2)*

1.4 Some participants stated that they needed assistance from family members – children and husband – in doing their duty during the time when they could not do their usual role, such as housework or other errands.

*“Something that I used to do but in the first one or two weeks after chemotherapy, I was so exhausted and weak...I couldn't do anything, washing clothes, cleaning house, cooking. I just wanted to lie down and rest. Before this, I did all the housework myself. But after I was ill until I got chemotherapy, I had to have my husband or my children do them. I had to depend on them. I really did not want to bother them. They all had to work. When I felt better, I did it all myself.” (Woman 5)*

*“My life changed a lot, from the one who could do field work or hard work. After chemotherapy, the doctor forbade me to go out. If I had to go somewhere crowded, I had to wear mask. So, I did not want to go anywhere. I did not want to be exposed to sunlight or smoke. I had to ask my children for help. If necessary, I asked my children or my husband to do it for me” (Woman 3)*

1.5 Some participants felt disheartened with changes occurred from side effect of chemotherapy during recovery at home. Most participants felt dispirited with physical changes like fallen hair, darkened skin, gaunt body, and breast loss. The

most important thing that the participants needed was understanding and acceptance from family in their change and their becoming added burden for the family.

*“Two or three days after the first chemotherapy, I noticed fallen hair . I knew that the hair would fall out. The nurse told me. But when it did fall, I was still depressed...The first time, it was OK, but after the second chemotherapy, all of my hair fell. I decided to shave my head. Firstly, I was not used to it. I did not go out at all. My mouth darkened, my nails blackened like this...I watched myself in the mirror and it was ugly. I did not want anyone to see me. I did not know if my children could accept me. I was like an alien...I wanted them to understand and accept me as I became. Who would want to be like this, right?” (Woman 1)*

1.6 Some participants felt that their body and mind changed from before. They felt disheartened, despair, worried, anxious, and edgy until it led to communication problems in their family. Sometimes, participants could not control their feelings and they felt more worried and anxious. They needed understanding and acceptance from family members about their changing body and mind. Understanding and attention from the family, such as going to make merit, would help patients to feel less worried and more encouraged. Moreover, they also wanted family members who lived far away to call and encourage them as often as possible.

“My family members always asked how I was, if I was hungry, what I would like to eat or want. I was so anxious and edgy that sometimes I yelled at them. I felt sorry for that. If I did not have them, it would be worse. I wanted them to understand that I did not intend to do that. With my body condition, my mind was bad, dispirited, anxious, and worried. I couldn’t help it. I just wanted them to understand and accept that I changed. I wanted them to talk sweetly to me like always. I just got too touchy. All cancer patients want encouragement from family. We don’t know how long we would live...” (Woman 7)

“I think part of what I became is due to my past karma. My bad karma makes me like this, makes me tortured. If I have a chance, I’d like to make merit. Normally, I offer food to monks.... Last week, I asked my daughter to bring me to temple to give the offering to monks. I’d do what makes me feel better because it does not damage anything...” (Woman 2)

“My children who live far away infrequently come to see me. I understand them. They all have family. Sometimes they send me money. They can’t come often. They can’t be absent from work frequently or they’ll be fired....I just want them to call. Sometimes talking to your children helps encourage you a lot.”(Woman 10)

1.7 Some participants expressed the needs for house-visit by nurse or volunteers from nearby hospitals during recovery at home after chemotherapy, particularly within the first week. This is because it is a period when the patients receive the heist side effect of chemotherapy.

*“When I went back home after each chemotherapy, the first week was the most tortured. I couldn’t eat or sleep. I felt exhausted and nauseated all the time. I couldn’t do anything. Sometimes when it got worse, I didn’t know what to do to make it better. Sometimes I was so afraid, I felt I wouldn’t survive (death)...I want the nurse or volunteer from nearby hospital to visit me. I used to see them visit some elderly, diabetic patients, hypertension patients, or bedridden patients, but I never see them visit cancer patients who received chemotherapy. Actually, I think it’s necessary...” (Woman 7)*

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## 2. Each cycle of chemotherapy at hospital

Many participants told about their restrictions that made them seek assistance from others when undergoing chemotherapy at hospitals. There are many processes and steps from travelling to and back from hospital, checking process before chemotherapy, and chemotherapy process at patient ward.

2.1 Some participants have restrictions in travelling to and back from hospital for chemotherapy. They needed help from family in bringing them,

reminding them before appointment date, and contacting each checking station before seeing doctor for chemotherapy.

*“Before chemotherapy appointment date, sometimes I forgot because I had to draw blood one day in advance. Then come back tomorrow to hear blood result and undergo chemotherapy. Sometimes my appointment was postponed and I got confused. I also had appointment for medication at public health center. Too many appointments made me confused. Mostly, I didn’t forget because my children reminded me. They would make a big mark on a calendar and when it was near the due date, they would remind me in advance like...Mom, there’s chemotherapy next week...and remind me again near the appointment date...”*

(Woman 5)

*“It was very difficult to come alone to hospital for chemotherapy. I couldn’t ride a motorcycle on my own. My body condition was not strong. The arm on the operated side was not good enough. So, I had to ask my sister to bring me to and back from the hospital. Actually, I wanted her to accompany me, to help me in submitting card, taking me to X-ray room, which is far away from the doctor’s room. Then go to another building for chemotherapy. Long walking made me dizzy. I wanted to have someone accompany me. At least, I’ll feel better if something*



*happens to me....There is not many hospital staff but there are lots of patients. They can't help us all the time.” (Woman 2)*

*“When I see the doctor and he/she tells me may things, I can't remember all. My brain is blurred. I want my cousin to come into the room with me, so they can help me decide when the doctor asks and I can't think. Actually, the doctor allows them to come. But the doctor's room is very small with a long row of waiting patients. The staff often tells us to come in alone. I dare not ask them...I'm afraid they would be angry...” (Woman 7)*

2.2 Some participants expressed their opinions about checking process and chemotherapy treatment at hospital. They reported restrictions and inconvenience from physical check-up process through blood test, as well as chemotherapy treatment that requires them to travel to and back from hospital for many days, especially those who live far away from hospitals. This group of participants wants to have a one-stop service which helps save time and accelerate check-up and chemotherapy treatment process.

*“It took days for each chemotherapy process. Those who live near the hospital may not feel any effect. But those who live far away have to get up since 4 or 5 a.m. because we are very far...If we come late, we may not get chemotherapy in the afternoon session. We may have to find some place to stay*

*overnight and return tomorrow. And this will affect something else. We don't have much money. Each travel cost us money. It'll be worse if we don't have work. I'm lucky I can get blood test at hospital near my home. If I have to check-up at this hospital, it'll be worse because I have to come many times. If possible, I'd like the hospital to provide One-stop service where everything starts and ends at the same location and we don't have to walk to many places. It takes us time because there are lots of patients. Or, they can get everything done within the one appointment so we don't have to travel many days" (Woman 1)*

2.3 Many participants want nurses who are experts in injecting veins for chemotherapy. Since there is less area for injection than other general patients, fragility of veins make it more difficult to inject. There are also bad side effects from chemotherapy if the veins leak. Thus, injecting veins for chemotherapy is another major problem that the participants are concerned and need nurses who are experts, if they can choose.

*"One thing I felt most discouraged in chemotherapy is vein injection for blood drawing or for chemotherapy because only one of our arms can be used. (The operated arm can't be used.) Thus, this arm was injected repeatedly until it is badly bruised. It is very sore during chemotherapy. If I can choose, I want expert nurse to*

*inject me. Anyway, every nurse here is very good. We may get injected twice from time to time. We have to tolerate.”(Woman 6)*

2.4 Some participants expressed the needs for care during chemotherapy treatment at hospital wards. They want to rest silently without any disturbance. They just want nurse to check or ask them from time to time. They also want someone to take them to toilet due to inconvenience of medication, IV line and IV pole. Furthermore, some participants expressed their needs for other supports, such as some equipment to help them lie down comfortably, facial mask to reduce pungent smell of chemotherapy, and warm herbal drink or candies to reduce bitter taste (irritation) while undergoing chemotherapy.

*“When I undergo chemotherapy, I’d like to rest silently. When the chemo enters my veins, I’d feel dizzy. The doctor may give me sedatives to make me sleepy...Beds here are good. Sometimes if there are many patients, they lie us down on those soft chairs (point to the chairs). It is quite comfortable but we have to ask for sheets or pillows to support our back and our arms, so we won’t be too stiff.” (Woman 4)*

*“Lying down here is quite far away from the counter...but they give me this (squeaky rubber doll) to call the nurse if we want something...But sometimes the nurse didn’t hear when we call because the bed is too far away...I just want the nurse*

*to check on me from time to time...They come periodically though...*” (Woman 5)

“*We can really feel when the chemo enters the vein...It will feel sore all the way. I used to ask a nurse and she said it was usual. But if the chemo gets out of the vein, it will be very dangerous. I don't know if what I feel is normal because it is so sore like when we are burned...just like that. Sometimes I pat it with my hand or with a cloth soaked in cold water and it will be a little better...I think the chemo must be very strong...There should be something to relieve the soreness...*” (Woman 7)

“*A while after receiving the chemo, I'll feel bitter. The saliva will get sticky. I can't really explain. It's not nausea but rather stuck in the throat. They give us a mask but the mask doesn't help. I used the mask when I walked outside...I'd rather have candies or warm water or herbal drink to sip. I think it can help.*” (Woman 9)

“*At old age it's hard to help ourselves. These many IV lines makes it difficult to go to toilet while the chemo makes us pee often...I can't go by myself, I have to ask my children to take me...I have to call my children every time I want to pee. But my*

*children sit at the front and just check on me from time to time.”(Woman 4)*

### *3. Useful information and Advices*

The issue of useful information and advices for Thai women with breast cancer undergoing chemotherapy is a need that every participant sees as important and agreed that there must be correct advices to provide understanding of proper behavior which may result in better symptom and treatment.

3.1 Every participant expressed attention in Nutrition Information, especially food that should be eaten and should be avoided. Nearly every participant what the doctor, nurse or nutritionist to give correct advices about food that can enhance their strength, including various vitamins to maintain normal value of their blood test so they can undergo chemotherapy continuously.

*“The nurse did give me a brochure about how to behave on my first chemotherapy. They also told me not to drink coffee, not to eat fermented food, and other things...what we can eat...what we can’t eat..But sometimes I don’t understand because they didn’t give us full details. If possible, I want the nurse to clearly explain what we must eat and what we must not eat and why because eating is really very important. Particularly when we got the chemo and we can’t eat, our body got bad. If we eat incorrectly, it might be worse. If the white blood cell count doesn’t*

*rise, we can't get chemotherapy...we will get postponed..."*

*(Woman 7)*

*"Things like eating and behavior. Sometime the patient remembers only words and assumes that the doctor tells them to eat this. For example, the nurse told them not eat "Pla Ra" and other fermented food but they can eat "Nam Ya". Actually, there is "Pla Ra" in "Nam Ya". If they don't explain clearly that cooked "Pla ra" can be eaten, the patients will get confused and argue with each other. Thus, the doctor and nurse must tell and explain clearly because it is very necessary. Otherwise patients will remember and behave wrongly..." (Woman 9)*

*"Giving knowledge about food and health care is necessary and significant for cancer patient undergoing chemotherapy because, from talking with others fellow patients, many still misunderstands about eating. For example, we bought Ensure from the hospital because the doctor advised us to eat. Six spoons must be used at a time to provide real result. But some patients do not have much money so they may eat two spoons at a time. But they won't get any result. It's just a waste...So, it's necessary that doctors, nurses or nutritionists should explain until the patient really understands..." (Woman 4)*

*“Similarly, many cancer patients believe that we should not eat meat because meat will accelerate distribution of cancer. But the doctor tells me to eat everything to gain strength. If our blood test doesn’t pass, we can’t get the chemo. So, I want the doctor to advise that if we don’t want to eat meat, what can we eat instead...” (Woman 5)*

*“During chemotherapy I can’t eat anything. Many people tell me to eat vitamins but I don’t know which one I should or should not eat. Actually, I want the doctor to tell or advise me if it’s necessary to eat those vitamins. If they are necessary, I’ll try to get them because I want to be cured...” (Woman 10)*

3.2 Nearly all participants stated that they need information about their illness and treatment, especially stages of breast cancer, distribution of cancer, treatment approach, treatment duration, side effect of chemotherapy, and other alternatives of treatment, such as herbal medication. These participants want their doctors to provide time to explain to them about their disease and treatment and also to their family members. Moreover, some Participants want to get personal advice instead of group advice.

*“The doctor told me that I got stage two or stage three cancer, just like that...but I really don’t know how much I got or will I be cured or how long will I have to be treated. The doctor doesn’t have time to explain but I really want to know. At least I’ll*

know what I should decide to do. I see some patients get chemotherapy for many years and they aren't better. Will I be like that? I want the doctor to have more time to explain to make me understand about my own disease and treatment. For example, when we get chemotherapy, the doctor told us that we may be like this or that because the chemo is so strong. But the doctor never tells us what we must do or how we must behave. I just don't understand. When we talk among patients, we don't know what's right or wrong..." (Woman 9)

"Now, many patients turn to traditional local doctors. Some patients boil herbal medicine to drink and report good result and tell others. I don't know if I can have it. I don't know if it will affect the disease or the chemo so I dare not have it. I used to hear it advertised in TV or radio but I dare not ask the doctor. However, many who have tells me that they feel better...If you ask it it's necessary for me I think it is because nowadays herbal treatment is very popular. I want the doctor to explain if patients like me can use it or not. Actually, I decided to treat with the doctor because I believe in him/her" (Woman 3)

"Both doctors and nurses tell and teach us well...but they just don't have time to explain in details...I know that there are so many patients coming in all the time that the nurses rarely



*have time for lunch. I understand...The doctor also tells me all the time to ask...but I myself don't know what to ask. I'm afraid that I'll ask incorrectly or wrongly...When I don't ask, they don't know what to tell me...Really, I want the doctor to tell or teach me and have more time for explanation because when I don't ask, the doctor speak shortly..." (Woman 4)*

*"Sometimes my husband didn't understand why I had to cut my breast out. How serious is my illness. I don't know how to explain to make him understand...I just know that I have to do what the doctor tells me. For prohibitions, my family doesn't understand and doesn't know how they can help me. I want the doctor to tell my family to make them understand that each time I see the doctor...If they want to know anything, they can ask the doctor. But I know that the doctor doesn't have much time...I understand..."*  
 (Woman 2)

*"Sometimes I have a problem that I'm afraid to ask the doctor or nurse...because it's quite too personal to ask anyone...Sometimes I want to talk or discuss personally but I'm afraid...I know that they don't have much time. There are many patients every day." (Woman 2)*

3.3 Some participants had problems with many postponements of chemotherapy because their blood tests do not pass or their body conditions are not ready for chemotherapy. These patients needed information and explanation from doctor or nurses about how to behave to help them deal with the problem, including necessary behavior and other things concerning with their illness and treatment.

*“My chemotherapy was postponed 3 times. The doctor told me that my Platelets and White blood cells did not pass. If I got the chemo, I might die. It was very scary...I don't know what platelets and white blood cells are. What can I do to increase them? So, I can get chemotherapy every time I come. Each time I came, I had to cross my fingers if I could get chemotherapy this time. Would the cancer distribute more if I couldn't and had to be postponed...I just don't know. I want to be cured. The nurses told me to eat a lot so my blood cell would go up. What else should I do? I try to eat as much as I can. I want the doctor or nurse to explain to me what I should do to get my blood test pass so I can get chemotherapy every time without postponement.” (Woman 3)*

*“The doctor told me that the arm on my operated side cannot lift heavy things, touch hot things, draw blood, measure blood pressure, or wear any accessory – ring, watch – or it may be swollen. But when I cook, I have to touch something hot sometimes because I cannot fully use this (left) side. Moreover, if I'm*

*forbidden to do these many things, I'll become a burden for others. So, if I can do anything, I'll do because during my first bad weeks, my children help me everything...Sometimes, I want to ask the doctor what I can do with this arm and how much I can use it..."(Woman 8)*

3.4 Some participants expressed that telephone information service is another thing they needed when they faced some problems that they could not deal with during recovery at home. Telephone service will provide them with choices in consultation to find solutions for these problems. On the other hand, some Participants thought that exchanging with other breast cancer patients with similar direct experience was another needed alternative.

*"When the nurse told me that I would be like this or that and how I should behave, sometimes I didn't understand because I never had it myself. I just heard others. But when I got back home and faced the problems that the nurse told me, sometimes I didn't know what to do. I couldn't ask anyone so I tried by myself. I want to have someone that I could phone to consult 24 hours. So when I want to know something and I can't find solution, I can call to ask the doctor. Maybe it's too late to wait until the next appointment..." (Woman 7)*

*“Someone in similar situation will feel the same...will understand. When we talk, we’ll feel that we do not suffer alone. We’ll get more encouragement. I like to talk to them. Mostly we talk while we’re waiting for the doctor or while we’re lying down for chemotherapy...Sometimes, we find out that we are from the same province...While we talk, we exchange our experiences - what we did to alleviate the problems. Just like we tell stories...What we’re not sure we’ll ask the doctor if it’s right...” (Woman 2)*

#### *4. Financial problem-solving*

Financial problems are very important among Thai population, particularly those who have chronic illness and need to undergo continuous treatment. Breast cancer patients are another affected group of patient. Thus, they face serious problem and need to gain support from government agencies and hospitals, as well as families and cousins.

4.1 Most participants stated that the financial problems they faced in their family do not include only treatment cost, but also other general expenses occurred during their illness and throughout the treatment. The long and continuous chemotherapy treatment process requires participants to travel many times for chemotherapy at hospitals. The illness with breast cancer and its treatment lead to cancellation of work that affects loss of income for some Participants. So, they expect to get assistance from hospitals, agencies and the government in support for excessive expenses like travelling, food or room that are beyond their rights. They also need

support for career that they can do to get income instead of the work that they cannot do while undergoing treatment.

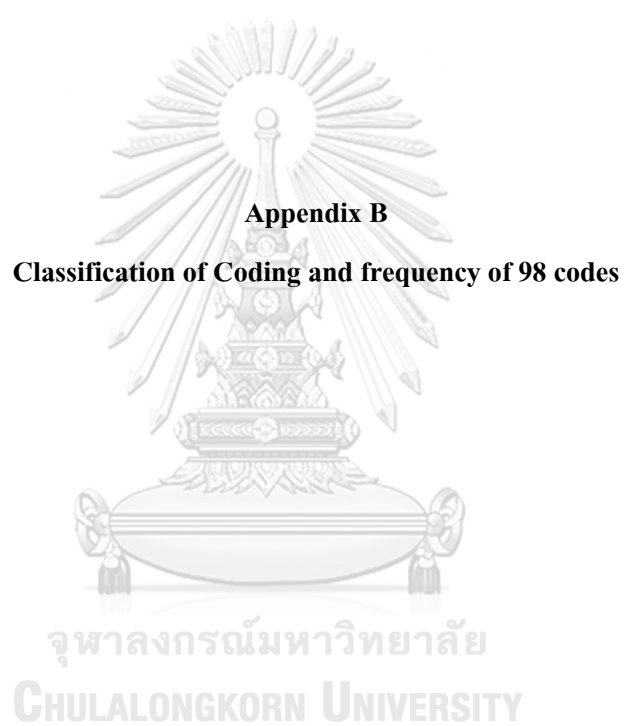
*“Speaking straightforwardly, the most serious problem for cancer patients who have to get chemotherapy for a long time like me is career and expense. These are problems for everyone because we can’t work at all. The money we used to have is all spent. I really need assistance but I don’t know who can help me in this matters. We have to struggle by ourselves. I borrow from my cousin as much as they can help...” (Woman 5)*

*“Actually, I use 30-baht right. I don’t have to pay extra treatment cost. But there are many necessary expenses. There are a lot of expense each time I come for chemotherapy- eating, travelling, etc. If I couldn’t get chemotherapy on the appointment day, I had to find some place to stay overnight because my home is far away. It also wasted time because I had to come back tomorrow. I don’t have much money. I can’t work. There are a lot of problems. What is more serious than my illness is this problem. Who will help us? I want the government to see this matter. There are a lot of poor people. Poor and ill are worse...At least, there should be some work for these people to do to get income because we are very bad these days” (Woman 3)*

4.2 Some participants need assistance and other supports concerning additional expenses that they cannot afford, like wigs hats, turbans, and supplementary food such as powdered protein like Ensure that they cannot afford.

*“When my hair started to fall out bits by bits, it was very ugly. I looked like a ghost in the mirror. I couldn’t accept myself. So, I shaved and I’m not used to it. I’m embarrassed when I get out. I have to wear hat or turban when I get out. But I leave it like this inside the house because it’s more convenient. The hospital used to give free wool hat, turban, or wig. But there are so many patients now that they don’t have enough freebies. So, we have to buy them. I need them when I go out” (Woman 5)*

*“My chemotherapy used to be postponed because my blood test did not pass. The doctor tells me that my body is not strong because I can’t eat. The nurse advises me to buy Ensure milk to eat because it has all the nutrition. If I cannot eat other things, I should try to drink this milk. But it is very expensive. I can’t afford it. I rarely have enough money for food...I want to eat it because I want my blood test to pass every time so I can get chemotherapy. I don’t know if my cancer distributes when my chemotherapy is postponed. The hospital should give the milk to those who have problems...” (Woman 3)*



### Classification of Coding and frequency of 98 codes

| Total of 207 codes  | Frequency | 98 codes  |
|---|-----------|---|
| 1. I need explanation about the cancer I have.  | 10        | 1. Information about breast cancer and one own treatment                      |
| 2. I need the doctor to explain about characteristic and severity of the cancer I have.           |           |   |
| 3. I need information about the treatment I get.  |           |   |
| 4. I need to know how long I have to undergo chemotherapy until I am completely cured.            |           |   |
| 5. I need information about progress of breast cancer I have.                                     |           |   |
| 6. I want to know level and severity of the cancer I have.  |           |   |
| 7. I want to know if I will be completely cured.  |           |   |
| 8. I want the doctor to explain about the disease and treatment approach I will get.              |           |   |
| 9. I want to know which stage of cancer I have and whether it can be treated.                     |           |   |
| 10. I want the doctor to tell about progress of their treatment periodically.                     |           |   |
| 11. I want to know types of food I can eat.   | 7         | 2. Explanation about kinds of food that should be eaten and should be avoided |
| 12. I want to know types of food I should avoid while undergoing chemotherapy.                    |           |   |
| 13. I want to know types of food that will help me to recover well while undergoing chemotherapy. |           |   |
| 14. I want to know types of injurious food that I should not eat.                                 |           |   |
| 15. The doctor should be able to tell what could be eaten and what could not.                     |           |   |



| Total of 207 codes  | Frequency | 98 codes   |
|---|-----------|--|
| 16. I want detailed explanation about types of food that I could eat.                                   |           |  |
| 17. When I could not eat anything, I want to know what I could eat to instead of food.                  |           |  |
| 18. I have serious nausea in the first week after chemotherapy  | 5         | 3. Nausea after chemotherapy                                 |
| 19. I take anti-nausea medicine given by the doctor but I'm still not better. I do not know what to do. |           |  |
| 20. I want more anti-nausea medicine from the doctor.   |           |  |
| 21. I'm so very nauseated that I could not eat or sleep and feel very exhausted.                        |           |  |
| 22. I want to nauseate all the time, especially during the first week after chemotherapy.               |           |  |
| 23. How does chemotherapy affect the body?  | 4         | 4. Information about side effect of chemotherapy             |
| 24. I want explanation about side effects of chemotherapy in different stages.                          |           |  |
| 25. I want to know effect of chemotherapy on the body.  |           |  |
| 26. Are chemotherapy effects on the body the same for everyone?   |           |  |
| 27. I want information about herbs for breast cancer treatment.   | 4         | 5. Information about use of herbs together with chemotherapy |
| 28. Could herbal treatment be used together with chemotherapy?  |           |  |
| 29. What types of herb could be eaten?  |           |  |
| 30. Could I use herbs suggested in medicinal advertisements?  |           |  |
| 31. I want to know about other alternative treatments besides chemotherapy.                             | 3         | 6. Information about other alternative treatments            |
| 32. If I do not want chemotherapy, are there any other choices for treatment?                           |           |  |

| Total of 207 codes  | Frequency | 98 codes  |
|---|-----------|---|
| 33. Could alternative medicine be used together?  |           |   |
| 34. I want to know information about my treatment right.                                  | 3         | 7. Information about treatment expense and use of treatment right                     |
| 35. I want the nurses to explain about steps of using treatment rights without expense.   |           |   |
| 36. I want to know details of all expenses for the treatment                              |           |   |
| 37. I want information about additional expense that are not included in treatment right. | 2         | 8. Information about additional expense beyond treatment right and practice guideline |
| 38. What should be done if there are additional expense beyond treatment right?           |           |   |
| 39. My family is poor. I want all treatment according to my right without expense.        | 2         | 9. Treatment according to their rights with no additional expense                     |
| 40. I want treatment according to the right without additional expense.                   |           |   |
| 41. I feel discouraged about long chemotherapy treatment.                                 | 2         | 10. Information about duration of chemotherapy treatment                              |
| 42. I have no idea how long the chemotherapy will take.                                   |           |   |
| 43. I want to know if the cancer will come back or increase after treatment.              | 2         | 11. Information about recurrence of the disease                                       |
| 44. I'm afraid that I will not be cured or the disease will increase.                     |           |   |
| 45. I want to know chance for survival from the illness                                   | 2         | 12. Information about chance of survival  |
| 46. The doctor should tell directly about chance of cure after treatment.                 |           |   |
| 47. I want information about treatment after completion of chemotherapy.                  | 2         | 13. Treatment approach after completion of chemotherapy                               |
| 48. Is it necessary to get other treatments after completion of chemotherapy?             |           |   |
| 49. I want information about medicine used to cure cancers that are widely advertised.    | 2         | 14. Information about traditional folk medicine used to cure cancer                   |

| Total of 207 codes  | Frequency | 98 codes   |
|---|-----------|--|
| 50. Could they eat traditional folk medicine sold widely?   |           |  |
| 51. Nurses should separately provide suggestions for those who undergo chemotherapy for the first time.                     | 2         | 15. Suggestions for chemotherapy first-timers                        |
| 52. I do not know anything in the first time. Nurses should explain in details.   |           |  |
| 53. I want the nurses to pay special attention to those who undergo chemotherapy for the first time.                        | 2         | 16. Services for chemotherapy first-timers                           |
| 54. There should be separate services for those who undergo chemotherapy for the first time.                                |           |  |
| 55. I want the doctor/nurses to provide instructions without inquiry from patients.   | 2         | 17. Explanation or instructions without inquiry from patients        |
| 56. Sometimes I do not know what to ask. The doctor/nurses should tell or explain right away.                               |           |  |
| 57. I want nutritionists to provide knowledge about food while waiting to see the doctor.                                   | 2         | 18. Instructions and recommendations while waiting to see the doctor |
| 58. I want nurses to answer questions and give suggestions while waiting to see the doctor.                                 |           |  |
| 59. I want the doctor/nurses to explain clearly in details.   | 2         | 19. Explanation with clear and understandable details                |
| 60. Sometimes I do not understand what the doctor says but I dare not ask. I want the doctor to explain clearly in details. |           |  |
| 61. The doctor does not have time. I want him/her to have longer time to explain.   | 2         | 20. Time for doctors to provide explanations or suggestions          |
| 62. If I do not ask, the doctor does not say anything. He/she should have more time for each patient.                       |           |  |
| 63. When I cannot do as the doctor told me, I want him/her to tell me nicely without blaming to make me feel sorry.         | 2         | 21. Conversation politely without blame                              |

| Total of 207 codes  | Frequency | 98 codes   |
|---|-----------|--|
| 64. I want the doctors and nurses to speak nicely without blame or complaint.                         |           |  |
| 65. I want the doctors and nurses to speak nicely for encouragement in treatment.                     | 2         | 22. Encouragement from doctors and nurses                            |
| 66. I want verbal encouragement from doctors/nurses.  |           |  |
| 67. I want the doctor to explain to my family to make them understand about my illness and treatment. | 2         | 23. Mediator between patient and family                              |
| 68. I want the doctor to be a mediator between patient and family.                                    |           |  |
| 69. I want my family to accompany me into examination room.   | 2         | 24. Family accompaniment to see doctor in examination room           |
| 70. I want the nurse to allow my family to accompany me into examination room.                        |           |  |
| 71. I want my family to think and making decision about treatment.                                    | 2         | 25. Family involvement in getting information and making decision    |
| 72. I want my family to be informed and involve in making decision when seeing doctors.               |           |  |
| 73. I want suggestions from those who have similar direct experiences.                                | 2         | 26. Suggestions from those with direct experiences                   |
| 74. Sometimes I want to learn from those who had experience with chemotherapy treatment.              |           |  |
| 75. I want explanation about the importance of blood examination.                                     | 2         | 27. Information about blood examination before chemotherapy          |
| 76. I want to know why platelets and white blood cells are important for chemotherapy.                |           |  |
| 77. I want to know how to do to be completely cured from the existing cancer.                         | 2         | 28. Suggestions about behaviors that promote cure from breast cancer |
| 78. I want to know if one can be cured from this disease and how to behave.                           |           |  |
| 79. I want the nurses to explain about correct behavior during recovery at home.                      | 2         | 29. Suggestions about correct behaviors                              |

| Total of 207 codes  | Frequency | 98 codes  |
|---|-----------|---|
| 80. I want to know how to behave during recovery at home.   |           |   |
| 81. I want blood examination result to be normal every time.  | 2         | 30. Continuity of chemotherapy reception without postponement                   |
| 82. I want to undergo chemotherapy continuously every time without postponement.                              |           |   |
| 83. I want the nurses to suggest self-care method at home.  | 2         | 31. Self-care during recovery at home   |
| 84. I try to look after oneself as good as possible because sometimes I cannot do as suggested by the nurses. |           |   |
| 85. I want suggestions about daily living and daily activities.   | 2         | 32. Information about doing activities in daily life                            |
| 86. I want to know what I can do and cannot do in each day.   |           |   |
| 87. I want explanation about work or activities that I can do.  | 2         | 33. Information about types of activities and chores that could or could not do |
| 88. I cannot do my old work. I want to know what work I can do during my illness.                             |           |   |
| 89. I want to have additional occupation to increase income.  | 2         | 34. Occupation or work that could be done to increase income                    |
| 90. I want to work to increase income.  |           |   |
| 91. I want information about supplementary food and vitamins that could be eaten                              | 2         | 35. Information about supplement food and vitamins                              |
| 92. I want information about supplementary food and other stimulants.   |           |   |
| 93. I want to know importance of supplementary protein (Ensure milk) that I should eat.                       | 2         | 36. Information about supplementary protein                                     |
| 94. How long do I have to take supplementary protein?   |           |   |
| 95. I cannot eat fried or fatty food. I feel nauseated just to think of it.                                   | 2         | 37. Avoid food that induce nausea   |
| 96. I cannot eat fried or stir-fried food.  |           |   |
| 97. I want information about food replacement if I do not eat meat  | 2         | 38. Information about food replacement  |

| Total of 207 codes   | Frequency | 98 codes  |
|--|-----------|---|
| 98. If I do not eat meat, what could I eat instead to suit my illness and treatment                              |           |   |
| 99. When my nausea gets more severe, I want my family to prepare food that I can eat.                            | 2         | 39. Family involve in food preparation                            |
| 100. I want my family to prepare food, especially during loss of appetite.                                       |           |   |
| 101. I want to eat sour fruits to alleviate nausea.  | 2         | 40. Family prepares sour fruits or food to alleviate nausea       |
| 102. I want my family to buy sour fruits or foods.   |           |   |
| 103. I do not want to eat meat. I want my family to prepare vegetarian food.                                     | 2         | 41. Family prepares vegetarian food                               |
| 104. I want to eat vegetarian food but it's hard to find. I want my family to prepare vegetarian food.           |           |   |
| 105. I cannot sleep so sometimes I have to depend on sleeping pills.   | 2         | 42. Insomnia  |
| 106. I cannot sleep and have to chant "Buddho" repeatedly until I fall asleep.                                   |           |   |
| 107. I feel so exhausted in the first weeks. I want my family to do housework for me.                            | 2         | 43. Family does housework during exhaustive stage                 |
| 108. I do not want to do anything when I feel very exhausted. I want family to do it for me.                     |           |   |
| 109. I do not want to go out. Sometimes I want my family to do business for me                                   | 2         | 44. Family does other business while I cannot do by myself        |
| 110. It is very difficult to go out. I have to depend on my family to do business for me.                        |           |   |
| 111. I want my family to take care of me especially in the first week after chemotherapy because it is very bad. | 2         | 45. Special care from family in the first week after chemotherapy |
| 112. I cannot do anything in the first week after chemotherapy except sleep. I want my family to take care of me |           |   |

| Total of 207 codes  | Frequency | 98 codes  |
|---|-----------|---|
| 113. I want to know how to prevent hair fall.   | 2         | 46. Hair fall caused by chemotherapy                                  |
| 114. I want to know about hair fall symptom of each person who receive chemotherapy.        |           |   |
| 115. I want turbans to cover my head when hairs fall until I have to shave.                 | 2         | 47. Turbans or hats to cover hairless head                            |
| 116. I want hats to cover my hairless head.   |           |   |
| 117. I want to know how to behave to reduce infection.                                      | 2         | 48. Suggestions to prevent infection                                  |
| 118. How to prevent easy infection.   |           |   |
| 119. I'm worried that my husband will not understand limitations in sexual relationships.   | 2         | 49. Husbands' understanding about limitations of sexual relationships |
| 120. I'm unable to have sexual relationships as normal. I want my husband to understand.    |           |   |
| 121. I'm very stressful and anxious about illness and treatment.                            | 2         | 50. Stress and anxiety about disease and treatment                    |
| 122. I'm so stressful and I do not want to talk to anybody. Sometimes I cry alone.          |           |   |
| 123. I feel confused. Do not know what to do.   | 2         | 51. Confused and uncertain  |
| 124. I'm confused, uncertain, and do not know what to choose.                               |           |   |
| 125. I cannot accept the situation. I want my family to understand.                         | 2         | 52. Encouragement from family in admitting illness and treatment      |
| 126. I want my family to understand and encourage me during the bad times.                  |           |   |
| 127. I want my family members to speak nicely and provide encouragement for me.             | 2         | 53. Encouragement and good words from family                          |
| 128. I want my family members to encourage with no bad words to cause sorrow or discourage. |           |   |
| 129. I want my remote family members to visit me.   | 2         | 54. Encouragement from remote family members                          |

| Total of 207 codes   | Frequency | 98 codes  |
|--|-----------|---|
| 130. I want my children to stay near especially during illness.  |           |   |
| 131. I do not want to go out. I want to stay home.   | 2         | 55. Do not want to meet anyone outside house and want to rest quietly at home |
| 132. I do not want to talk with anyone. I do not want anyone to question anything. I want to stay quietly at home. |           |   |
| 133. I'm anxious about physical changes like hair fall, blackened lips, and blackened nails.                       | 2         | 56. Anxious about changing appearance   |
| 134. I'm anxious about how long physical changes will last.  |           |   |
| 135. I want my family to accept the occurring changes.   | 2         | 57. Acceptance from family about changes without disdainful gesture           |
| 136. I do not want my family to be disgusted about the changing physical conditions.                               |           |   |
| 137. I feel embarrassed and do not want anyone to see me.  | 2         | 58. Embarrassed and do not want to meet people                                |
| 138. Some people are afraid of my physical condition, so I do not want to see anybody when I receive chemotherapy. |           |   |
| 139. I want my children to call frequently.  | 2         | 59. Phone call from remote family members                                     |
| 140. I want my remote cousins to call and chat.  |           |   |
| 141. I want to make more merit.  | 2         | 60. Family involves in taking to make merit                                   |
| 142. I want my children to take me to temple to make merit.  |           |   |
| 143. I have to borrow money from cousins when necessary.   | 2         | 61. Loan from cousins when lack money   |
| 144. I want to have reserved money when I do not have enough treatment expense.                                    |           |   |
| 145. Sometimes I have to borrow cars from my younger brother to go to hospital to get chemotherapy.                | 2         | 62. Vehicle support to travel to and from hospital to get chemotherapy        |



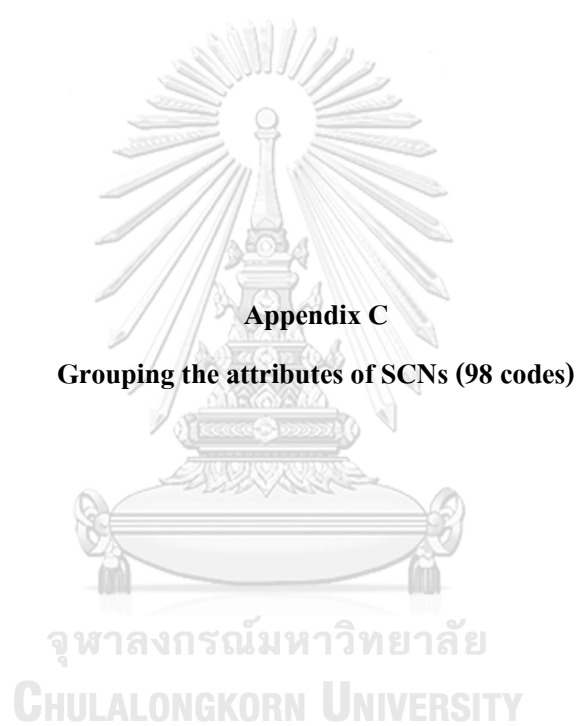
| Total of 207 codes   | Frequency | 98 codes   |
|--|-----------|--|
| 146. I have to ask neighbor to take me on motorcycle to go to hospital to get chemotherapy.  |           |  |
| 147. I have to spend a lot each time I go to hospital. There should be support from the government.                                      | 2         | 63. Government support for additional expenses like travelling fare, accommodation fee, etc. |
| 148. I want financial support for various expense when I go to hospital to get chemotherapy such as travel fare, accommodation fee, etc. |           |  |
| 149. I want to have shuttle bus for patients when I go to hospital to get chemotherapy   | 2         | 64. Vehicle to travel to and from hospital to get chemotherapy                               |
| 150. I want the hospital to have shuttle bus because it is very difficult to go to hospital to get chemotherapy.                         |           |  |
| 151. I want the hospital to provide accommodation for patients from faraway area.  | 2         | 65. Support for accommodation or accommodation fee   |
| 152. I do not have accommodation expense if I have to stay overnight when I cannot get all examination in one day.                       |           |  |
| 153. The hospital should provide food service for patients and cousins.  | 2         | 66. Support food for both patients and cousins when undergoing chemotherapy at hospitals     |
| 154. There are additional expense for food when going to hospital to get chemotherapy. Sometimes I have to take food from home.          |           |  |
| 155. I want my cousins to remember and remind me of appointment date with the doctor.  | 2         | 67. Remind of appointment date to see doctor   |
| 156. Sometimes I have to see many doctors. I cannot remember the appointment. I want my cousins to remind me.                            |           |  |
| 157. I have to have someone taking me to and from hospital every time I get chemotherapy.  | 2         | 68. Cousins to take me to and from hospitals to get chemotherapy                             |

| Total of 207 codes   | Frequency | 98 codes   |
|--|-----------|--|
| 158. I want to have someone taking me to and from hospital every time I get chemotherapy or examination.   |           |  |
| 159. I want someone to help me with submitting OPD card each time I come for examination.  | 2         | 69. Support and assistances in submitting OPD card                                       |
| 160. I have to wait in a long queue for submitting OPD card. Cousins can help with this if they come with me   |           |  |
| 161. It always take days to go to hospital. I want to get examination at a suitable time.  | 2         | 70. Facilitating examination in the right time   |
| 162. Sometimes I have to wait for a long time to complete each step. I want to get all examinations within the same day.   |           |  |
| 163. I want staff to assist in various steps of getting chemotherapy.  | 2         | 71. Facilitation and assistances from staff in various steps of undergoing chemotherapy  |
| 164. I want staff to facilitate in each step of examination.   |           |  |
| 165. Each examination is sometimes in different buildings – X-ray, blood draw – I want someone to take me to each place for convenience.   | 2         | 72. Assistances in taking to examination in various sites                                |
| 166. It always takes days to complete all examination because I have to go to various places. I have to ask someone else on my first time because I do not know the place.                     |           |  |
| 167. It takes many days for each chemotherapy, 1 day for blood draw and 1 day for chemotherapy. Everything should be done within the same day.   | 2         | 73. Examine blood to prepare body readiness and undergo chemotherapy within the same day |
| 168. My house is very far. I have to stay overnight each time I get chemotherapy because it takes time for blood draw and for chemotherapy. Everything should be finished within the same day. |           |  |

| Total of 207 codes  | Frequency | 98 codes   |
|---|-----------|--|
| 169. I get a burning sensation in veins at injection area.  | 2         | 74. Burning sensation at injection area  |
| 170. The chemotherapy is quite intense. I could feel the chemo coming inside the veins. It burns through the veins.                     |           |  |
| 171. Sometimes I feel cold while lying down to get chemotherapy. I want a blanket or a turban.  | 2         | 75. Something to keep body warm such as blanket, turban  |
| 172. Sometimes I have to ask for extra blanket from the nurse because the air-conditioner is very cold.                                 |           |  |
| 173. I want some pillows to support my back or arm because it feels quite stiff when lying down for a long time.                        | 2         | 76. Something to alleviate stiffness while lying down to get chemotherapy such as back-support pillow, arm-support clothes, etc. |
| 174. You have to be careful of the injected arm. I want some pillow or clothe to support it to get rid of stiffness.                    |           |  |
| 175. It is very difficult to go to toilet because I need someone to support me.   | 2         | 77. Assistance to toilet while getting chemotherapy at hospitals   |
| 176. The IV lines are untidy. I need my children to help me to toilet.  |           |  |
| 177. The chemical smell is very intense and burns my nose.  | 2         | 78. Burning nose from odor of chemotherapy   |
| 178. Sometimes I have to wear a mask while lying down to get chemotherapy because the chemical smell is very intense and burns my nose. |           |  |
| 179. When I have to lie down on bed that is far from the nurse's counter, I want the nurse to check on me periodically.                 | 2         | 79. Periodically visit by nurses while lying down to get chemotherapy  |
| 180. The nurses work all day. Just visit from time to time is enough.   |           |  |
| 181. I want to rest quietly while getting chemotherapy.   | 2         | 80. Resting quietly without disturbance from others while getting chemotherapy   |
| 182. I do not want anybody to disturb me while lying down to get chemotherapy. I want to sleep.   |           |  |

| Total of 207 codes  | Frequency | 98 codes  |
|---|-----------|---|
| 183. I do not want to eat anything while lying down to get chemotherapy. My throat is bitter. Candies may help, though. | 2         | 81. Candies to alleviate throat irritation                              |
| 184. I always carry candies. It helps moisten my throat.  |           |   |
| 185. I want to sip warm herbal drink while lying down to get chemotherapy to moisten my throat.                         | 2         | 82. Warm herbal drink to reduce throat irritation                       |
| 186. While lying down to get chemotherapy, the saliva is sticky. Warm herbal drink may help.                            |           |   |
| 187. I want my children to be with me each time I get chemotherapy for encouragement.                                   | 2         | 83. Encouragement while undergoing chemotherapy                         |
| 188. Having someone near while getting chemotherapy gives me more encouragement.  |           |   |
| 189. I want my children to accompany me when I go to hospital to get chemotherapy.                                      | 2         | 84. Accompaniment of cousins while undergoing chemotherapy at hospitals |
| 190. It is difficult to come back when you go for chemotherapy alone. I want my cousins to accompany me.                |           |   |
| 191. When I'm worried and think a lot or cannot settle my mind, sometimes I want spiritual anchor to help me better.    | 2         | 85. Spiritual anchor when feeling worried                               |
| 192. When I'm worried, I close my eyes and chant "Puttho" repeatedly.   |           |   |
| 193. I try to do everything by myself as much as possible.  | 2         | 86. Do not want to be a burden for family                               |
| 194. I do not want to be a burden for my family.  |           |   |
| 195. I want assistance from my family or close friends only.  | 2         | 87. Depend firstly on assistance from family                            |
| 196. I do not want to depend on anyone except my family.  |           |   |
| 197. I want to know how to have sexual relationship during the time of illness and chemotherapy.                        | 1         | 88. Information about sexual relationship                               |

| Total of 207 codes  | Frequency | 98 codes   |
|---|-----------|--|
| 198. I want to know how chemotherapy's side effect affect sexual relationship.                                | 1         | 89. Information about side effect of chemotherapy on sexual relationship |
| 199. I want to know prohibitions for the arm on the operated side.  | 1         | 90. Guidelines for using the arm on the operated side                    |
| 200. Nurses should give practical guidelines to increase platelets in order to get chemotherapy continuously. | 1         | 91. Guidelines for behavior that would increase platelets                |
| 201. Sometimes I have personal issues that require personal individual consultant.                            | 1         | 92. Personal advise  |
| 202. I want to have 24-hour health consult service when I have problems while I'm home.                       | 1         | 93. 24-hour consultation service   |
| 203. I want nurses or volunteers to pay me a visit during my recovery at home.                                | 1         | 94. House-visit by volunteers or nurses from nearby hospitals            |
| 204. I want to have conversation with someone who also has breast cancer and undergoes chemotherapy.          | 1         | 95. Conversation with someone with similar experience                    |
| 205. Sometimes I want to wear wigs to cover my hairless head when I go out.                                   | 1         | 96. Support for wigs   |
| 206. I want to have supplementary food and additional career to increase my income.                           | 1         | 97. Supplementary food and career for additional income                  |
| 207. I am very afraid of being injected or drawn blood many times so I want nurses who are very experienced.  | 1         | 98. Need the nurses who are expert in injecting veins                    |



**Appendix C**

**Grouping the attributes of SCNs (98 codes)**

จุฬาลงกรณ์มหาวิทยาลัย  
**CHULALONGKORN UNIVERSITY**

### Grouping the attributes of SCNs (98 codes)

#### Physical (10 codes)

- 3. Nausea after chemotherapy
- 30. Continuity of chemotherapy reception without postponement
- 42. Insomnia
- 46. Hair fall caused by chemotherapy
- 74. Burning sensation at injection area
- 75. Something to keep body warm such as blanket, turban
- 76. Something to alleviate stiffness while lying down to get chemotherapy such as back-support pillow, arm-support clothes, etc.
- 78. Burning nose from odor of chemotherapy
- 81. Candies to alleviate throat irritation
- 82. Warm herbal drink to reduce throat irritation

#### Psychological (15 codes)

- 21. Conversation politely without blame
- 22. Encouragement from doctors and nurses
- 49. Husbands' understanding about limitations of sexual relationships
- 50. Stress and anxiety about disease and treatment
- 51. Confused and uncertain
- 52. Encouragement from family in admitting illness and treatment
- 53. Encouragement and good words from family
- 54. Encouragement from remote family members
- 55. Do not want to meet anyone outside house and want to rest quietly at home
- 56. Anxious about changing appearance
- 57. Acceptance from family about changes without disdainful gesture
- 58. Embarrassed and do not want to meet people
- 59. Phone call from remote family members
- 83. Encouragement while undergoing chemotherapy
- 86. Do not want to be a burden for family

**Useful information (35 codes)**

1. Information about breast cancer and one own treatment
2. Explanation about kinds of food that should be eaten and should be avoided
4. Information about side effect of chemotherapy
5. Information about use of herbs together with chemotherapy
6. Information about other alternative treatments
7. Information about treatment expense and use of treatment right
8. Information about additional expense beyond treatment right and practice guideline
10. Information about duration of chemotherapy treatment
11. Information about recurrence of the disease
12. Information about chance of survival
13. Treatment approach after completion of chemotherapy
14. Information about traditional folk medicine used to cure cancer
15. Suggestions for chemotherapy first-timers
17. Explanation or instructions without inquiry from patients
18. Instructions and recommendations while waiting to see the doctor
19. Explanation with clear and understandable details
20. Time for doctors to provide explanations or suggestions
23. Mediator between patient and family
26. Suggestions from those with direct experiences
27. Information about blood examination before chemotherapy
28. Suggestions about behaviors that promote cure from breast cancer
29. Suggestions about correct behaviors
31. Self-care during recovery at home
32. Information about doing activities in daily life
33. Information about types of activities and chores that could or could not do
35. Information about supplement food and vitamins
36. Information about supplementary protein
38. Information about food replacement
48. Suggestions to prevent infection
88. Information about sexual relationship
89. Information about side effect of chemotherapy on sexual relationship
90. Guidelines for using the arm on the operated side
91. Guidelines for behavior that would increase platelets
92. Personal advise
95. Conversation with someone with similar experience



**Family involvement (15 codes)**

- 24. Family accompaniment to see doctor in examination room
- 25. Family involvement in getting information and making decision
- 37. Avoid food that induce nausea
- 39. Family involve in food preparation
- 40. Family prepares sour fruits or food to alleviate nausea
- 41. Family prepares vegetarian food
- 43. Family does housework during exhaustive stage
- 44. Family does other business while I cannot do by myself
- 45. Special care from family in the first week after chemotherapy
- 67. Remind of appointment date to see doctor
- 68. Cousins to take me to and from hospitals to get chemotherapy
- 69. Support and assistances in submitting OPD card
- 77. Assistance to toilet while getting chemotherapy at hospitals
- 84. Accompaniment of cousins while undergoing chemotherapy at hospitals
- 87. Depend firstly on assistance from family

**Health service support (18 codes)**

- 9. Treatment according to their rights with no additional expense
- 16. Services for chemotherapy first-timers
- 47. Turbans or hats to cover hairless head
- 62. Vehicle support to travel to and from hospital to get chemotherapy
- 64. Vehicle to travel to and from hospital to get chemotherapy
- 65. Support for accommodation or accommodation fee
- 66. Support food for both patients and cousins when undergoing chemotherapy at hospitals
- 70. Facilitating examination in the right time
- 71. Facilitation and assistances from staff in various steps of undergoing chemotherapy
- 72. Assistances in taking to examination in various sites
- 73. Examine blood to prepare body readiness and undergo chemotherapy within the same day
- 79. Periodically visit by nurses while lying down to get chemotherapy
- 80. Resting quietly without disturbance from others while getting chemotherapy
- 93. 24-hour consultation service
- 94. House-visit by volunteers or nurses from nearby hospitals
- 96. Support for wigs
- 97. Supplementary food and career for additional income
- 98. Need the nurses who are expert in injecting veins

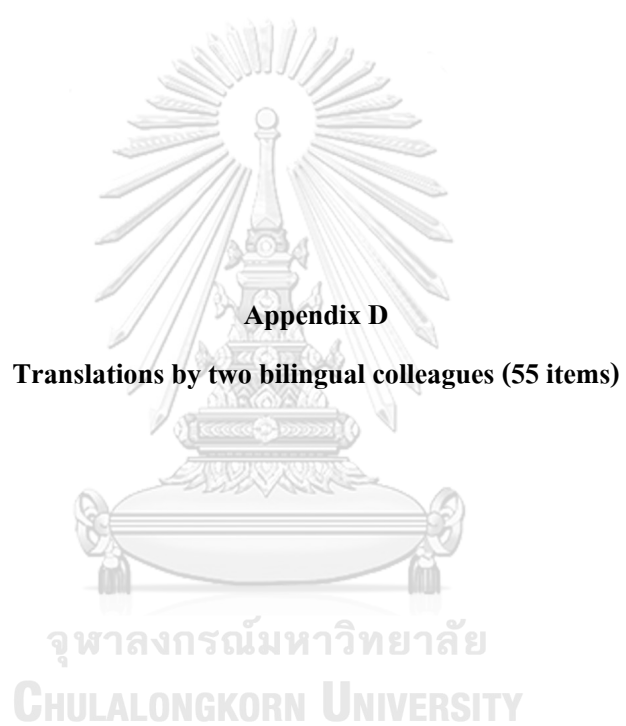
**Financial problem-solving (3 codes)**

- 34. Occupation or work that could be done to increase income
- 61. Loan from cousins when lack money
- 63. Government support for additional expenses like travelling fare, accommodation fee, etc.

**Religion (2 codes)**

- 60. Family involves in taking to make merit
- 85. Spiritual anchor when feeling worried





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|---|---|---|
| 1. ฉันต้องการพยาบาลที่มีความเชี่ยวชาญในการแทงเส้นเลือดสำหรับให้ยาเคมีบำบัด  | 1. I need a nurse who is highly skilled in injecting vein for chemotherapy.   | 1. ฉันต้องการพยาบาลที่มีความเชี่ยวชาญในการฉีดยาเข้าเส้นเลือดดำสำหรับการทำเคมีบำบัด  |
| 2. ฉันต้องการนอนพักเฉยๆหรือนอนหลับในขณะที่รับยาเคมีบำบัด  | 2. I need peaceful rest or sleep while undergoing chemotherapy.   | 2. ฉันต้องการการพักผ่อนและการนอนหลับที่เงียบสงบ ขณะที่เข้ารับการทำเคมีบำบัด   |
| 3. ฉันต้องการผ้าห่ม หมอนหนุนหลัง หรือ ผ้ารองแขนข้างที่แขนงอขณะนอนรับยาเคมีบำบัด   | 3. I need a blanket, back-support pillow or arm-support blanket while undergoing chemotherapy.  | 3. ฉันต้องการผ้าห่มและหมอนรองหลัง หรือผ้าห่มพยุงแขนระหว่างที่เข้ารับเคมีบำบัด   |
| 4. ฉันต้องการมีคนพาไปห้องน้ำในระหว่างที่ได้รับยาเคมีบำบัด   | 4. I need someone to assist me to a toilet while undergoing chemotherapy.   | 4. ฉันต้องการคนช่วยพุงเมื่อต้องเข้าห้องน้ำในช่วงที่เข้ารับเคมีบำบัด   |
| 5. ฉันต้องการผ้าปิดปากและจมูกเพื่อบรรเทาอาการแสบจมูกจากกลิ่นยาเคมีบำบัด   | 5. I need a mask to reduce nasal congestion from the smell of chemotherapy.   | 5. ฉันต้องการผ้าปิดจมูกเพื่อลดอาการคัดจมูกจากกลิ่นของยาเคมีบำบัด  |
| 6. ฉันต้องการให้พยาบาลเดินมาซักถามอาการ หรือมาดูเป็นระยะๆในขณะที่นอนรับยาเคมีบำบัด  | 6. I need nurses to walk over to ask or inspect me periodically while undergoing chemotherapy.  | 6. ฉันต้องการให้พยาบาลเข้ามาถามอาการหรือตรวจดูเป็นระยะขณะที่อยู่ระหว่างการทำเคมีบำบัด   |
| 7. ฉันต้องการได้รับความช่วยเหลือเกี่ยวกับอาการเจ็บและแสบร้อนบริเวณที่แทงเข็ม  | 7. I need help about pain and burns at injection site.  | 7. ฉันต้องการความช่วยเหลือเมื่อเจ็บปวด และระบมในบริเวณที่ถูกฉีดยา   |
| 8. ฉันต้องการให้มีบริการลูกอม หรือน้ำสมุนไพรอุ่นๆ เช่น น้ำขิง น้ำใบเตย น้ำตะไคร้ จิบเพื่อบรรเทาอาการขมคือน้ำลายเหนียว ในระหว่างที่นอนรับยาเคมีบำบัด | 8. I need some candies or warm herbal drinks such as ginger juice, pandan juice, lime grass juice to relieve bitter taste and viscous saliva while undergoing chemotherapy. | 8. ฉันต้องการลูกอม หรือ เครื่องดื่มสมุนไพรอุ่นๆ อย่างเช่นน้ำขิง น้ำใบเตย น้ำตะไคร้ เพื่อลดอาการขมปากและน้ำลายเหนียวระหว่างที่รับเคมีบำบัด |

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| 9. ฉันต้องการให้แพทย์ พยาบาลพูดคุย<br>กับฉันด้วยถ้อยคำสุภาพ ไม่ตำหนิให้<br>รู้สึกไม่สบายใจ   | 9. I need doctors and<br>nurses to speak with me<br>politely with no<br>reprimand to make me<br>worry.   | 9. ฉันต้องการให้แพทย์และพยาบาล<br>พูดกับฉันอย่างสุภาพโดยที่ไม่มีท่าที่<br>ตำหนิที่จะทำให้ฉันกังวลใจ   |
| 10. ฉันรู้สึกท้อแท้หมดหวัง และ<br>ต้องการให้แพทย์ พยาบาลพูดให้<br>กำลังใจ  | 10. I feel discourage and<br>hopeless and need doctors<br>and nurses to cheer me<br>up.  | 10. ฉันรู้สึกหมดกำลังใจและสิ้นหวัง<br>จึงต้องการกำลังใจจากแพทย์และ<br>พยาบาล  |
| 11. ฉันต้องการให้แพทย์อนุญาตให้<br>ญาติเข้าไปในห้องตรวจจะพบแพทย์<br>ด้วย   | 11. I need doctors to<br>allow my cousins to<br>accompany me while I<br>meet with the doctor.  | 11. ฉันต้องการให้แพทย์อนุญาตให้<br>ญาติๆ เข้าไปพบหมอด้วยกันกับฉัน   |
| 12. ฉันต้องการให้ครอบครัวมีส่วน<br>ร่วมในการรับฟังข้อมูลและช่วย<br>ตัดสินใจเกี่ยวกับการเจ็บป่วยและการ<br>รักษาด้วยเคมีบำบัด          | 12. I need my family to<br>involve in listening to<br>information and make<br>decision about my<br>sickness and<br>chemotherapy treatment.   | 12. ฉันต้องการให้คนในครอบครัวมี<br>ส่วนร่วมในการรับฟังข้อมูลและร่วม<br>ตัดสินใจเกี่ยวกับอาการป่วยของฉัน<br>รวมทั้งการบำบัดด้วยเคมี            |
| 13. ฉันต้องการให้ครอบครัวคอย<br>เตือนเกี่ยวกับวันนัดในการมาตรวจและ<br>มารับยาเคมีบำบัดแต่ละครั้ง                                     | 13. I need my family to<br>warn me about each<br>appointment with doctors<br>and chemotherapy<br>treatment.  | 13. ฉันต้องการให้คนในครอบครัว<br>คอยเตือนเรื่องวันนัดหมายกับแพทย์และ<br>การทำเคมีบำบัดในแต่ละครั้ง  |
| 14. ฉันต้องการให้ครอบครัวมารับ-<br>ส่ง และอยู่ด้วยในขณะที่ฉันมารับยาเคมี<br>บำบัดที่โรงพยาบาล  | 14. I need my family to<br>accompany me and stay<br>with me while<br>undergoing chemotherapy<br>at the hospital.   | 14. ฉันต้องการให้ครอบครัวไปกับฉัน<br>และอยู่เฝ้าในระหว่างที่ทำเคมีบำบัดใน<br>โรงพยาบาล  |
| 15. ฉันต้องการให้ครอบครัวช่วยเหลือ<br>ในการยื่นบัตร พาไปเจาะเลือด<br>เอกซเรย์ หรือติดต่อที่ต่างๆ ในวันที่มา<br>ตรวจรักษาที่โรงพยาบาล | 15. I need my family to<br>help me in submitting<br>appointment card, blood<br>drawing, taking x-ray, or<br>contacting various<br>departments on my<br>treatment day at the<br>hospital. | 15. ฉันต้องการให้คนในครอบครัว<br>ช่วยยื่นใบนัดหมายในการเจาะเลือด การ<br>เอกซเรย์ หรือ ติดต่อกับแผนกต่างๆ ใน<br>วันที่รับเคมีบำบัดใน โรงพยาบาล |

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| 16. ฉันต้องการได้รับการนัดตรวจกับแพทย์ และการตรวจอื่นๆ เช่น ตรวจเลือด เอกซเรย์ และรับยาเคมีบำบัดในวันเดียวกัน  | 16. I need to have appointment to meet with doctors and other appointments such as blood test, x-ray, and chemotherapy on the same day.  | 16. ฉันต้องการการนัดหมายเพื่อพบแพทย์ และการนัดหมายอื่นๆ เช่นการตรวจเลือด เอกซเรย์ และทำเคมีบำบัดในวันเดียวกัน   |
| 17. ฉันต้องการได้รับการสนับสนุนเรื่องค่าใช้จ่ายในการรักษาทั้งหมดตามสิทธิการรักษา   | 17. I need treatment expense support according to my treatment right.  | 17. ฉันต้องการการสนับสนุนเรื่องค่าใช้จ่ายตามสิทธิในการรักษาพยาบาลที่ฉันควรได้   |
| 18. ฉันต้องการได้รับสวัสดิการจากรัฐบาลในการสนับสนุนเรื่องค่าใช้จ่ายอื่นๆ ในการมารับยาเคมีบำบัดที่โรงพยาบาล เช่น ค่ารถ ค่าน้ำมัน ค่าเดินทาง ค่าที่พัก และค่าอาหาร | 18. I need to get government's welfare to support my other expenses concerning chemotherapy treatment at the hospital, such as bus fare, fuel expense, travel expense, accommodation and food expense. | 18. ฉันต้องการรับค่ารักษาพยาบาลที่เป็นสวัสดิการจากรัฐเพื่อช่วยค่าใช้จ่ายอื่นๆ ที่เกี่ยวกับเคมีบำบัดในโรงพยาบาล เช่น ค่ารถประจำทาง ค่าน้ำมันรถ ค่าเดินทาง ค่าที่พักและค่าอาหาร |
| 19. ฉันต้องการให้แพทย์/พยาบาลใช้เวลาในการอธิบาย และให้คำแนะนำต่างๆ   | 19. I need doctors / nurses to take time to explain and give me suggestions.   | 19. ฉันต้องการให้แพทย์/พยาบาล ใช้เวลาในการอธิบายและให้คำแนะนำแก่ฉัน   |
| 20. ฉันต้องการคำปรึกษาเป็นรายบุคคลมากกว่าการแนะนำเป็นรายกลุ่ม  | 20. I need individual consult rather than group suggestions.   | 20. ฉันต้องการได้รับคำปรึกษาเฉพาะตัวมากกว่าจะเป็นคำแนะนำที่ให้โดยทั่วๆ ไป   |
| 21. ฉันต้องการให้แพทย์ หรือพยาบาลเป็นสื่อกลางในการอธิบายกับคนในครอบครัวเกี่ยวกับสภาพการเจ็บป่วยและการรักษาของฉัน   | 21. I need doctors or nurses to explain to my family about my illness conditions and treatments.   | 21. ฉันต้องการให้แพทย์หรือพยาบาลอธิบายให้คนในครอบครัวของฉันฟังเกี่ยวกับเงื่อนไขในการเจ็บป่วยและการดูแลรักษา   |
| 22. ฉันต้องการให้มีพยาบาล หรือนักโภชนาการให้ความรู้ หรือตอบข้อซักถามต่างๆขณะรอพบแพทย์  | 22. I need nurses or nutritionists to give knowledge or answer questions while I wait for the doctor.  | 22. ฉันต้องการให้พยาบาลหรือนักโภชนาการ ให้ความรู้หรือตอบคำถามของฉันขณะที่รอแพทย์อยู่  |

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| 23. ฉันต้องการคำอธิบายจากแพทย์เกี่ยวกับลักษณะ/ชนิด/ระยะและความรุนแรงของโรคมะเร็งเต้านมที่ฉันกำลังเป็นอยู่ | 23. I need explanations from doctors about features / types and severity of my breast cancer.          | 23. ฉันต้องการคำอธิบายจากแพทย์เกี่ยวกับ ลักษณะ/ ชนิด และความรุนแรงของอาการมะเร็งเต้านมที่ฉันเป็นอยู่           |
| 24. ฉันต้องการทราบข้อมูลเกี่ยวกับแนวทางการรักษา และระยะเวลาในการรักษาจนกว่าจะหายขาด                       | 24. I need to know information about approach and duration of treatment until I'm cured.               | 24. ฉันต้องการทราบถึงข้อมูลเกี่ยวกับวิธีการและระยะเวลาในการรักษาจนฉันหายเป็นปกติ                               |
| 25. ฉันต้องการทราบรายละเอียดค่าใช้จ่ายในการรักษา และแนวทางการใช้สิทธิการรักษาโดยไม่เสียค่าใช้จ่าย         | 25. I need details of treatment expenses and how to use my right to treatment without paying expenses. | 25. ฉันต้องการรายละเอียดของค่าใช้จ่ายในการรักษา และวิธีใช้สิทธิในการรักษาโดยไม่ต้องจ่าย                        |
| 26. ฉันต้องการให้แพทย์บอกความก้าวหน้าของโรค และการรักษาของฉันเป็นระยะๆ                                    | 26. I need doctors to tell me about the progress of my disease and treatment periodically.             | 26. ฉันต้องการให้แพทย์บอกถึงความคืบหน้าของโรคและการรักษาเป็นระยะๆ  |
| 27. ฉันต้องการข้อมูลเกี่ยวกับทางเลือกอื่นๆในการรักษานอกจากการรักษาด้วยเคมีบำบัด                           | 27. I need information about other treatment alternatives other than chemotherapy.                     | 27. ฉันต้องการข้อมูลเกี่ยวกับทางเลือกในการรักษาแบบอื่นๆ ที่นอกเหนือจาก เคมีบำบัด                               |
| 28. ฉันต้องการคำชี้แจงเกี่ยวกับการใช้สมุนไพรร่วมกับการรักษาด้วยยาเคมีบำบัด                                | 28. I need explanations about using herbs along with chemotherapy.                                     | 28. ฉันต้องการคำอธิบายในการใช้สมุนไพรที่ใช้ไปพร้อมกับเคมีบำบัดได้  |
| 29. ฉันต้องการคำแนะนำเกี่ยวกับฤทธิ์ข้างเคียงของยาเคมีบำบัดที่มีผลต่อร่างกาย                               | 29. I need suggestions about side effects of chemotherapy on my body.                                  | 29. ฉันต้องการคำแนะนำเกี่ยวกับผลข้างเคียงของเคมีบำบัดที่มีต่อร่างกายของฉัน                                     |
| 30. ฉันต้องการคำอธิบายเกี่ยวกับการตรวจเลือดก่อนการรับยาเคมีบำบัด ได้แก่ การตรวจเม็ดเลือดขาว เกล็ดเลือด    | 30. I need explanations about blood test before chemotherapy, i.e. white blood and platelets test.     | 30. ฉันต้องการคำอธิบายเกี่ยวกับผลเลือดก่อนที่จะเข้ารับเคมีบำบัด อย่างเช่น เม็ดเลือดขาว และการตรวจวัดเกล็ดเลือด |

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|--|---|--|
| 31. ฉันต้องการคำแนะนำเรื่องการปฏิบัติตัวที่ส่งเสริมให้ผลตรวจเลือดมีค่าปกติและสามารถรับยาเคมีบำบัดได้อย่างต่อเนื่อง | 31. I need suggestions about behaviors that will make my blood test normal and enable me to endure continuous chemotherapy. | 31. ฉันต้องการคำแนะนำเกี่ยวกับ การปฏิบัติตัวที่จะทำให้ผลเลือดของฉันเป็นปกติและ ทำให้ฉันทนกับเคมีบำบัดและทำการรักษาต่อไปได้ |
| 32. ฉันต้องการคำแนะนำการปฏิบัติตัวเพื่อช่วยให้ตนเองหายจากโรคมะเร็งเต้านมที่กำลังเป็นอยู่                           | 32. I need suggestions on behaviors that will help me cured from my breast cancer.  | 32. ฉันต้องการคำแนะนำในการปฏิบัติตัวที่จะช่วยให้ฉันหายจากมะเร็งเต้านม  |
| 33. ฉันต้องการข้อมูลเกี่ยวกับกิจกรรมต่างๆ และงานที่สามารถทำได้ในช่วงที่เจ็บป่วยและรักษาด้วยยาเคมีบำบัด             | 33. I need information about activities and works I can do during my sickness and chemotherapy treatment.                   | 33. ฉันต้องการข้อมูลเกี่ยวกับกิจกรรมและงานที่ฉันสามารถทำได้ในระหว่างที่ป่วยและรับเคมีบำบัดอยู่                             |
| 34. ฉันต้องการคำแนะนำเกี่ยวกับข้อปฏิบัติในการใช้แขนข้างที่เป็นมะเร็งเต้านมในการทำกิจกรรมต่างๆ                      | 34. I need suggestions about guidelines in using my arm on the breast cancer side in doing various activities.              | 34. ฉันต้องการคำแนะนำเกี่ยวกับแนวทางในการใช้แขนข้างเดียวกับเต้านมที่เป็นมะเร็งในการทำกิจกรรมต่างๆ                          |
| 35. ฉันต้องการคำแนะนำเกี่ยวกับชนิดของอาหารที่ควรรับประทาน และอาหารที่ควรหลีกเลี่ยง                                 | 35. I need suggestions about types of food to take and types of food to avoid.  | 35. ฉันต้องการคำแนะนำเกี่ยวกับประเภทของอาหารที่ทานได้และประเภทของอาหารที่ควรเลี่ยง   |
| 36. ฉันต้องการคำแนะนำเรื่องทางเลือก และอาหารทดแทนเฉพาะรายบุคคล เช่น อาหารเสริม หรือวิตามินต่างๆ                    | 36. I need suggestions about individual alternatives and replacing food, such as supplementary or vitamins.                 | 36. ฉันต้องการคำแนะนำเกี่ยวกับอาหารที่เป็นทางเลือกเฉพาะของแต่ละคนและ สิ่งทดแทนอาหารเช่น อาหารเสริมหรือวิตามิน              |
| 37. ฉันต้องการพูดคุยเพื่อแลกเปลี่ยนประสบการณ์ของตัวเองกับคนที่ป่วยและอยู่ในภาวะเดียวกัน                            | 37. I need to talk to exchange my experiences with other patients in the same conditions.                                   | 37. ฉันต้องการพูดคุยแลกเปลี่ยนประสบการณ์กับคนไข้คนอื่นๆ ที่มีอาการเดียวกัน   |
| 38. ฉันต้องการบรรเทาอาการคลื่นไส้อาเจียนหลังจากได้รับยาเคมีบำบัด   | 38. I need to relieve my nausea after chemotherapy treatment.   | 38. ฉันต้องการบรรเทาอาการคลื่นไส้หลังจากการทำเคมีบำบัด   |



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|---|--|---|
| 39. ฉันมีอาการนอนไม่หลับ และ<br>ต้องการได้รับความช่วยเหลือ  | 39. I cannot sleep and I<br>need assistance about<br>this.   | 39. ฉันนอนไม่หลับและต้องการความ<br>ช่วยเหลือในเรื่องนี้   |
| 40. ฉันต้องการให้พยาบาลที่<br>โรงพยาบาลใกล้บ้านมาเยี่ยมที่บ้าน<br>ในช่วง 2-3 วันหลังกลับจากรับยาเคมี<br>บำบัดแต่ละครั้ง | 40. I need nurse from the<br>nearby hospital to visit<br>me at my home in 2-3<br>days after each<br>chemotherapy treatment.                                    | 40. ฉันต้องการให้พยาบาลจาก<br>โรงพยาบาลใกล้เคียงมาเยี่ยมดูอาการฉัน<br>ที่บ้าน หลังจากทำเคมีบำบัดได้สองสาม<br>วัน              |
| 41. ฉันต้องการให้ครอบครัวจัดเตรียม<br>อาหารที่ฉันสามารถรับประทานได้ใน<br>ช่วงเวลาที่ฉันรู้สึกเบื่ออาหาร                 | 41. I need my family to<br>prepare food I can eat<br>when I lose my appetite.  | 41. ฉันต้องการให้คนในครอบครัว<br>จัดเตรียมอาหารที่ฉันทานได้เมื่อมีอาการ<br>ทานข้าวไม่ได้                                      |
| 42. ฉันต้องการให้คนในครอบครัว<br>ทำงานบ้านแทนในช่วงเวลาที่ฉัน<br>อ่อนเพลียมาก   | 42. I need my family<br>member to do housework<br>for me during the time I<br>feel very tired.   | 42. ฉันต้องการให้สมาชิกใน<br>ครอบครัวทำงานบ้านให้ในระหว่างที่<br>ฉันอ่อนเพลียมากๆ   |
| 43. ฉันต้องการให้คนในครอบครัว<br>ติดต่อทำธุระแทนในช่วงเวลาที่ฉันไม่<br>สามารถออกไปไหนได้                                | 43. I need my family<br>member to run errand for<br>me during the time I<br>cannot go out.   | 43. ฉันต้องการให้คนในครอบครัว<br>ออกไปทำธุระให้ในช่วงเวลาที่ฉันไม่<br>สามารถออกจากบ้านได้                                     |
| 44. ฉันต้องการให้คนรัก/สามีเข้าใจ<br>ข้อจำกัดในการมีเพศสัมพันธ์ที่เกิดจาก<br>โรคและผลข้างเคียงจากการรักษา               | 44. I need my<br>boyfriend/husband to<br>understand my limitations<br>in sexual relationship<br>caused by the disease and<br>side effects of the<br>treatment. | 44. ฉันต้องการให้แฟนของฉัน/สามี<br>ของฉัน เข้าใจถึงข้อจำกัดในการมี<br>เพศสัมพันธ์ที่มีผลมาจากโรคและ<br>ผลข้างเคียงของการรักษา |
| 45. ฉันรู้สึกเครียดและวิตกกังวลกับ<br>การเจ็บป่วยและการรักษาครั้งนี้จน<br>ต้องการความช่วยเหลือจากแพทย์และ<br>พยาบาล     | 45. I feel so anxious and<br>worried with my sickness<br>and treatment that I need<br>help from doctors and<br>nurses.   | 45. ฉันรู้สึกกระวนกระวายใจและ<br>กังวลใจเกี่ยวกับอาการป่วยและการ<br>รักษา จนฉันต้องการความช่วยเหลือจาก<br>แพทย์และพยาบาล      |
| 46. ฉันยังทำใจยอมรับการเจ็บป่วย<br>และการรักษาไม่ได้ และต้องการ<br>กำลังใจจากครอบครัว                                   | 46. I still cannot accept<br>my sickness and<br>treatment and need<br>encouragement from my<br>family.   | 46. ฉันยังไม่สามารถยอมรับอาการ<br>ป่วยของตัวเองรวมทั้งการรักษาตัวได้<br>และต้องการกำลังใจจากครอบครัว                          |

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|---|---|--|
| 47. ฉันต้องการให้คนในครอบครัวพูดจากับฉันดีๆ ไม่ใช่คำพูดที่ทำให้คิดมากหรือรู้สึกน้อยใจ                                   | 47. I need my family to speak with me sweetly and does not use words that will make me feel frustrated or hurt.                 | 47. ฉันต้องการให้คนในครอบครัวพูดจาไพเราะอ่อนหวานกับฉันและไม่ใช้ถ้อยคำที่ทำให้ฉันรู้สึกแยะหรือเจ็บปวด                                   |
| 48. ฉันต้องการให้คนในครอบครัวยอมรับกับสภาพร่างกายของฉันที่เปลี่ยนแปลงจากความเจ็บป่วยและการรักษาโดยไม่แสดงท่าที่รังเกียจ | 48. I need my family to accept my body condition that changes from sickness and treatment without any dislike or embarrassment. | 48. ฉันต้องการให้ครอบครัวของฉันยอมรับสภาพร่างกายที่เปลี่ยนไปเนื่องจากโรคและการรักษาโดยที่ไม่มีการรังเกียจหรือท่าที่อับอาย              |
| 49. ฉันต้องการให้คนในครอบครัวที่อยู่ห่างไกล โทรศัพท์มาพูดคุยให้กำลังใจ  | 49. I need my remote family member to make a phone call to talk and encourage me.   | 49. ฉันต้องการให้สมาชิกครอบครัวที่อยู่ไกล โทรศัพท์มาหาเพื่อพูดคุยและให้กำลังใจฉัน  |
| 50. ฉันต้องการให้ครอบครัวพาไปทำบุญ ทำทาน สร้างกุศลให้มีความตั้งใจมากขึ้น  | 50. I need my family to bring me to make merit, donate and do good deeds to encourage me.                                       | 50. ฉันต้องการให้คนในครอบครัวพาฉันไปทำบุญ บริจาคทานและ สร้างกุศลเพื่อให้ฉันมีความตั้งใจ  |
| 51. ฉันต้องการได้รับการสนับสนุนวิกผม หมวก ผ้าโพกศีรษะจากโรงพยาบาล   | 51. I need support for wigs, hats, and turbans from the hospital.   | 51. ฉันต้องการการสนับสนุนเรื่องวิกผม หมวกและผ้าโพกผมจากโรงพยาบาล   |
| 52. ฉันต้องการได้รับการสนับสนุนจากโรงพยาบาลเรื่องอาหารเสริมที่ไม่สามารถซื้อรับประทานเองได้                              | 52. I need support for supplementary food that I cannot afford from the hospital.   | 52. ฉันต้องการการสนับสนุนในเรื่องอาหารเสริมที่ฉันไม่สามารถหาเองได้จากโรงพยาบาล   |
| 53. ฉันต้องการการสนับสนุนเรื่องอาชีพ/การทำงานเพื่อให้มีรายได้ทดแทนงานเดิมที่ไม่สามารถทำได้ในช่วงนี้                     | 53. I need support for vocation/work to earn income in replacement of the old work that I cannot do during this time.           | 53. ฉันต้องการการสนับสนุนด้านงานอาชีพเพื่อหารายได้ทดแทนจากงานเดิมที่ฉันไม่สามารถทำได้ในช่วงเวลาเช่นนี้                                 |
| 54. ฉันต้องการความช่วยเหลือจากครอบครัว และญาติเรื่องเงินสำรองในกรณีฉุกเฉิน  | 54. I need financial help from my family and cousins when in need.  | 54. ฉันต้องการความช่วยเหลือทางการเงินจากครอบครัวและญาติๆ เมื่อยามจำเป็น  |
| 55. ฉันต้องการการบริการให้คำปรึกษาทางโทรศัพท์ 24 ชม. เมื่อเกิดปัญหาหรือข้อสงสัยขณะอยู่ที่บ้าน                           | 55. I need 24-hour phone consult when I have problems or doubts while I stay home.  | 55. ฉันต้องการให้มีโปรแกรมที่ปรึกษาทางโทรศัพท์ ที่สามารถโทรหาได้ตลอด 24 ชั่วโมง เมื่อใดก็ตามที่มีปัญหาหรือข้อสงสัยขณะที่ฉันอยู่ที่บ้าน |



### Panel of seven experts

1. Associate Professor Dr. Tipaporn Wonghongkul  
Faculty of Nursing, Chiang Mai University
2. Associate Professor Dr. Kanaungnit Pongthavornkamol  
Faculty of Nursing, Mahidol University
3. Assistant Professor Dr. Tiraporn Junda  
Ramathibodi School of Nursing, Mahidol University
4. Bencharat Thumpreechamong M.N.S., APN.  
Chulalongkorn Hospital
5. Manmana Jirajarus, M.N.S., APN.  
Ramathibodi Hospital
6. Pornchan Sailamai, M.N.S., APN.  
National Cancer Institute
7. Ubol Juangpanich, M.N.S., APN.  
Srinagarind Hospital





IRB No. 080/ 60

คณะกรรมการจริยธรรมการวิจัยในมนุษย์  
โรงพยาบาลพุทธชินราช พิษณุโลก  
90 ถนนศรีธรรมไตรปิฎก อำเภอเมือง จังหวัดพิษณุโลก 65000

เอกสารรับรองโครงการวิจัย

คณะกรรมการจริยธรรมการวิจัยในมนุษย์ โรงพยาบาลพุทธชินราช พิษณุโลก ดำเนินการให้การรับรองโครงการวิจัยตามแนวทางหลักจริยธรรมการวิจัยในมนุษย์ที่เป็นมาตรฐานสากล ได้แก่ Declaration of Helsinki, The Belmont Report, CIOMS Guideline และ International Conference on Harmonization in Good Clinical Practice (ICH – GCP)

ชื่อโครงการ : การพัฒนาเครื่องมือแบบประเมินความต้องการการดูแลสนับสนุนของหญิงไทยที่เป็นมะเร็งเต้านมขณะรับการรักษาเคมีบำบัด

ชื่อหัวหน้าโครงการ : นางสาวสุภาณี คลังฤทธิ์

เลขที่โครงการวิจัย/รหัส :

สังกัดหน่วยงาน : นักศึกษาปริญญาเอก คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

วิธีทบทวน : แบบเร่งรัด (Expedited Review)

รายงานความก้าวหน้า : ส่งรายงานความก้าวหน้าอย่างน้อย 1 ครั้ง/ ปี หรือส่งรายงานฉบับสมบูรณ์หากดำเนินโครงการเสร็จสิ้นก่อน 1 ปี

เอกสารรับรอง : 1.แบบเสนอโครงการวิจัย  
2.โครงร่างวิจัยฉบับสมบูรณ์  
3.เอกสารชี้แจงข้อมูลวิจัย  
4.หนังสือแสดงความยินยอมเข้าร่วมโครงการวิจัย  
5.แนวคำถามการสัมภาษณ์

วันที่รับรอง : 22 สิงหาคม 2560

วันหมดอายุ : 21 สิงหาคม 2561

ลงนาม.....

(แพทย์หญิงอรพรรณ ไชยมหาพฤกษ์)

ประธานคณะกรรมการจริยธรรมการวิจัยในมนุษย์

ทั้งนี้ การรับรองนี้มีเงื่อนไขดังที่ระบุไว้ด้านหลังทุกข้อ (ดูด้านหลังของเอกสารรับรองโครงการวิจัย)



IRB No. 080/ 61

คณะกรรมการจริยธรรมการวิจัยในมนุษย์  
โรงพยาบาลพุทธชินราช พิษณุโลก  
90 ถนนศรีธรรมไตรปิฎก อำเภอเมือง จังหวัดพิษณุโลก 65000

เอกสารรับรองโครงการวิจัย

คณะกรรมการจริยธรรมการวิจัยในมนุษย์ โรงพยาบาลพุทธชินราช พิษณุโลก ดำเนินการให้การรับรองโครงการวิจัยตามแนวทางหลักจริยธรรมการวิจัยในมนุษย์ที่เป็นมาตรฐานสากล ได้แก่ Declaration of Helsinki, The Belmont Report, CIOMS Guideline และ International Conference on Harmonization in Good Clinical Practice (ICH – GCP)

ชื่อโครงการ : การพัฒนาเครื่องมือแบบประเมินความต้องการการดูแลสนับสนุนของหญิงไทยที่เป็นมะเร็งเต้านมขณะรับการรักษาเคมีบำบัด

ชื่อหัวหน้าโครงการ : นางสาวสุภาณี คลังฤทธิ

เลขที่โครงการวิจัย/รหัส :

สังกัดหน่วยงาน : นักศึกษาปริญญาเอก คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

วิธีทบทวน : แบบเร่งรัด (Expedited Review)

รายงานความก้าวหน้า : ส่งรายงานความก้าวหน้าอย่างน้อย 1 ครั้ง/ ปี หรือส่งรายงานฉบับสมบูรณ์หากดำเนินการเสร็จสิ้นก่อน 1 ปี

เอกสารรับรอง : 1.แบบเสนอโครงการวิจัย  
2.โครงร่างวิจัยฉบับสมบูรณ์  
3.เอกสารชี้แจงข้อมูล  
4.หนังสือแสดงความยินยอมเข้าร่วมโครงการวิจัย  
5.แบบสอบถาม

วันที่รับรอง : 22 สิงหาคม 2561

วันหมดอายุ : 21 สิงหาคม 2562

ลงนาม..... *On Su*

(แพทย์หญิงอรวรรณ ไชยมหาพฤกษ์)

ประธานคณะกรรมการจริยธรรมการวิจัยในมนุษย์

ทั้งนี้ การรับรองนี้มีเงื่อนไขดังที่ระบุไว้ด้านหลังทุกข้อ (ดูด้านหลังของเอกสารรับรองโครงการวิจัย)



โรงพยาบาลมะเร็งลำปาง  
LAMPANG CANCER HOSPITAL

ใบรับรองโครงการวิจัย

คณะกรรมการวิจัยและพิจารณาจริยธรรมการวิจัยในมนุษย์

โรงพยาบาลมะเร็งลำปาง

เลขที่หนังสือ ๔๓ / ๒๕๖๑

ชื่อโครงการ: การพัฒนาเครื่องมือแบบประเมินความต้องการการดูแลสนับสนุนของหญิงไทย  
ที่เป็นมะเร็งเต้านมขณะรับการรักษาเคมีบำบัด

ชื่อหัวหน้าโครงการ: นางสาวสุภาณี คลิ่งฤทธิ์

หน่วยงานที่สังกัด: คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

สถานที่ทำวิจัย: โรงพยาบาลมะเร็งลำปาง

เอกสารที่รับรอง : แบบเสนอโครงการวิจัย  
เอกสารชี้แจงข้อมูล/คำแนะนำแก่ผู้เข้าร่วมการวิจัย  
หนังสือแสดงความยินยอมเข้าร่วมการวิจัย  
แบบสอบถาม

วันที่รับรอง: ๒ สิงหาคม ๒๕๖๑

วันที่สิ้นสุดการรับรอง: ๑ สิงหาคม ๒๕๖๒

รายงานความก้าวหน้า: -

คณะกรรมการวิจัยและพิจารณาจริยธรรมการวิจัยในมนุษย์ โรงพยาบาลมะเร็งลำปาง  
ได้พิจารณาและมีมติรับรองเอกสารที่ระบุไว้ข้างต้น โดยยึดหลักการจริยธรรมแห่งคำประกาศเฮลซิงกิ

ลงนาม..... *Signature* .....

(นายคลสุท พงษ์นิกร)

ประธานคณะกรรมการวิจัยและพิจารณาจริยธรรมการวิจัยในมนุษย์

ลงนาม..... *Signature* .....

(นายอดิศักดิ์ ภัตตาดำ)

ผู้อำนวยการโรงพยาบาลมะเร็งลำปาง



NO.96/61

แบบรับรองการดำเนินการวิจัยในมนุษย์  
คณะกรรมการจริยธรรมวิจัยในมนุษย์ โรงพยาบาลลำปาง

1.ชื่อโครงการวิจัย (ภาษาไทย) การพัฒนาเครื่องมือแบบประเมินความต้องการการดูแลสนับสนุนของหญิงไทย  
ที่เป็นมะเร็งเต้านมขณะรับยาเคมีบำบัด  
(ภาษาอังกฤษ) The Development of Supportive Care Needs Scale for Thai Women with  
Breast Cancer Undergoing Chemotherapy

2.ชื่อหัวหน้าโครงการวิจัย นางสาวสุภาณี คลังฤทธิ์  
หน่วยงานที่สังกัด คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย  
โทรศัพท์ 081-8884043  
ชื่อผู้วิจัยร่วม -

ความคิดเห็นของคณะกรรมการรักษามาตรฐานและจริยธรรมวิชาชีพ โรงพยาบาลลำปาง

- อนุมัติให้ดำเนินการวิจัยได้  
 ไม่อนุมัติ เหตุผล..

( ญ.กุลวดี เขียววานิช )  
ประธานคณะกรรมการจริยธรรมวิจัยในมนุษย์  
โรงพยาบาลลำปาง  
วันที่ 14 เดือน สิงหาคม พ.ศ. 2561



## Certificate of Ethics Committee in Human Research

**Research title :** The Development of Supportive Care Needs Scal for Thai Women With Breast Cancer Undergoing Chemotherapy

**Research number :** UCH 14/2561

**Principal investigators :** Miss Supanee Klungrit

**Count unit :** Faculty of Nursing, Chulalongkorn University

**Date of approval :** 3 October 2018      **End approval** 2 October 2019

| Approval document                                   | Reference (e.g.version and date)                                |
|---|---|
| Research protocol                                   | protocol synopsis and research proposal for ethics committee    |
| Patient Information Sheet/Informed Consent Document | - Patient Information Sheet<br>- Informed Consent Form          |
| Other   | - Case Record Form<br>- Principal Investigator Curriculum Vitae |

A handwritten signature in black ink, appearing to read "Rawin Ingsirorat".

(Rawin Ingsirorat, M.D)

chairman of ethics committee

Udonthani Cancer Hospital

A handwritten signature in black ink, appearing to read "Isara Chiawiriyabunya".

(Isara Chiawiriyabunya, M.D.)

Director of Udonthani Cancer Hospital



เลขที่รับรองEC ที่ ๔๗/๒๕๖๑

โรงพยาบาลอุดรธานี  
หนังสือฉบับนี้ให้ไว้เพื่อแสดงว่า

## โครงการวิจัยเรื่อง :

ภาษาไทย : การพัฒนาเครื่องมือแบบประเมินความต้องการการดูแลสนับสนุนของหญิงไทยที่เป็นมะเร็งเต้านม  
ขณะรับการรักษาเคมีบำบัด

ภาษาอังกฤษ : The Development of supportive care needs scale for Thai women with breast cancer  
undergoing chemotherapy

ผู้วิจัยหลัก : นางสาวสุภาณี คลังฤทธิ

ผู้ร่วมวิจัย : -

หน่วยงานของผู้วิจัยหลัก : คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

## สำหรับเอกสาร :

- ๑.แบบเสนอโครงการวิจัยเพื่อรับการพิจารณาจริยธรรมการทำวิจัยในมนุษย์ โรงพยาบาลอุดรธานี
- ๒.ประวัติและความชำนาญของนักวิจัย
- ๓.เอกสารชี้แจงข้อมูล/คำแนะนำแก่ผู้เข้าร่วมการวิจัย
- ๔.หนังสือแสดงความยินยอมเข้าร่วมการวิจัย
- ๕.หนังสือรับรองจริยธรรมการวิจัยในมนุษย์ เลขที่หนังสือ ๔๗/๒๕๖๑, IRB No.080/61
- ๖.แบบสอบถามการวิจัย

ได้ผ่านการรับรองจากคณะกรรมการจริยธรรมการวิจัยในมนุษย์โรงพยาบาลอุดรธานี โดยยึดหลักเกณฑ์ตามคำประกาศ  
เฮลซิงกิ (declaration of Helsinki) และแนวทางการปฏิบัติการวิจัยทางคลินิกที่ดี (ICH GCP) โดยขอให้รายงานความก้าวหน้า  
ของโครงการวิจัยทุก ๑๒ เดือน

ให้ไว้ ณ วันที่ ๘ พฤศจิกายน พ.ศ. ๒๕๖๑

  
(นางสาวสุกัญญา ภัยเหล็กลี)  
นายแพทย์เชี่ยวชาญ

ประธานคณะกรรมการจริยธรรมการวิจัยในมนุษย์ โรงพยาบาลอุดรธานี

วันหมดอายุ : ๘ พฤศจิกายน ๒๕๖๑

โรงพยาบาลอุดรธานี

๓๓ ถ.เพาะนิยม ต.หมากแข้ง อ.เมือง จ.อุดรธานี

โทร (๐๔๒)๒๔๕๕๕๕ ต่อ ๓๔๑๙ , โทรสาร (๐๔๒)๒๔๗๗๑๑

คู่มือการดำเนินงานของคณะกรรมการจริยธรรมการวิจัยในคนโรงพยาบาลสระบุรี ฉบับที่ ๒

18 ถนนเทศบาล 4  
อำเภอเมือง จังหวัดสระบุรี



โทรศัพท์ 036-343500  
โทรสาร 036-211624

เอกสารรับรองโครงการ

คณะกรรมการจริยธรรมการวิจัยในคน โรงพยาบาลสระบุรี

เลขที่ 156/2018

ชื่อโครงการภาษาไทย : การพัฒนาเครื่องมือแบบประเมินความต้องการการดูแลสนับสนุนของหญิงไทยที่เป็นมะเร็งเต้านมขณะรับการรักษาเคมีบำบัด  
รหัสโครงการ : EC181/02/2018  
หัวหน้าโครงการ : นางสาวสุภาณี คลังฤทธิ  
สถานที่ทำวิจัย : โรงพยาบาลสระบุรี

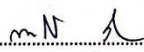
เอกสารที่รับรอง :

1. แบบเสนอโครงการวิจัยเพื่อขอรับการพิจารณาจากคณะกรรมการจริยธรรมการวิจัยในคน
2. โครงร่างการวิจัย
3. แบบสอบถาม
4. ประวัติผู้วิจัย

วันที่รับรอง : 5 ตุลาคม 2562

วันหมดอายุ : 5 ตุลาคม 2562

คณะกรรมการจริยธรรมการวิจัยในคน โรงพยาบาลสระบุรี ดำเนินการให้การรับรองโครงการวิจัยตามแนวทางหลังจริยธรรมการวิจัยในคนที่เป็นสากล ได้แก่ Declaration of Helsinki, The Belmont Report, CIOMS Guidelines และ The International Conference on Harmonization in Good Clinical Practice (ICH-GCP)

  
.....  
(นายแพทย์ณรงค์ศักดิ์ วิชโรทน)  
ประธานคณะกรรมการจริยธรรมการวิจัยในคน

๓ ๕ ๓๐ ๒๕๖๒  
.....  
วันที่

.....  
(นายแพทย์อนันต์ กมลนตร)  
ผู้อำนวยการโรงพยาบาลสระบุรี

๐ ๕ ๓๐. ๒๕๖๒  
.....  
วันที่



กรมการแพทย์  
โรงพยาบาลมะเร็งลพบุรี

หนังสือฉบับนี้ให้ไว้เพื่อแสดงว่า

โครงการวิจัยเรื่อง : การพัฒนาเครื่องมือแบบประเมินความต้องการการดูแลสนับสนุนของหญิงไทยที่เป็นมะเร็งเต้านมขณะรับการรักษาเคมีบำบัด

รหัสโครงการ : LEC 6201

ผู้วิจัย : นางสาวสุภาณี คลิ่งฤทธิ์

หน่วยงานที่สังกัด : คณะพยาบาลศาสตร์จุฬาลงกรณ์มหาวิทยาลัย

เอกสารที่พิจารณาพบทวน

1. แบบเสนอเพื่อขอรับการพิจารณาจริยธรรมการวิจัยในมนุษย์ ตามที่คณะกรรมการจริยธรรมการวิจัยในมนุษย์กำหนด จำนวน 1 ชุด
2. โครงการวิจัยแบบ ว-1ด พร้อมประวัติความรู้ความชำนาญของผู้วิจัย จำนวน 1 ชุด
3. แบบฟอร์มนำส่งค่าธรรมเนียมและหลักฐานการชำระเงิน จำนวน 1 ชุด
4. เอกสารชี้แจงผู้เข้าร่วมวิจัย หนังสือแสดงความยินยอมการเข้าร่วมโครงการวิจัย
5. เครื่องมือการวิจัย หรือแบบสอบถามการวิจัย
6. เอกสารอนุมัติหัวข้อคู่มือ
7. เอกสารรับรองโครงการวิจัยที่ผ่านการพิจารณาจริยธรรม (โรงพยาบาลมะเร็งลำปาง)
8. แผ่นบรรจุข้อมูลโครงการวิจัยทั้งหมด

ได้ผ่านการรับรองจาก คณะกรรมการวิจัยและพิจารณาจริยธรรมการวิจัยในมนุษย์ โรงพยาบาลมะเร็งลพบุรี โดยยึดหลักเกณฑ์ตามประกาศเฮลซิงกิ (Declaration of Helsinki) และแนวทางปฏิบัติกรวิจัยทางคลินิกที่ดี (ICH GCP) โดยขอให้รายงานความก้าวหน้าของโครงการวิจัย ทุก 6 เดือน

ลงนาม

( พ.ญ.สุรัฐญา ศิริอาชากุล )

ประธานคณะกรรมการวิจัยและพิจารณาจริยธรรมโรงพยาบาลมะเร็งลพบุรี

วันที่ 22 เดือนตุลาคม พ.ศ. 2561

หมายเลขรับรอง : LEC 6201  
วันที่ให้การรับรอง : วันที่ 16 เดือนตุลาคม 2561  
วันหมดอายุใบรับรอง : วันที่ 15 เดือนตุลาคม 2562

โรงพยาบาลมะเร็งลพบุรี

11 / 1 ถนนพหลโยธิน ต.ทะเลชุบศร อ.เมือง จ.ลพบุรี 15000 โทร. (036) 621800 ต่อ 7523 , โทรสาร (036) 421679



Certificate of Approval  
From  
Ethics Committee of Chonburi Cancer Hospital  
No. 14/2018

|                        |   |
|------------------------|---|
| Protocol               | THE DEVELOPMENT OF SUPPORTIVE CARE NEEDS SCAL<br>FOR THAI WOMEN WITH BREAST CANCER UNDERGOING<br>CHEMOTHERAPY |
| Protocol Number        | No. 14/2018   |
| Principal Investigator | Miss Supanee Klungrit   |
| Affiliation            | Faculty of Nursing, Chulalongkorn University  |
| Research Site          | Chonburi Cancer Hospital, Chonburi, Thailand  |
| Document Approved      | - Research Project<br>- Consent form<br>- Research Subject Information Sheet<br>- Questionnaire               |
| Date of Approval       | September 14, 2018  |
| Date of Expiration     | June 30, 2019   |

The prior mentioned document have been reviewed and approved by Ethics Committee of Chonburi Cancer Hospital, Chonburi, Thailand, based on the Declaration of Helsinki and Good Clinical Practice.

Signature..... Orapin Chokchaitam.....  
(Orapin Chokchaitam, D.S)  
Chairman, Ethics Committee  
Chonburi Cancer Hospital



ที่ สธ ๐๓๑๒.๖/ ๑๙๙๙

โรงพยาบาลมะเร็งสุราษฎร์ธานี  
๔๓๑ หมู่ ๕ ต.ขุนทะเล อ.เมือง  
จ. สุราษฎร์ธานี ๘๔๑๐๐

๑๘ ตุลาคม ๒๕๖๑

เรื่อง อนุมัติให้ดำเนินการศึกษาการวิจัยได้

เรียน นางสาวสุภาณี คลังฤทธิ์

ตามที่ ท่านได้เสนอโครงการวิจัยเรื่อง “การพัฒนาเครื่องมือแบบประเมินความต้องการการดูแลสนับสนุนของหญิงไทยที่เป็นมะเร็งเต้านมขณะรับการรักษาเคมีบำบัด” ต่อคณะกรรมการวิจัยและประเมินเทคโนโลยีทางการแพทย์ โรงพยาบาลมะเร็งสุราษฎร์ธานี เพื่อขอเข้าเก็บรวบรวมข้อมูลงานวิจัยในโรงพยาบาล ซึ่งคณะกรรมการฯ ได้มีการพิจารณาแล้วเสร็จ เมื่อวันที่ ๑๒ ตุลาคม ๒๕๖๑ นั้น

ในการนี้ คณะกรรมการวิจัยและประเมินเทคโนโลยีทางการแพทย์ โรงพยาบาลมะเร็งสุราษฎร์ธานี มีมติอนุมัติให้ดำเนินการวิจัยได้ อนึ่งคณะกรรมการฯ ขอแจ้งเกี่ยวกับความรับผิดชอบของผู้วิจัย ภายหลังได้รับการอนุมัติ คือ ภายหลังเสร็จสิ้นการวิจัยให้ดำเนินการจัดทำรายงานสรุปผลการวิจัย ให้แก่โรงพยาบาลมะเร็งสุราษฎร์ธานี

จึงเรียนมาเพื่อโปรดทราบ

ขอแสดงความนับถือ

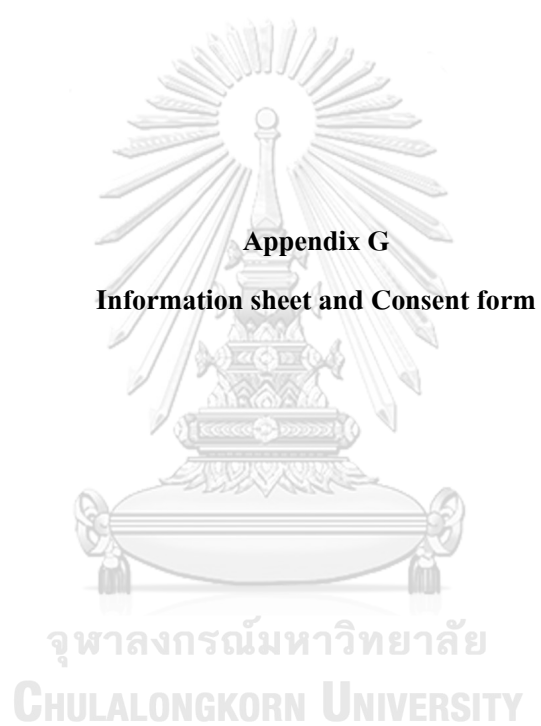
(นายเมธี วงศ์เสนา)

ผู้อำนวยการโรงพยาบาลมะเร็งสุราษฎร์ธานี

คณะกรรมการวิจัยและประเมินเทคโนโลยีทางการแพทย์

โทรศัพท์ ๐๗๗ ๒๗๗ ๕๕๕ ต่อ ๑๒๗๕

โทรสาร ๐๗๗ ๒๗๗ ๕๖๙





## เอกสารชี้แจงข้อมูล/คำแนะนำแก่ผู้เข้าร่วมการวิจัย

### ชื่อโครงการวิจัย

“การพัฒนาเครื่องมือแบบประเมินความต้องการการดูแลสนับสนุนของหญิงไทยที่เป็นมะเร็งเต้านมขณะรับการรักษาเคมีบำบัด”

### ชื่อผู้วิจัย

นางสาวสุภาณี คลังฤทธิ

นิสิตชั้นปริญญาโทบัณฑิต คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

### ที่อยู่สำหรับติดต่อ

คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย อาคารบรมราชชนนีศรีศตพรรษ ชั้น 11

ถนนพระราม 1 แขวงวังใหม่ เขตปทุมวัน กรุงเทพฯ 10330

โทรศัพท์ 0-2218-1131 โทรศัพท์เคลื่อนที่ 08-1888-4043

Email: sklungrit@hotmail.com

ข้าพเจ้า นางสาวสุภาณี คลังฤทธิ นิสิตชั้นปริญญาโทบัณฑิต คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย มีความประสงค์ที่จะขอความร่วมมือจากท่าน เพื่อให้เป็นผู้มีส่วนร่วมในการวิจัย เรื่อง “การพัฒนาเครื่องมือแบบประเมินความต้องการการดูแลสนับสนุนของหญิงไทยที่เป็นมะเร็งเต้านมขณะ รับการรักษาเคมีบำบัด” โดยรายละเอียดเกี่ยวกับการวิจัยมีดังนี้

1. การศึกษาวิจัยนี้ มีวัตถุประสงค์การวิจัยเพื่อพัฒนาและทดสอบคุณสมบัติการวัดทางจิตวิทยาของเครื่องมือแบบประเมินความต้องการการดูแลสนับสนุนของหญิงไทยที่เป็นมะเร็งเต้านมขณะรับการรักษาเคมีบำบัด โดยผู้วิจัยเป็นผู้สร้างและพัฒนาแบบสอบถามในการประเมินความต้องการการดูแลสนับสนุนเพื่อศึกษาความต้องการการดูแลสนับสนุนของหญิงไทยที่เป็นมะเร็งเต้านมขณะรับการรักษาเคมีบำบัดว่ามีความต้องการการดูแลสนับสนุนด้านใด และมีความต้องการการดูแลสนับสนุนอยู่ในระดับใด

2. ผู้เข้าร่วมโครงการวิจัยในครั้งนี้ คือ ผู้ป่วยหญิงไทยที่เป็นมะเร็งเต้านมขณะได้รับเคมีบำบัด ณ หน่วยศัลยกรรมขั้นสูงด้านโรคมะเร็งที่ได้รับการส่งมาจากทั่วประเทศ โดยมีเกณฑ์คัดเข้า ดังนี้

1) เป็นผู้ป่วยหญิงไทยที่ได้รับการวินิจฉัยจากแพทย์ว่าเป็นมะเร็งเต้านมในระยะลุกลามทั้ง Invasive breast cancer และ Advanced invasive breast cancer และยังไม่มีการลุกลามไปที่อวัยวะอื่น

- 2) มีอายุตั้งแต่ 20 ปีขึ้นไป
- 3) อยู่ระหว่างการรับการรักษาด้วยเคมีบำบัดเพียงอย่างเดียว
- 4) มีสติสัมปชัญญะสมบูรณ์ สามารถสื่อสารภาษาไทยได้ และยินดีให้ความร่วมมือ

#### ในการวิจัย

3. การให้ข้อมูลแก่กลุ่มประชากร หรือผู้มีส่วนร่วมในการวิจัย จะทำโดยผู้วิจัย หรือผู้ร่วมวิจัย

4. ผู้เข้าร่วมวิจัยจะได้รับการชี้แจงจากผู้วิจัยถึงวัตถุประสงค์ ขั้นตอนการเก็บข้อมูล หลังจากนั้นผู้ร่วมวิจัยจะได้รับการตอบแบบสอบถามจำนวน 1 ชุด ซึ่งประกอบด้วย แบบสอบถามข้อมูลทั่วไป และแบบสอบถามความต้องการการดูแลสนับสนุน (ฉบับที่พัฒนาขึ้นใหม่) ซึ่งใช้เวลาทั้งหมดประมาณ 15 นาที

5. การศึกษาครั้งนี้เป็นการตอบแบบสอบถามเกี่ยวกับความต้องการการดูแลสนับสนุนด้วยความสมัครใจ ซึ่งไม่มีผลข้างเคียงที่กระทบต่อด้านร่างกาย แต่อาจมีบางคำถามที่กระทบความรู้สึกของผู้เข้าร่วมวิจัยได้ ดังนั้นผู้เข้าร่วมวิจัยจึงมีสิทธิที่จะปฏิเสธการตอบแบบสอบถาม หรือถอนตัวออกจากกรวิจัยครั้งนี้ได้ตลอดเวลาที่ต้องการ ทั้งนี้การปฏิเสธจะไม่ก่อให้เกิดอันตราย หรือผลกระทบใดๆ ต่อผู้เข้าร่วมวิจัย

6. ข้อมูลที่ได้จากการตอบแบบสอบถามของผู้เข้าร่วมวิจัยจะถูกนำไปรวมกับข้อมูลของผู้เข้าร่วมวิจัยคนอื่น ๆ ที่เข้าร่วมในการศึกษาครั้งนี้ โดยข้อมูลจะถูกเก็บเป็นความลับและผู้วิจัยจะใช้รหัสแทนที่ชื่อและนามสกุลของผู้เข้าร่วมวิจัยในแบบบันทึกข้อมูล หากผู้วิจัยตีพิมพ์ผลการศึกษารายงานผลการวิจัยจะเป็นข้อมูลส่วนรวม การเปิดเผยข้อมูลเกี่ยวกับผู้ป่วยต่อหน่วยงานต่างๆ ที่เกี่ยวข้อง กระทำได้เฉพาะกรณีจำเป็นด้วยเหตุผลทางวิชาการเท่านั้น และผู้วิจัยจะทำการทำลายแบบสอบถามเหล่านั้นด้วยตนเองภายหลังเสร็จสิ้นการวิจัย

7. ประโยชน์ที่ได้จากงานวิจัยในครั้งนี้จะช่วยให้พยาบาลวิชาชีพ ตลอดจนวิชาชีพทางสุขภาพที่มีส่วนเกี่ยวข้องในการดูแลผู้ป่วยมะเร็งเต้านม สามารถประเมินความต้องการการดูแลสนับสนุนของหญิงไทยที่เป็นมะเร็งเต้านมขณะรับการรักษาเคมีบำบัด ซึ่งผลการศึกษาจะช่วยให้เกิดความเข้าใจถึงความต้องการการดูแลสนับสนุนของผู้ป่วยเหล่านั้นอย่างแท้จริง สามารถนำไปพัฒนากระบวนการดูแลผู้ป่วยมะเร็งเต้านมขณะได้รับเคมีบำบัด ได้ตรงกับความต้องการของผู้ป่วย ทั้งนี้จะส่งผลให้การพยาบาลที่ยึดผู้ป่วยเป็นศูนย์กลางมีประสิทธิภาพมากยิ่งขึ้น

8. หากผู้เข้าร่วมวิจัยมีข้อสงสัยสามารถสอบถามเพิ่มเติมจากผู้วิจัยโดยสามารถสอบถามได้โดยตรง หรือติดต่อผู้วิจัยได้ตลอดเวลาที่ นางสาวสุภาณี คลังฤทธิ์ ทางโทรศัพท์ 08-1888-4043 หรือตามที่อยู่ด้านบน

9. โครงการวิจัยครั้งนี้ ไม่มีการจ่ายค่าชดเชยการเสียเวลาให้ผู้เข้าร่วมการวิจัย แต่ผู้เข้าร่วมการวิจัยจะได้รับของที่ระลึกจากการเข้าร่วมวิจัยครั้งนี้

10. “หากท่านไม่ได้รับการปฏิบัติตามข้อมูลดังกล่าวสามารถร้องเรียนได้ที่

คณะกรรมการพิจารณาจริยธรรมการวิจัยในคน โรงพยาบาลมะเร็งลำปาง 199 หมู่ 12 ต.พิชัย อ.เมือง จ.ลำปาง 52000 โทรศัพท์ 0-5433-5262-8 โทรสาร 0-5433-5273”



## หนังสือแสดงความยินยอมเข้าร่วมการวิจัย

ทำที่.....

วันที่.....เดือน.....พ.ศ. 2561

เลขที่ ประชากรตัวอย่าง หรือผู้เข้าร่วมการวิจัย .....

ข้าพเจ้า ซึ่งได้ลงนามท้ายหนังสือนี้ ขอแสดงความยินยอมเข้าร่วมโครงการวิจัย

ชื่อโครงการวิจัย “การพัฒนาเครื่องมือแบบประเมินความต้องการการดูแลสนับสนุนของหญิงไทย  
ที่เป็นมะเร็งเต้านมขณะรับการรักษาเคมีบำบัด”

ชื่อผู้วิจัย นางสาวสุภาณี คลังฤทธิ  
นิสิตชั้นปริญญาโท ภาควิชาคณิตศาสตร์ คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

สถานที่ติดต่อ คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย โทรศัพท์ 08-1888-4043

ข้าพเจ้าได้ลงนามด้านล่างของหนังสือเล่มนี้ และได้รับคำอธิบายอย่างชัดเจนจนเป็นที่เข้าใจ  
อย่างดีจากผู้วิจัยชื่อ นางสาวสุภาณี คลังฤทธิ นิสิตชั้นปริญญาโท ภาควิชาคณิตศาสตร์  
จุฬาลงกรณ์มหาวิทยาลัย ถึงวัตถุประสงค์และขั้นตอนการวิจัย ความเสี่ยงและประโยชน์ซึ่งจะ  
เกิดขึ้นจากการวิจัยเรื่อง “การพัฒนาเครื่องมือแบบประเมินความต้องการการดูแลสนับสนุนของ  
หญิงไทยที่เป็นมะเร็งเต้านมขณะรับการรักษาเคมีบำบัด” ดังนี้

ข้าพเจ้าจึงสมัครใจเข้าร่วมโครงการวิจัยในครั้งนี้ ตามที่ระบุไว้ในเอกสารชี้แจงข้อมูล/  
คำแนะนำแก่ผู้เข้าร่วมการวิจัย โดยข้าพเจ้ายินยอมเข้าร่วมกิจกรรม คือ การตอบแบบสอบถาม  
เกี่ยวกับข้อมูลทั่วไป และความต้องการการดูแลสนับสนุนของหญิงไทยที่เป็นมะเร็งเต้านมขณะรับ  
การรักษาเคมีบำบัด ที่ผู้วิจัยแจกให้ตามความเป็นจริง

ข้าพเจ้ามีสิทธิ์ที่จะถอนตัวออกจากการวิจัยนี้เมื่อใดก็ได้ตามความประสงค์โดยไม่ต้องแจ้ง  
เหตุผล ซึ่งการถอนตัวออกจากการวิจัยในครั้งนี้จะไม่มีผลกระทบใดๆ ต่อข้าพเจ้าทั้งสิ้น

ข้าพเจ้าได้รับคำรับรองว่า ผู้วิจัยจะปฏิบัติต่อข้าพเจ้าตามข้อมูลที่ระบุไว้ในเอกสารชี้แจง  
ข้อมูล/คำแนะนำแก่ผู้เข้าร่วมการวิจัย และข้อมูลใดๆที่เกี่ยวข้องกับข้าพเจ้า ผู้วิจัยจะเก็บรักษาเป็น  
ความลับ โดยจะนำเสนอผลการวิจัยเป็นข้อมูลภาพรวมเท่านั้น

หากข้าพเจ้าไม่ได้รับการปฏิบัติตรงตามที่ระบุไว้ในเอกสารชี้แจงข้อมูล/คำแนะนำแก่ผู้เข้าร่วมการวิจัย ข้าพเจ้าสามารถร้องเรียนได้ที่ คณะกรรมการพิจารณาจริยธรรมการวิจัยในคน โรงพยาบาลมะเร็งลำปาง 199 หมู่ 12 ต.พิชัย อ.เมือง จ.ลำปาง 52000 โทรศัพท์ 0-5433-5262-8 โทรสาร 0-5433-5273”

ข้าพเจ้ายินดีเข้าร่วมการวิจัยครั้งนี้ และได้ลงลายมือชื่อไว้เป็นสำคัญต่อหน้าพยาน โดยข้าพเจ้าได้รับสำเนาเอกสารชี้แจงข้อมูล/คำแนะนำแก่ผู้เข้าร่วมการวิจัย และหนังสือแสดงความยินยอมเข้าร่วมการวิจัยไว้เรียบร้อยแล้ว

ลงชื่อ..... ลงชื่อ.....  
(ผู้เข้าร่วมวิจัย) (พยาน)

วันที่..... วันที่.....

คำอธิบายของผู้วิจัย/ผู้ร่วมวิจัย

ข้าพเจ้าได้อธิบายรายละเอียดของ โครงการ ตลอดจนประโยชน์ของการวิจัย รวมทั้งข้อเสียที่อาจจะเกิดขึ้นแก่ผู้เข้าร่วมการวิจัยทราบแล้วอย่างชัดเจน โดยไม่มีสิ่งใดปิดบังซ่อนเร้น

ลงชื่อ.....

(ผู้วิจัย/ผู้ร่วมวิจัย)

วันที่.....



**Appendix H**

**SCNS-TBC (Final version) – 43 items**

จุฬาลงกรณ์มหาวิทยาลัย  
**CHULALONGKORN UNIVERSITY**

**แบบสอบถามการวิจัยเรื่อง**  
**การพัฒนาเครื่องมือแบบประเมินความต้องการการดูแลสนับสนุน**  
**ของหญิงไทยที่เป็นมะเร็งเต้านมขณะรับการรักษาเคมีบำบัด**

**ตอนที่ 1** แบบประเมินความต้องการการดูแลสนับสนุนของหญิงไทยที่เป็นมะเร็งเต้านมขณะรับการรักษาเคมีบำบัด จำนวน 43 ข้อ

**คำชี้แจง** ข้อคำถามต่อไปนี้ต้องการถามข้อมูลเกี่ยวกับความต้องการการดูแลสนับสนุนของหญิงไทยที่เป็นมะเร็งเต้านมขณะรับการรักษาด้วยเคมีบำบัด กรุณาอ่านข้อคำถามทีละข้อ และพิจารณาว่าข้อคำถามข้อนั้นบ่งบอกถึงสภาพปัญหา หรือแนวทางการแก้ไขปัญหานั้นที่สำคัญและจำเป็นสำหรับคุณในระดับใด และวงกลม ○ ส้อมรอบหมายเลข 1 - 4 ที่ตรงกับความเป็นจริงของคุณมากที่สุด

- 1 หมายถึง สภาพปัญหา หรือแนวทางการแก้ไขปัญหานั้นมีสำคัญและจำเป็นสำหรับคุณ **ในระดับน้อยที่สุด**
- 2 หมายถึง สภาพปัญหา หรือแนวทางการแก้ไขปัญหานั้นมีสำคัญและจำเป็นสำหรับคุณ **ในระดับเล็กน้อย**
- 3 หมายถึง สภาพปัญหา หรือแนวทางการแก้ไขปัญหานั้นมีสำคัญและจำเป็นสำหรับคุณ **ในระดับมาก**
- 4 หมายถึง สภาพปัญหา หรือแนวทางการแก้ไขปัญหานั้นมีสำคัญและจำเป็นสำหรับคุณ **ในระดับมากที่สุด**

**ตัวอย่าง**

| ในช่วงเวลาของการรับการรักษาด้วยเคมีบำบัด...<br>สภาพปัญหา หรือแนวทางการแก้ไขปัญหานี้.....<br>มีสำคัญและจำเป็นสำหรับคุณในระดับใด? | ระดับความสำคัญและจำเป็น |          |          |           |
|---|-------------------------|----------|----------|-----------|
|   | น้อยที่สุด              | เล็กน้อย | มาก      | มากที่สุด |
| 29. ฉันต้องการคำแนะนำเกี่ยวกับฤทธิ์ข้างเคียงของยาเคมีบำบัดที่มีผลต่อร่างกาย   | <b>1</b>                | <b>2</b> | <b>3</b> | <b>4</b>  |

จากตัวอย่าง ถ้าคุณเลือกวงกลมคำตอบเลข 3 แสดงว่าข้อมูลเกี่ยวกับฤทธิ์ข้างเคียงของยาเคมีบำบัดที่มีผลต่อร่างกายเป็นข้อมูลที่สำคัญและจำเป็นที่คุณต้องการได้รับคำแนะนำใน**ระดับมาก**

โรงพยาบาล.....

กรุณาตอบข้อคำถามทุกข้อ ดังนี้

| ความต้องการการดูแลสนับสนุนขณะรับการรักษาเคมีบำบัด   |                         |          |     |           |
|---|-------------------------|----------|-----|-----------|
| ในช่วงเวลาของการรับการรักษาด้วยเคมีบำบัด...<br>สภาพปัญหา หรือแนวทางการแก้ไขปัญหาเหล่านี้.....<br>มีสำคัญและจำเป็นสำหรับคุณในระดับใด?                            | ระดับความสำคัญและจำเป็น |          |     |           |
|   | น้อยที่สุด              | เล็กน้อย | มาก | มากที่สุด |
| <b>การสนับสนุนทางการเงิน (จำนวน 6 ข้อ)</b>  |                         |          |     |           |
| 1. ฉันต้องการได้รับสวัสดิการจากรัฐบาลในการสนับสนุนเรื่องค่าใช้จ่ายอื่นๆ ในการมารับยาเคมีบำบัดที่โรงพยาบาล เช่น ค่ารถ ค่าน้ำมัน ค่าเดินทาง ค่าที่พัก และค่าอาหาร | 1                       | 2        | 3   | 4         |
| 2. ฉันต้องการการสนับสนุนเรื่องอาชีพ/การทำงานเพื่อให้มีรายได้ทดแทนงานเดิมที่ไม่สามารถทำได้ในช่วงนี้  | 1                       | 2        | 3   | 4         |
| 3. ฉันต้องการความช่วยเหลือจากครอบครัว และญาติเรื่องเงินสำรองในกรณีที่เป็น   | 1                       | 2        | 3   | 4         |
| 4. ฉันต้องการได้รับการสนับสนุนจากโรงพยาบาลเรื่องอาหารเสริมที่ไม่สามารถซื้อรับประทานเองได้   | 1                       | 2        | 3   | 4         |
| 5. ฉันต้องการได้รับการสนับสนุนวิกรม หมวก ผ้าโพกศีรษะจากโรงพยาบาล  | 1                       | 2        | 3   | 4         |
| 6. ฉันต้องการทราบรายละเอียดค่าใช้จ่ายในการรักษา และแนวทางการใช้สิทธิการรักษาโดยไม่เสียค่าใช้จ่าย  | 1                       | 2        | 3   | 4         |
| <b>คำแนะนำการดูแลตนเอง (จำนวน 5 ข้อ)</b>  |                         |          |     |           |
| 7. ฉันต้องการคำแนะนำเกี่ยวกับชนิดของอาหารที่ควรรับประทาน และอาหารที่ควรหลีกเลี่ยง   | 1                       | 2        | 3   | 4         |
| 8. ฉันต้องการคำแนะนำเกี่ยวกับข้อปฏิบัติในการใช้แขนข้างที่เป็นมะเร็งด้านมในการทำกิจกรรมต่างๆ   | 1                       | 2        | 3   | 4         |
| 9. ฉันต้องการข้อมูลเกี่ยวกับกิจกรรมต่างๆ และงานที่สามารถทำได้ในช่วงที่เจ็บป่วยและรักษาด้วยยาเคมีบำบัด   | 1                       | 2        | 3   | 4         |
| 10. ฉันต้องการคำแนะนำเรื่องการปฏิบัติตัวที่ส่งเสริมให้ผลตรวจเลือดมีค่าปกติและสามารถรับยาเคมีบำบัดได้อย่างต่อเนื่อง  | 1                       | 2        | 3   | 4         |
| 11. ฉันต้องการพูดคุยเพื่อแลกเปลี่ยนประสบการณ์ของ  | 1                       | 2        | 3   | 4         |



| ความต้องการการดูแลสนับสนุนขณะรับการรักษาเคมีบำบัด  |                         |          |     |           |
|--|-------------------------|----------|-----|-----------|
| ในช่วงเวลาของการรับการรักษาด้วยเคมีบำบัด...<br>สภาพปัญหา หรือแนวทางการแก้ไขปัญหาเหล่านี้.....<br>มีความสำคัญและจำเป็นสำหรับคุณในระดับใด? | ระดับความสำคัญและจำเป็น |          |     |           |
|  | น้อยที่สุด              | เล็กน้อย | มาก | มากที่สุด |
| ตัวเองกับคนที่ป่วยและอยู่ในภาวะเดียวกัน  |                         |          |     |           |
| <b>การสนับสนุนจากครอบครัว (จำนวน 7 ข้อ)</b>  |                         |          |     |           |
| 12. ฉันต้องการให้คนในครอบครัวยอมรับกับสภาพร่างกายของฉันที่เปลี่ยนแปลงจากความเจ็บป่วยและการรักษาโดยไม่แสดงท่าทีรังเกียจ                   | 1                       | 2        | 3   | 4         |
| 13. ฉันต้องการให้คนในครอบครัวทำงานบ้านแทนในช่วงเวลาที่ฉันอ่อนเพลียมาก  | 1                       | 2        | 3   | 4         |
| 14. ฉันต้องการให้ครอบครัวจัดเตรียมอาหารที่ฉันสามารถรับประทานได้ในเวลาที่ฉันรู้สึกเบื่ออาหาร  | 1                       | 2        | 3   | 4         |
| 15. ฉันต้องการให้ครอบครัวพาไปทำบุญ ทำทาน สร้างกุศลให้มีกำลังใจมากขึ้น  | 1                       | 2        | 3   | 4         |
| 16. ฉันยังทำใจยอมรับการเจ็บป่วยและการรักษาไม่ได้ และต้องการกำลังใจจากครอบครัว  | 1                       | 2        | 3   | 4         |
| 17. ฉันมีอาการนอนไม่หลับ และต้องการได้รับความช่วยเหลือ   | 1                       | 2        | 3   | 4         |
| 18. ฉันต้องการให้พยาบาลที่โรงพยาบาลกลับบ้านมาเยี่ยมที่บ้านในช่วง 2-3 วันหลังกลับจากรับยาเคมีบำบัดแต่ละครั้ง                              | 1                       | 2        | 3   | 4         |
| <b>การตระหนักเกี่ยวกับโรคและการรักษา (จำนวน 7 ข้อ)</b>   |                         |          |     |           |
| 19. ฉันต้องการให้แพทย์บอกความก้าวหน้าของโรคและการรักษาของฉันเป็นระยะๆ  | 1                       | 2        | 3   | 4         |
| 20. ฉันต้องการทราบข้อมูลเกี่ยวกับแนวทางการรักษาและระยะเวลาในการรักษาจนกว่าจะหายขาด   | 1                       | 2        | 3   | 4         |
| 21. ฉันต้องการพยาบาลที่มีความเชี่ยวชาญในการแทงเส้นเลือดสำหรับให้ยาเคมีบำบัด  | 1                       | 2        | 3   | 4         |
| 22. ฉันต้องการให้แพทย์ พยาบาลพูดคุยกับฉันด้วยถ้อยคำสุภาพ ไม่ตำหนิให้รู้สึกไม่สบายใจ  | 1                       | 2        | 3   | 4         |
| 23. ฉันต้องการได้รับการนัดตรวจกับแพทย์ และการตรวจอื่นๆ เช่น ตรวจเลือด เอกซเรย์ และรับยาเคมีบำบัด   | 1                       | 2        | 3   | 4         |

| ความต้องการการดูแลสนับสนุนขณะรับการรักษาเคมีบำบัด  |                         |          |     |           |
|--|-------------------------|----------|-----|-----------|
| ในช่วงเวลาของการรับการรักษาด้วยเคมีบำบัด...<br>สภาพปัญหา หรือแนวทางการแก้ไขปัญหาเหล่านี้.....<br>มีสำคัญและจำเป็นสำหรับคุณในระดับใด? | ระดับความสำคัญและจำเป็น |          |     |           |
|  | น้อยที่สุด              | เล็กน้อย | มาก | มากที่สุด |
| ในวันเดียวกัน  |                         |          |     |           |
| 24. ฉันต้องการคำแนะนำเกี่ยวกับฤทธิ์ข้างเคียงของยาเคมีบำบัดที่มีผลต่อร่างกาย  | 1                       | 2        | 3   | 4         |
| 25. ฉันต้องการคำอธิบายจากแพทย์เกี่ยวกับลักษณะ/ชนิด/ระยะและความรุนแรงของโรคมะเร็งเต้านมที่ฉันกำลังเป็นอยู่                            | 1                       | 2        | 3   | 4         |
| <b>การมีส่วนร่วมของครอบครัว ( จำนวน 5 ข้อ)</b>   |                         |          |     |           |
| 26. ฉันต้องการให้ครอบครัวคอยเตือนเกี่ยวกับวันนัดในการมาตรวจและมารับยาเคมีบำบัดแต่ละครั้ง   | 1                       | 2        | 3   | 4         |
| 27. ฉันต้องการให้ครอบครัวมีส่วนร่วมในการรับฟังข้อมูลและช่วยตัดสินใจเกี่ยวกับการเจ็บป่วยและการรักษาด้วยเคมีบำบัด                      | 1                       | 2        | 3   | 4         |
| 28. ฉันต้องการให้ครอบครัวมารับ-ส่ง และอยู่ด้วยในขณะที่ฉันมารับยาเคมีบำบัดที่โรงพยาบาล  | 1                       | 2        | 3   | 4         |
| 29. ฉันต้องการให้แพทย์อนุญาตให้ญาติเข้าไปในห้องตรวจขณะพบแพทย์ด้วย  | 1                       | 2        | 3   | 4         |
| 30. ฉันต้องการให้แพทย์ หรือพยาบาลเป็นสื่อกลางในการอธิบายกับคนในครอบครัวเกี่ยวกับสภาพการเจ็บป่วยและการรักษาของฉัน                     | 1                       | 2        | 3   | 4         |
| <b>การปรึกษาผู้เชี่ยวชาญ (จำนวน 4 ข้อ)</b>   |                         |          |     |           |
| 31. ฉันต้องการการบริการให้คำปรึกษาทางโทรศัพท์ 24 ชม. เมื่อเกิดปัญหาหรือข้อสงสัยขณะอยู่ที่บ้าน  | 1                       | 2        | 3   | 4         |
| 32. ฉันต้องการให้มีพยาบาล หรือนักโภชนาการให้ความรู้ หรือตอบข้อซักถามต่างๆขณะรอพบแพทย์  | 1                       | 2        | 3   | 4         |
| 33. ฉันต้องการให้แพทย์/พยาบาลใช้เวลาในการอธิบายและให้คำแนะนำต่างๆ  | 1                       | 2        | 3   | 4         |
| 34. ฉันต้องการคำปรึกษาเป็นรายบุคคลมากกว่าการแนะนำเป็นรายกลุ่ม  | 1                       | 2        | 3   | 4         |
| <b>ข้อมูลการดูแลทางเลือก (จำนวน 3 ข้อ)</b>   |                         |          |     |           |

| ความต้องการการดูแลสนับสนุนขณะรับการรักษาเคมีบำบัด  |                         |          |     |           |
|--|-------------------------|----------|-----|-----------|
| ในช่วงเวลาของการรับการรักษาด้วยเคมีบำบัด...<br>สภาพปัญหา หรือแนวทางการแก้ไขปัญหาลำนี้.....<br>มีสำคัญและจำเป็นสำหรับคุณในระดับใด?                    | ระดับความสำคัญและจำเป็น |          |     |           |
|  | น้อยที่สุด              | เล็กน้อย | มาก | มากที่สุด |
| 35. ฉันต้องการคำชี้แจงเกี่ยวกับการใช้สมุนไพรร่วมกับการรักษาด้วยยาเคมีบำบัด   | 1                       | 2        | 3   | 4         |
| 36. ฉันต้องการข้อมูลเกี่ยวกับทางเลือกอื่นๆในการรักษา นอกจากการรักษาด้วยเคมีบำบัด   | 1                       | 2        | 3   | 4         |
| 37. ฉันต้องการคำแนะนำเรื่องทางเลือก และอาหารทดแทนเฉพาะรายบุคคล เช่น อาหารเสริม หรือ วิตามินต่างๆ   | 1                       | 2        | 3   | 4         |
| <b>การดูแลและบรรเทาอาการ (จำนวน 6 ข้อ)</b>   |                         |          |     |           |
| 38. ฉันต้องการห้าม หมอนหนุนหลัง หรือ ผ้ารองแขนข้างที่แทงเข็มขณะนอนรับยาเคมีบำบัด   | 1                       | 2        | 3   | 4         |
| 39. ฉันต้องการมีคนพาไปห้องน้ำในระหว่างที่เข้ารับยาเคมีบำบัด  | 1                       | 2        | 3   | 4         |
| 40. ฉันต้องการได้รับความช่วยเหลือเกี่ยวกับอาการเจ็บและแสบร้อนบริเวณที่แทงเข็ม  | 1                       | 2        | 3   | 4         |
| 41. ฉันต้องการให้มีบริการลูกอม หรือน้ำสมุนไพรอุ่นๆ เช่น น้ำขิง น้ำใบเตย น้ำตะไคร้ จิบเพื่อบรรเทาอาการขมคอ น้ำลายเหนียว ในระหว่างที่นอนรับยาเคมีบำบัด | 1                       | 2        | 3   | 4         |
| 42. ฉันต้องการการบรรเทาอาการคลื่นไส้ อาเจียน หลังจากได้รับยาเคมีบำบัด  | 1                       | 2        | 3   | 4         |
| 43. ฉันต้องการให้พยาบาลเดินมาซักถามอาการ หรือมาดูแลเป็นระยะๆ ในขณะที่นอนรับยาเคมีบำบัด   | 1                       | 2        | 3   | 4         |

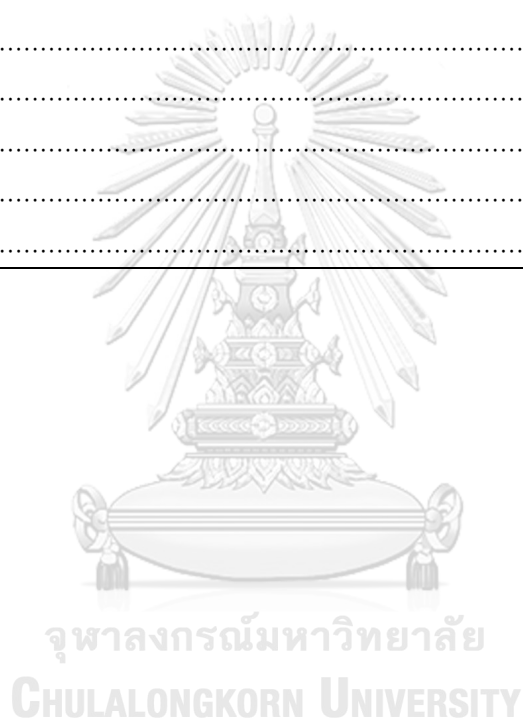
## ตอนที่ 2 แบบบันทึกข้อมูลส่วนบุคคล

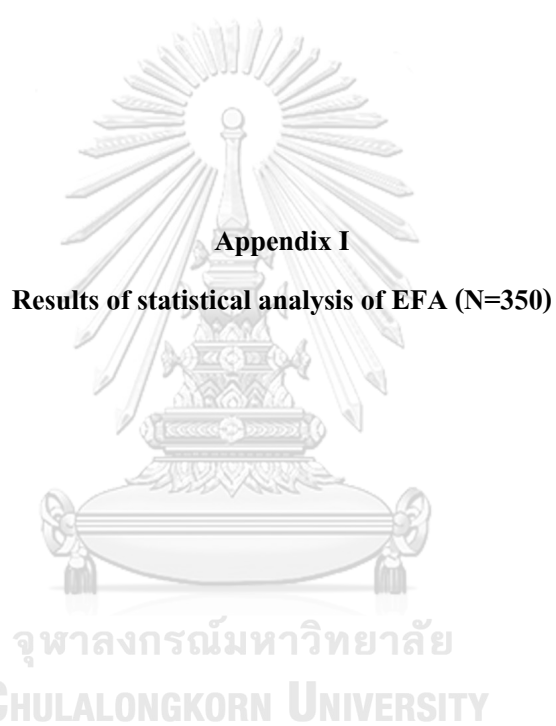
**คำชี้แจง** กรุณาเติมคำลงในช่องว่าง และใส่เครื่องหมาย (✓) หน้าข้อความที่เป็นจริงมากที่สุด โดยแต่ละข้อให้เลือกตอบเพียงคำตอบเดียว และโปรดตอบคำถามทุกข้อ

1. อายุ .....ปี
2. สถานภาพ  โสด  คู่  หม้าย  หย่า/แยก
3. ศาสนา  พุทธ  คริสต์  อิสลาม  อื่นๆ
- ระบุ.....
4. ระดับการศึกษาสูงสุด  ไม่ได้เรียน  อนุปริญญา หรือ ปวส.  
 ประถมศึกษา  ปริญญาตรี  
 มัธยมศึกษาตอนต้น  สูงกว่าปริญญาตรี  
 มัธยมศึกษาตอนปลาย หรือ ปวช.
5. อาชีพ  ไม่ได้ประกอบอาชีพ  ค้าขาย  รับจ้าง  
 ทั่วไป  ธุรกิจส่วนตัว  พนักงานบริษัทเอกชน  
 พนักงานรัฐวิสาหกิจ  ข้าราชการ  เกษตรกรรม  
 อื่นๆ โปรดระบุ.....
6. รายได้ต่อเดือน .....บาท
7. ภูมิลำเนา จังหวัด.....
8. การวินิจฉัยโรค  มะเร็งเต้านมข้างซ้าย  มะเร็งเต้านมข้างขวา
9. การผ่าตัด  ได้รับการผ่าตัดเต้านมออกแล้ว  ยังไม่ได้รับการผ่าตัดเต้านม
10. การรับยาเคมีบำบัด  ครั้งแรก.....  
 ครั้งที่ 1  ครั้งที่ 2  ครั้งที่ 3  ครั้งที่ 4  
 ครั้งที่ 5  ครั้งที่ 6  ครั้งที่ 7  ครั้งที่ 8  
 อื่นๆ ระบุ.....
11. ระยะเวลาที่รับยาเคมีบำบัดมาแล้ว.....เดือน.....วัน
12. สิทธิการรักษา  สวัสดิการข้าราชการ  ประกันสังคม  
 บัตรทอง  อื่นๆ โปรดระบุ.....

\*\*\*ขอขอบคุณที่กรุณาให้ความร่วมมือในการตอบแบบสอบถามครั้งนี้ค่ะ\*\*\*

|                           |       | สำหรับผู้วิจัย |
|---------------------------|-------|----------------|
| 1. HN                     | ..... |                |
| 2. เบอร์โทรศัพท์          | ..... |                |
| 3. การวินิจฉัยโรค         | ..... |                |
| 4. ระยะของโรคมะเร็งเต้านม | ..... |                |
| 5. สูตรยาเคมีบำบัด        | ..... |                |
|                           | ..... |                |
|                           | ..... |                |
|                           | ..... |                |
|                           | ..... |                |
|                           | ..... |                |





## 1. Descriptive statistic (55 items)

| Descriptive Statistics |           |           |           |           |                |           |           |            |           |            |
|------------------------|-----------|-----------|-----------|-----------|----------------|-----------|-----------|------------|-----------|------------|
|                        | N         | Minimum   | Maximum   | Mean      | Std. Deviation | Variance  | Skewness  |            | Kurtosis  |            |
|                        | Statistic | Statistic | Statistic | Statistic | Statistic      | Statistic | Statistic | Std. Error | Statistic | Std. Error |
| Item1                  | 350       | 1         | 4         | 3.51      | .667           | .446      | -1.300    | .130       | 1.599     | .260       |
| Item2                  | 350       | 1         | 4         | 3.05      | .865           | .749      | -.489     | .130       | -.640     | .260       |
| Item3                  | 350       | 1         | 4         | 2.86      | .956           | .914      | -.463     | .130       | -.712     | .260       |
| Item4                  | 350       | 1         | 4         | 2.53      | 1.078          | 1.161     | .057      | .130       | -1.270    | .260       |
| Item5                  | 350       | 1         | 4         | 2.78      | 1.014          | 1.028     | -.405     | .130       | -.923     | .260       |
| Item6                  | 350       | 1         | 4         | 2.98      | .843           | .710      | -.332     | .130       | -.731     | .260       |
| Item7                  | 350       | 1         | 4         | 2.90      | 1.116          | 1.244     | -.481     | .130       | -1.190    | .260       |
| Item8                  | 350       | 1         | 4         | 2.75      | 1.018          | 1.037     | -.348     | .130       | -.984     | .260       |
| Item9                  | 350       | 1         | 4         | 3.40      | .822           | .676      | -1.262    | .130       | .813      | .260       |
| Item10                 | 350       | 1         | 4         | 2.94      | 1.000          | 1.000     | -.577     | .130       | -.758     | .260       |
| Item11                 | 350       | 1         | 4         | 3.11      | .922           | .850      | -.841     | .130       | -.134     | .260       |
| Item12                 | 350       | 1         | 4         | 3.29      | .865           | .749      | -1.148    | .130       | .646      | .260       |
| Item13                 | 350       | 1         | 4         | 2.97      | 1.017          | 1.034     | -.524     | .130       | -.953     | .260       |
| Item14                 | 350       | 1         | 4         | 3.21      | .901           | .811      | -.985     | .130       | .157      | .260       |
| Item15                 | 350       | 1         | 4         | 3.06      | .946           | .896      | -.656     | .130       | -.602     | .260       |
| Item16                 | 350       | 1         | 4         | 3.40      | .876           | .768      | -1.439    | .130       | 1.222     | .260       |
| Item17                 | 350       | 1         | 4         | 3.59      | .766           | .586      | -2.121    | .130       | 4.104     | .260       |
| Item18                 | 350       | 1         | 4         | 3.22      | 1.028          | 1.056     | -1.063    | .130       | -.183     | .260       |
| Item19                 | 350       | 1         | 4         | 3.47      | .709           | .502      | -1.211    | .130       | .952      | .260       |
| Item20                 | 350       | 1         | 4         | 3.23      | .894           | .799      | -.914     | .130       | -.133     | .260       |
| Item21                 | 350       | 1         | 4         | 3.24      | .823           | .677      | -1.035    | .130       | .677      | .260       |
| Item22                 | 350       | 1         | 4         | 3.12      | .909           | .826      | -.694     | .130       | -.487     | .260       |
| Item23                 | 350       | 1         | 4         | 3.66      | .574           | .329      | -1.553    | .130       | 1.889     | .260       |
| Item24                 | 350       | 1         | 4         | 3.69      | .557           | .310      | -1.762    | .130       | 2.666     | .260       |
| Item25                 | 350       | 1         | 4         | 3.48      | .774           | .600      | -1.543    | .130       | 1.962     | .260       |
| Item26                 | 350       | 1         | 4         | 3.61      | .544           | .296      | -1.084    | .130       | .790      | .260       |
| Item27                 | 350       | 1         | 4         | 3.25      | .845           | .715      | -.841     | .130       | -.191     | .260       |
| Item28                 | 350       | 1         | 4         | 3.00      | 1.043          | 1.089     | -.639     | .130       | -.852     | .260       |
| Item29                 | 350       | 1         | 4         | 3.54      | .640           | .409      | -1.350    | .130       | 1.799     | .260       |
| Item30                 | 350       | 1         | 4         | 3.41      | .759           | .576      | -1.330    | .130       | 1.564     | .260       |
| Item31                 | 350       | 1         | 4         | 3.55      | .665           | .443      | -1.433    | .130       | 1.690     | .260       |
| Item32                 | 350       | 1         | 4         | 3.74      | .496           | .246      | -1.985    | .130       | 4.903     | .260       |
| Item33                 | 350       | 1         | 4         | 3.51      | .663           | .440      | -1.355    | .130       | 2.007     | .260       |
| Item34                 | 350       | 1         | 4         | 3.55      | .630           | .397      | -1.301    | .130       | 1.502     | .260       |
| Item35                 | 350       | 1         | 4         | 3.72      | .542           | .294      | -1.921    | .130       | 3.344     | .260       |
| Item36                 | 350       | 1         | 4         | 3.32      | .837           | .701      | -1.079    | .130       | .394      | .260       |
| Item37                 | 350       | 1         | 4         | 3.25      | .788           | .621      | -.818     | .130       | .106      | .260       |
| Item38                 | 350       | 1         | 4         | 3.10      | .987           | .975      | -.782     | .130       | -.531     | .260       |
| Item39                 | 350       | 1         | 4         | 2.92      | 1.034          | 1.069     | -.440     | .130       | -1.071    | .260       |
| Item40                 | 350       | 1         | 4         | 2.52      | 1.040          | 1.081     | -.007     | .130       | -1.165    | .260       |
| Item41                 | 350       | 1         | 4         | 3.04      | .921           | .849      | -.660     | .130       | -.453     | .260       |
| Item42                 | 350       | 1         | 4         | 3.06      | .964           | .930      | -.570     | .130       | -.873     | .260       |
| Item43                 | 350       | 1         | 4         | 3.14      | .927           | .860      | -.737     | .130       | -.512     | .260       |
| Item44                 | 350       | 1         | 4         | 2.42      | 1.208          | 1.460     | .045      | .130       | -1.559    | .260       |
| Item45                 | 350       | 1         | 4         | 2.60      | .979           | .958      | -.081     | .130       | -.997     | .260       |
| Item46                 | 350       | 1         | 4         | 2.66      | 1.030          | 1.061     | -.222     | .130       | -1.090    | .260       |
| Item47                 | 350       | 1         | 4         | 3.13      | 1.008          | 1.016     | -.879     | .130       | -.405     | .260       |
| Item48                 | 350       | 1         | 4         | 3.22      | .960           | .921      | -1.072    | .130       | .121      | .260       |
| Item49                 | 350       | 1         | 4         | 2.76      | 1.070          | 1.144     | -.236     | .130       | -1.244    | .260       |
| Item50                 | 350       | 1         | 4         | 3.05      | .959           | .920      | -.632     | .130       | -.681     | .260       |
| Item51                 | 350       | 1         | 4         | 2.88      | 1.135          | 1.289     | -.490     | .130       | -1.207    | .260       |
| Item52                 | 350       | 1         | 4         | 3.07      | 1.043          | 1.087     | -.757     | .130       | -.705     | .260       |
| Item53                 | 350       | 1         | 4         | 2.83      | 1.161          | 1.348     | -.452     | .130       | -1.280    | .260       |
| Item54                 | 350       | 1         | 4         | 2.65      | 1.087          | 1.181     | -.176     | .130       | -1.259    | .260       |
| Item55                 | 350       | 1         | 4         | 2.89      | 1.056          | 1.115     | -.463     | .130       | -1.059    | .260       |

## 2. Reliability

### 2.1 Before EFA (55 items)

#### Reliability Statistics

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .967             | .968   | 55         |

### 2.2 Before EFA after delete 12 items (43 items)

#### Reliability Statistics

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .962             | .963   | 43         |





## 3. Correlation matrix of all 55 items

|                                |       |        |       |        |       |       |       |       |       |        |        |
|--------------------------------|-------|--------|-------|--------|-------|-------|-------|-------|-------|--------|--------|
|                                | Item1 | Item2  | Item3 | Item4  | Item5 | Item6 | Item7 | Item8 | Item9 | Item10 | Item11 |
| Item1                          | 1.000 | 0.307  | 0.392 | 0.364  | 0.235 | 0.403 | 0.490 | 0.377 | 0.440 | 0.134  | 0.309  |
| Item2                          | 0.307 | 1.000  | 0.493 | 0.524  | 0.332 | 0.312 | 0.394 | 0.348 | 0.260 | 0.109  | 0.180  |
| Item3                          | 0.392 | 0.493  | 1.000 | 0.619  | 0.526 | 0.384 | 0.553 | 0.505 | 0.434 | 0.309  | 0.386  |
| Item4                          | 0.364 | 0.524  | 0.619 | 1.000  | 0.536 | 0.477 | 0.515 | 0.550 | 0.336 | 0.241  | 0.465  |
| Item5                          | 0.235 | 0.332  | 0.526 | 0.536  | 1.000 | 0.507 | 0.317 | 0.459 | 0.289 | 0.296  | 0.355  |
| Item6                          | 0.403 | 0.312  | 0.384 | 0.477  | 0.507 | 1.000 | 0.531 | 0.498 | 0.365 | 0.199  | 0.468  |
| Item7                          | 0.490 | 0.394  | 0.553 | 0.515  | 0.317 | 0.531 | 1.000 | 0.509 | 0.567 | 0.272  | 0.493  |
| Item8                          | 0.377 | 0.348  | 0.505 | 0.550  | 0.459 | 0.498 | 0.509 | 1.000 | 0.452 | 0.174  | 0.390  |
| Item9                          | 0.440 | 0.260  | 0.434 | 0.336  | 0.289 | 0.365 | 0.567 | 0.452 | 1.000 | 0.383  | 0.474  |
| Item10                         | 0.134 | 0.109  | 0.309 | 0.241  | 0.296 | 0.199 | 0.272 | 0.174 | 0.383 | 1.000  | 0.458  |
| Item11                         | 0.309 | 0.180  | 0.386 | 0.465  | 0.355 | 0.468 | 0.493 | 0.390 | 0.474 | 0.458  | 1.000  |
| Item12                         | 0.339 | 0.181  | 0.340 | 0.437  | 0.269 | 0.488 | 0.399 | 0.378 | 0.358 | 0.231  | 0.621  |
| Item13                         | 0.344 | 0.226  | 0.447 | 0.486  | 0.356 | 0.468 | 0.437 | 0.511 | 0.338 | 0.283  | 0.584  |
| Item14                         | 0.232 | 0.216  | 0.274 | 0.466  | 0.414 | 0.437 | 0.329 | 0.319 | 0.302 | 0.290  | 0.452  |
| Item15                         | 0.199 | 0.220  | 0.292 | 0.493  | 0.307 | 0.426 | 0.375 | 0.385 | 0.358 | 0.322  | 0.619  |
| Item16                         | 0.525 | 0.210  | 0.356 | 0.370  | 0.246 | 0.381 | 0.476 | 0.431 | 0.509 | 0.298  | 0.395  |
| Item17                         | 0.260 | 0.227  | 0.272 | 0.158  | 0.266 | 0.287 | 0.417 | 0.228 | 0.474 | 0.115  | 0.239  |
| Item18                         | 0.257 | 0.179  | 0.385 | 0.315  | 0.334 | 0.330 | 0.425 | 0.484 | 0.427 | 0.227  | 0.267  |
| Item19                         | 0.440 | 0.259  | 0.358 | 0.450  | 0.374 | 0.440 | 0.555 | 0.475 | 0.521 | 0.341  | 0.485  |
| Item20                         | 0.382 | 0.323  | 0.391 | 0.493  | 0.320 | 0.262 | 0.513 | 0.427 | 0.418 | 0.361  | 0.469  |
| Item21                         | 0.381 | 0.194  | 0.354 | 0.411  | 0.285 | 0.454 | 0.461 | 0.456 | 0.449 | 0.421  | 0.584  |
| Item22                         | 0.374 | 0.274  | 0.339 | 0.460  | 0.293 | 0.471 | 0.526 | 0.469 | 0.413 | 0.345  | 0.532  |
| Item23                         | 0.402 | 0.268  | 0.156 | 0.303  | 0.154 | 0.245 | 0.357 | 0.171 | 0.273 | 0.171  | 0.257  |
| Item24                         | 0.425 | 0.089  | 0.262 | 0.270  | 0.082 | 0.278 | 0.433 | 0.263 | 0.437 | 0.349  | 0.412  |
| Item25                         | 0.430 | 0.297  | 0.375 | 0.415  | 0.340 | 0.403 | 0.458 | 0.443 | 0.554 | 0.357  | 0.415  |
| Item26                         | 0.404 | 0.300  | 0.316 | 0.266  | 0.127 | 0.312 | 0.556 | 0.277 | 0.485 | 0.180  | 0.293  |
| Item27                         | 0.335 | 0.176  | 0.353 | 0.352  | 0.179 | 0.322 | 0.431 | 0.286 | 0.339 | 0.291  | 0.380  |
| Item28                         | 0.202 | 0.152  | 0.284 | 0.336  | 0.214 | 0.284 | 0.222 | 0.299 | 0.184 | 0.168  | 0.319  |
| Item29                         | 0.449 | 0.229  | 0.324 | 0.356  | 0.218 | 0.448 | 0.512 | 0.417 | 0.506 | 0.259  | 0.397  |
| Item30                         | 0.366 | 0.294  | 0.299 | 0.380  | 0.262 | 0.441 | 0.521 | 0.480 | 0.459 | 0.228  | 0.417  |
| Item31                         | 0.354 | 0.364  | 0.274 | 0.398  | 0.247 | 0.360 | 0.455 | 0.329 | 0.306 | 0.112  | 0.287  |
| Item32                         | 0.455 | 0.202  | 0.144 | 0.288  | 0.162 | 0.280 | 0.329 | 0.181 | 0.315 | 0.108  | 0.215  |
| Item33                         | 0.411 | 0.269  | 0.408 | 0.463  | 0.258 | 0.272 | 0.419 | 0.278 | 0.295 | 0.217  | 0.315  |
| Item34                         | 0.439 | 0.279  | 0.331 | 0.388  | 0.220 | 0.294 | 0.472 | 0.252 | 0.403 | 0.155  | 0.264  |
| Item35                         | 0.282 | 0.296  | 0.326 | 0.303  | 0.267 | 0.187 | 0.346 | 0.251 | 0.438 | 0.161  | 0.217  |
| Item36                         | 0.174 | 0.193  | 0.412 | 0.271  | 0.325 | 0.104 | 0.269 | 0.280 | 0.395 | 0.368  | 0.328  |
| Item37                         | 0.275 | 0.257  | 0.313 | 0.319  | 0.234 | 0.250 | 0.394 | 0.363 | 0.370 | 0.196  | 0.313  |
| Item38                         | 0.290 | 0.280  | 0.501 | 0.347  | 0.358 | 0.306 | 0.532 | 0.348 | 0.369 | 0.209  | 0.315  |
| Item39                         | 0.190 | 0.167  | 0.267 | 0.325  | 0.186 | 0.337 | 0.386 | 0.316 | 0.239 | 0.342  | 0.424  |
| Item40                         | 0.208 | 0.308  | 0.415 | 0.548  | 0.441 | 0.419 | 0.360 | 0.494 | 0.290 | 0.337  | 0.412  |
| Item41                         | 0.300 | 0.328  | 0.410 | 0.508  | 0.320 | 0.407 | 0.461 | 0.467 | 0.389 | 0.354  | 0.517  |
| Item42                         | 0.404 | 0.254  | 0.342 | 0.431  | 0.211 | 0.351 | 0.544 | 0.416 | 0.488 | 0.256  | 0.450  |
| Item43                         | 0.418 | 0.256  | 0.343 | 0.476  | 0.238 | 0.440 | 0.493 | 0.450 | 0.389 | 0.293  | 0.484  |
| Item44                         | 0.054 | -0.024 | 0.013 | -0.056 | 0.094 | 0.184 | 0.094 | 0.066 | 0.170 | 0.096  | 0.114  |
| Item45                         | 0.150 | 0.259  | 0.404 | 0.368  | 0.285 | 0.267 | 0.358 | 0.309 | 0.325 | 0.463  | 0.434  |
| Item46                         | 0.115 | 0.249  | 0.321 | 0.365  | 0.238 | 0.259 | 0.257 | 0.337 | 0.183 | 0.396  | 0.411  |
| Item47                         | 0.327 | 0.246  | 0.334 | 0.414  | 0.204 | 0.331 | 0.509 | 0.385 | 0.510 | 0.346  | 0.469  |
| Item48                         | 0.289 | 0.230  | 0.274 | 0.407  | 0.238 | 0.321 | 0.452 | 0.370 | 0.445 | 0.374  | 0.484  |
| Item49                         | 0.112 | 0.228  | 0.370 | 0.400  | 0.398 | 0.258 | 0.292 | 0.382 | 0.284 | 0.330  | 0.393  |
| Item50                         | 0.214 | 0.139  | 0.280 | 0.328  | 0.309 | 0.306 | 0.297 | 0.339 | 0.366 | 0.290  | 0.428  |
| Item51                         | 0.343 | 0.245  | 0.314 | 0.433  | 0.332 | 0.455 | 0.465 | 0.538 | 0.317 | 0.241  | 0.459  |
| Item52                         | 0.339 | 0.159  | 0.375 | 0.349  | 0.353 | 0.344 | 0.489 | 0.380 | 0.410 | 0.322  | 0.386  |
| Item53                         | 0.229 | 0.245  | 0.450 | 0.369  | 0.383 | 0.309 | 0.451 | 0.462 | 0.433 | 0.327  | 0.372  |
| Item54                         | 0.169 | 0.176  | 0.241 | 0.293  | 0.313 | 0.301 | 0.388 | 0.391 | 0.387 | 0.256  | 0.285  |
| Item55                         | 0.292 | 0.168  | 0.181 | 0.286  | 0.173 | 0.413 | 0.356 | 0.370 | 0.283 | 0.163  | 0.306  |
| Item                           | 1     | 2      | 3     | 4      | 5     | 6     | 7     | 8     | 9     | 10     | 11     |
| Number of item correlation <.3 | 22    | 42     | 15    | 9      | 30    | 16    | 7     | 13    | 11    | 33     | 11     |
| %                              | 40.00 | 76.36  | 27.27 | 16.36  | 54.55 | 29.09 | 12.73 | 23.64 | 20.00 | 60.00  | 20.00  |
| Average correlation            | 0.328 | 0.261  | 0.360 | 0.398  | 0.303 | 0.365 | 0.435 | 0.386 | 0.393 | 0.282  | 0.404  |

|                                | Item12 | Item13 | Item14 | Item15 | Item16 | Item17 | Item18 | Item19 | Item20 | Item21 | Item22 |
|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Item1                          | 0.339  | 0.344  | 0.232  | 0.199  | 0.525  | 0.260  | 0.257  | 0.440  | 0.382  | 0.381  | 0.374  |
| Item2                          | 0.181  | 0.226  | 0.216  | 0.220  | 0.210  | 0.227  | 0.179  | 0.259  | 0.323  | 0.194  | 0.274  |
| Item3                          | 0.340  | 0.447  | 0.274  | 0.292  | 0.356  | 0.272  | 0.385  | 0.358  | 0.391  | 0.354  | 0.339  |
| Item4                          | 0.437  | 0.486  | 0.466  | 0.493  | 0.370  | 0.158  | 0.315  | 0.450  | 0.493  | 0.411  | 0.460  |
| Item5                          | 0.269  | 0.356  | 0.414  | 0.307  | 0.246  | 0.266  | 0.334  | 0.374  | 0.320  | 0.285  | 0.293  |
| Item6                          | 0.488  | 0.468  | 0.437  | 0.426  | 0.381  | 0.287  | 0.330  | 0.440  | 0.262  | 0.454  | 0.471  |
| Item7                          | 0.399  | 0.437  | 0.329  | 0.375  | 0.476  | 0.417  | 0.425  | 0.555  | 0.513  | 0.461  | 0.526  |
| Item8                          | 0.378  | 0.511  | 0.319  | 0.385  | 0.431  | 0.228  | 0.484  | 0.475  | 0.427  | 0.456  | 0.469  |
| Item9                          | 0.358  | 0.338  | 0.302  | 0.358  | 0.509  | 0.474  | 0.427  | 0.521  | 0.418  | 0.449  | 0.413  |
| Item10                         | 0.231  | 0.283  | 0.290  | 0.322  | 0.298  | 0.115  | 0.227  | 0.341  | 0.361  | 0.421  | 0.345  |
| Item11                         | 0.621  | 0.584  | 0.452  | 0.619  | 0.395  | 0.239  | 0.267  | 0.485  | 0.469  | 0.584  | 0.532  |
| Item12                         | 1.000  | 0.585  | 0.443  | 0.583  | 0.404  | 0.107  | 0.221  | 0.443  | 0.373  | 0.526  | 0.464  |
| Item13                         | 0.585  | 1.000  | 0.550  | 0.651  | 0.436  | 0.090  | 0.400  | 0.470  | 0.372  | 0.593  | 0.425  |
| Item14                         | 0.443  | 0.550  | 1.000  | 0.707  | 0.317  | 0.209  | 0.182  | 0.413  | 0.356  | 0.443  | 0.370  |
| Item15                         | 0.583  | 0.651  | 0.707  | 1.000  | 0.412  | 0.158  | 0.286  | 0.434  | 0.426  | 0.532  | 0.418  |
| Item16                         | 0.404  | 0.436  | 0.317  | 0.412  | 1.000  | 0.287  | 0.435  | 0.577  | 0.451  | 0.517  | 0.427  |
| Item17                         | 0.107  | 0.090  | 0.209  | 0.158  | 0.287  | 1.000  | 0.451  | 0.367  | 0.312  | 0.213  | 0.213  |
| Item18                         | 0.221  | 0.400  | 0.182  | 0.286  | 0.435  | 0.451  | 1.000  | 0.477  | 0.370  | 0.386  | 0.270  |
| Item19                         | 0.443  | 0.470  | 0.413  | 0.434  | 0.577  | 0.367  | 0.477  | 1.000  | 0.630  | 0.634  | 0.608  |
| Item20                         | 0.373  | 0.372  | 0.356  | 0.426  | 0.451  | 0.312  | 0.370  | 0.630  | 1.000  | 0.592  | 0.629  |
| Item21                         | 0.526  | 0.593  | 0.443  | 0.532  | 0.517  | 0.213  | 0.386  | 0.634  | 0.592  | 1.000  | 0.598  |
| Item22                         | 0.464  | 0.425  | 0.370  | 0.418  | 0.427  | 0.213  | 0.270  | 0.608  | 0.629  | 0.598  | 1.000  |
| Item23                         | 0.296  | 0.230  | 0.320  | 0.261  | 0.279  | 0.202  | 0.077  | 0.335  | 0.364  | 0.310  | 0.435  |
| Item24                         | 0.431  | 0.345  | 0.326  | 0.412  | 0.445  | 0.163  | 0.259  | 0.482  | 0.484  | 0.512  | 0.552  |
| Item25                         | 0.399  | 0.416  | 0.368  | 0.377  | 0.461  | 0.388  | 0.503  | 0.623  | 0.550  | 0.524  | 0.458  |
| Item26                         | 0.342  | 0.272  | 0.223  | 0.276  | 0.443  | 0.344  | 0.233  | 0.391  | 0.395  | 0.386  | 0.441  |
| Item27                         | 0.380  | 0.401  | 0.264  | 0.331  | 0.299  | 0.166  | 0.319  | 0.416  | 0.408  | 0.383  | 0.477  |
| Item28                         | 0.317  | 0.459  | 0.259  | 0.363  | 0.232  | 0.000  | 0.257  | 0.298  | 0.280  | 0.314  | 0.381  |
| Item29                         | 0.444  | 0.519  | 0.432  | 0.502  | 0.562  | 0.214  | 0.330  | 0.559  | 0.478  | 0.582  | 0.496  |
| Item30                         | 0.391  | 0.463  | 0.370  | 0.482  | 0.526  | 0.203  | 0.388  | 0.622  | 0.554  | 0.540  | 0.623  |
| Item31                         | 0.301  | 0.330  | 0.373  | 0.299  | 0.297  | 0.283  | 0.192  | 0.508  | 0.460  | 0.355  | 0.452  |
| Item32                         | 0.376  | 0.293  | 0.263  | 0.225  | 0.348  | 0.275  | 0.172  | 0.427  | 0.379  | 0.325  | 0.317  |
| Item33                         | 0.332  | 0.419  | 0.324  | 0.351  | 0.287  | 0.278  | 0.271  | 0.491  | 0.447  | 0.389  | 0.410  |
| Item34                         | 0.320  | 0.331  | 0.350  | 0.297  | 0.331  | 0.385  | 0.226  | 0.443  | 0.497  | 0.410  | 0.347  |
| Item35                         | 0.336  | 0.179  | 0.330  | 0.252  | 0.255  | 0.462  | 0.297  | 0.449  | 0.431  | 0.320  | 0.288  |
| Item36                         | 0.129  | 0.289  | 0.197  | 0.293  | 0.226  | 0.305  | 0.429  | 0.337  | 0.370  | 0.335  | 0.387  |
| Item37                         | 0.237  | 0.262  | 0.312  | 0.263  | 0.264  | 0.347  | 0.332  | 0.474  | 0.475  | 0.341  | 0.416  |
| Item38                         | 0.180  | 0.382  | 0.202  | 0.220  | 0.240  | 0.431  | 0.412  | 0.356  | 0.356  | 0.255  | 0.335  |
| Item39                         | 0.383  | 0.380  | 0.340  | 0.362  | 0.275  | 0.065  | 0.194  | 0.429  | 0.448  | 0.450  | 0.525  |
| Item40                         | 0.447  | 0.530  | 0.452  | 0.526  | 0.301  | 0.115  | 0.425  | 0.415  | 0.449  | 0.486  | 0.457  |
| Item41                         | 0.498  | 0.484  | 0.442  | 0.513  | 0.351  | 0.110  | 0.274  | 0.487  | 0.565  | 0.564  | 0.535  |
| Item42                         | 0.442  | 0.422  | 0.387  | 0.441  | 0.360  | 0.275  | 0.385  | 0.455  | 0.521  | 0.432  | 0.433  |
| Item43                         | 0.543  | 0.508  | 0.422  | 0.538  | 0.446  | 0.097  | 0.319  | 0.488  | 0.517  | 0.503  | 0.525  |
| Item44                         | 0.101  | 0.028  | 0.117  | 0.032  | 0.043  | 0.166  | 0.039  | 0.131  | 0.022  | 0.179  | 0.111  |
| Item45                         | 0.241  | 0.465  | 0.280  | 0.417  | 0.269  | 0.242  | 0.406  | 0.353  | 0.360  | 0.435  | 0.356  |
| Item46                         | 0.308  | 0.492  | 0.371  | 0.489  | 0.248  | 0.097  | 0.361  | 0.297  | 0.332  | 0.394  | 0.330  |
| Item47                         | 0.438  | 0.445  | 0.461  | 0.481  | 0.391  | 0.297  | 0.432  | 0.475  | 0.502  | 0.488  | 0.422  |
| Item48                         | 0.405  | 0.461  | 0.459  | 0.474  | 0.394  | 0.219  | 0.410  | 0.527  | 0.542  | 0.488  | 0.454  |
| Item49                         | 0.358  | 0.442  | 0.351  | 0.439  | 0.212  | 0.154  | 0.447  | 0.348  | 0.385  | 0.388  | 0.388  |
| Item50                         | 0.341  | 0.442  | 0.409  | 0.385  | 0.211  | 0.208  | 0.442  | 0.352  | 0.317  | 0.449  | 0.355  |
| Item51                         | 0.462  | 0.531  | 0.425  | 0.485  | 0.412  | 0.156  | 0.407  | 0.507  | 0.492  | 0.458  | 0.508  |
| Item52                         | 0.287  | 0.402  | 0.236  | 0.321  | 0.382  | 0.364  | 0.676  | 0.419  | 0.429  | 0.419  | 0.312  |
| Item53                         | 0.266  | 0.450  | 0.262  | 0.331  | 0.362  | 0.390  | 0.633  | 0.431  | 0.363  | 0.407  | 0.351  |
| Item54                         | 0.309  | 0.321  | 0.242  | 0.320  | 0.357  | 0.346  | 0.512  | 0.359  | 0.328  | 0.353  | 0.254  |
| Item55                         | 0.328  | 0.360  | 0.183  | 0.319  | 0.414  | 0.063  | 0.296  | 0.461  | 0.348  | 0.455  | 0.488  |
| Item                           | 12     | 13     | 14     | 15     | 16     | 17     | 18     | 19     | 20     | 21     | 22     |
| Number of item correlation <.3 | 13     | 10     | 18     | 15     | 19     | 38     | 21     | 4      | 3      | 5      | 7      |
| %                              | 23.64  | 18.18  | 32.73  | 27.27  | 34.55  | 69.09  | 38.18  | 7.27   | 5.45   | 9.09   | 12.73  |
| Average correlation            | 0.374  | 0.415  | 0.354  | 0.394  | 0.371  | 0.258  | 0.354  | 0.453  | 0.431  | 0.438  | 0.428  |

|                                | Item23 | Item24 | Item25 | Item26 | Item27 | Item28 | Item29 | Item30 | Item31 | Item32 | Item33 |
|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Item1                          | 0.402  | 0.425  | 0.430  | 0.404  | 0.335  | 0.202  | 0.449  | 0.366  | 0.354  | 0.455  | 0.411  |
| Item2                          | 0.268  | 0.089  | 0.297  | 0.300  | 0.176  | 0.152  | 0.229  | 0.294  | 0.364  | 0.202  | 0.269  |
| Item3                          | 0.156  | 0.262  | 0.375  | 0.316  | 0.353  | 0.284  | 0.324  | 0.299  | 0.274  | 0.144  | 0.408  |
| Item4                          | 0.303  | 0.270  | 0.415  | 0.266  | 0.352  | 0.336  | 0.356  | 0.380  | 0.398  | 0.288  | 0.463  |
| Item5                          | 0.154  | 0.082  | 0.340  | 0.127  | 0.179  | 0.214  | 0.218  | 0.262  | 0.247  | 0.162  | 0.258  |
| Item6                          | 0.245  | 0.278  | 0.403  | 0.312  | 0.322  | 0.284  | 0.448  | 0.441  | 0.360  | 0.280  | 0.272  |
| Item7                          | 0.357  | 0.433  | 0.458  | 0.556  | 0.431  | 0.222  | 0.512  | 0.521  | 0.455  | 0.329  | 0.419  |
| Item8                          | 0.171  | 0.263  | 0.443  | 0.277  | 0.286  | 0.299  | 0.417  | 0.480  | 0.329  | 0.181  | 0.278  |
| Item9                          | 0.273  | 0.437  | 0.554  | 0.485  | 0.339  | 0.184  | 0.506  | 0.459  | 0.306  | 0.315  | 0.295  |
| Item10                         | 0.171  | 0.349  | 0.357  | 0.180  | 0.291  | 0.168  | 0.259  | 0.228  | 0.112  | 0.108  | 0.217  |
| Item11                         | 0.257  | 0.412  | 0.415  | 0.293  | 0.380  | 0.319  | 0.397  | 0.417  | 0.287  | 0.215  | 0.315  |
| Item12                         | 0.296  | 0.431  | 0.399  | 0.342  | 0.380  | 0.317  | 0.444  | 0.391  | 0.301  | 0.376  | 0.332  |
| Item13                         | 0.230  | 0.345  | 0.416  | 0.272  | 0.401  | 0.459  | 0.519  | 0.463  | 0.330  | 0.293  | 0.419  |
| Item14                         | 0.320  | 0.326  | 0.368  | 0.223  | 0.264  | 0.259  | 0.432  | 0.370  | 0.373  | 0.263  | 0.324  |
| Item15                         | 0.261  | 0.412  | 0.377  | 0.276  | 0.331  | 0.363  | 0.502  | 0.482  | 0.299  | 0.225  | 0.351  |
| Item16                         | 0.279  | 0.445  | 0.461  | 0.443  | 0.299  | 0.232  | 0.562  | 0.526  | 0.297  | 0.348  | 0.287  |
| Item17                         | 0.202  | 0.163  | 0.388  | 0.344  | 0.166  | 0.000  | 0.214  | 0.203  | 0.283  | 0.275  | 0.278  |
| Item18                         | 0.077  | 0.259  | 0.503  | 0.233  | 0.319  | 0.257  | 0.330  | 0.388  | 0.192  | 0.172  | 0.271  |
| Item19                         | 0.335  | 0.482  | 0.623  | 0.391  | 0.416  | 0.298  | 0.559  | 0.622  | 0.508  | 0.427  | 0.491  |
| Item20                         | 0.364  | 0.484  | 0.550  | 0.395  | 0.408  | 0.280  | 0.478  | 0.554  | 0.460  | 0.379  | 0.447  |
| Item21                         | 0.310  | 0.512  | 0.524  | 0.386  | 0.383  | 0.314  | 0.582  | 0.540  | 0.355  | 0.325  | 0.389  |
| Item22                         | 0.435  | 0.552  | 0.458  | 0.441  | 0.477  | 0.381  | 0.496  | 0.623  | 0.452  | 0.317  | 0.410  |
| Item23                         | 1.000  | 0.487  | 0.356  | 0.523  | 0.354  | 0.354  | 0.446  | 0.373  | 0.469  | 0.528  | 0.562  |
| Item24                         | 0.487  | 1.000  | 0.538  | 0.578  | 0.521  | 0.355  | 0.612  | 0.565  | 0.358  | 0.476  | 0.451  |
| Item25                         | 0.356  | 0.538  | 1.000  | 0.383  | 0.387  | 0.308  | 0.546  | 0.574  | 0.497  | 0.417  | 0.477  |
| Item26                         | 0.523  | 0.578  | 0.383  | 1.000  | 0.436  | 0.318  | 0.546  | 0.463  | 0.419  | 0.488  | 0.415  |
| Item27                         | 0.354  | 0.521  | 0.387  | 0.436  | 1.000  | 0.682  | 0.481  | 0.460  | 0.432  | 0.409  | 0.496  |
| Item28                         | 0.354  | 0.355  | 0.308  | 0.318  | 0.682  | 1.000  | 0.489  | 0.456  | 0.355  | 0.349  | 0.489  |
| Item29                         | 0.446  | 0.612  | 0.546  | 0.546  | 0.481  | 0.489  | 1.000  | 0.728  | 0.456  | 0.496  | 0.513  |
| Item30                         | 0.373  | 0.565  | 0.574  | 0.463  | 0.460  | 0.456  | 0.728  | 1.000  | 0.583  | 0.336  | 0.408  |
| Item31                         | 0.469  | 0.358  | 0.497  | 0.419  | 0.432  | 0.355  | 0.456  | 0.583  | 1.000  | 0.512  | 0.564  |
| Item32                         | 0.528  | 0.476  | 0.417  | 0.488  | 0.409  | 0.349  | 0.496  | 0.336  | 0.512  | 1.000  | 0.571  |
| Item33                         | 0.562  | 0.451  | 0.477  | 0.415  | 0.496  | 0.489  | 0.513  | 0.408  | 0.564  | 0.571  | 1.000  |
| Item34                         | 0.477  | 0.408  | 0.469  | 0.456  | 0.393  | 0.327  | 0.456  | 0.342  | 0.513  | 0.603  | 0.682  |
| Item35                         | 0.354  | 0.276  | 0.469  | 0.375  | 0.296  | 0.182  | 0.349  | 0.290  | 0.408  | 0.429  | 0.483  |
| Item36                         | 0.231  | 0.317  | 0.354  | 0.284  | 0.405  | 0.476  | 0.308  | 0.357  | 0.228  | 0.171  | 0.469  |
| Item37                         | 0.282  | 0.289  | 0.455  | 0.265  | 0.317  | 0.240  | 0.394  | 0.505  | 0.406  | 0.210  | 0.463  |
| Item38                         | 0.234  | 0.250  | 0.333  | 0.432  | 0.433  | 0.389  | 0.392  | 0.356  | 0.393  | 0.319  | 0.472  |
| Item39                         | 0.284  | 0.432  | 0.411  | 0.298  | 0.399  | 0.332  | 0.406  | 0.483  | 0.358  | 0.245  | 0.312  |
| Item40                         | 0.279  | 0.323  | 0.376  | 0.247  | 0.378  | 0.436  | 0.430  | 0.469  | 0.301  | 0.175  | 0.409  |
| Item41                         | 0.239  | 0.455  | 0.457  | 0.313  | 0.347  | 0.253  | 0.437  | 0.491  | 0.326  | 0.257  | 0.302  |
| Item42                         | 0.272  | 0.495  | 0.412  | 0.424  | 0.420  | 0.259  | 0.455  | 0.422  | 0.365  | 0.382  | 0.335  |
| Item43                         | 0.311  | 0.555  | 0.453  | 0.398  | 0.445  | 0.335  | 0.509  | 0.532  | 0.362  | 0.386  | 0.341  |
| Item44                         | 0.077  | 0.039  | 0.124  | 0.126  | -0.013 | 0.009  | 0.110  | 0.058  | 0.050  | 0.086  | 0.043  |
| Item45                         | 0.243  | 0.289  | 0.319  | 0.268  | 0.405  | 0.424  | 0.355  | 0.333  | 0.265  | 0.135  | 0.319  |
| Item46                         | 0.211  | 0.279  | 0.306  | 0.183  | 0.403  | 0.405  | 0.339  | 0.370  | 0.265  | 0.118  | 0.309  |
| Item47                         | 0.268  | 0.462  | 0.463  | 0.388  | 0.454  | 0.278  | 0.485  | 0.456  | 0.379  | 0.307  | 0.350  |
| Item48                         | 0.255  | 0.451  | 0.435  | 0.339  | 0.389  | 0.257  | 0.447  | 0.494  | 0.358  | 0.247  | 0.336  |
| Item49                         | 0.101  | 0.210  | 0.286  | 0.204  | 0.249  | 0.298  | 0.306  | 0.397  | 0.246  | 0.082  | 0.250  |
| Item50                         | 0.214  | 0.292  | 0.299  | 0.231  | 0.274  | 0.220  | 0.323  | 0.329  | 0.238  | 0.131  | 0.207  |
| Item51                         | 0.300  | 0.403  | 0.487  | 0.288  | 0.345  | 0.314  | 0.467  | 0.502  | 0.402  | 0.334  | 0.391  |
| Item52                         | 0.201  | 0.365  | 0.447  | 0.318  | 0.427  | 0.348  | 0.384  | 0.357  | 0.228  | 0.261  | 0.337  |
| Item53                         | 0.190  | 0.312  | 0.440  | 0.336  | 0.409  | 0.360  | 0.394  | 0.375  | 0.285  | 0.179  | 0.353  |
| Item54                         | 0.090  | 0.228  | 0.365  | 0.278  | 0.230  | 0.144  | 0.335  | 0.331  | 0.161  | 0.151  | 0.178  |
| Item55                         | 0.252  | 0.320  | 0.374  | 0.282  | 0.312  | 0.296  | 0.441  | 0.455  | 0.304  | 0.270  | 0.318  |
| Item                           | 23     | 24     | 25     | 26     | 27     | 28     | 29     | 30     | 31     | 32     | 33     |
| Number of item correlation <.3 | 32     | 17     | 4      | 21     | 12     | 26     | 5      | 7      | 17     | 28     | 13     |
| %                              | 58.18  | 30.91  | 7.27   | 38.18  | 21.82  | 47.27  | 9.09   | 12.73  | 30.91  | 50.91  | 23.64  |
| Average correlation            | 0.303  | 0.384  | 0.429  | 0.356  | 0.376  | 0.319  | 0.438  | 0.436  | 0.360  | 0.312  | 0.386  |

|                                | Item34 | Item35 | Item36 | Item37 | Item38 | Item39 | Item40 | Item41 | Item42 | Item43 | Item44 |
|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Item1                          | 0.439  | 0.282  | 0.174  | 0.275  | 0.290  | 0.190  | 0.208  | 0.300  | 0.404  | 0.418  | 0.054  |
| Item2                          | 0.279  | 0.296  | 0.193  | 0.257  | 0.280  | 0.167  | 0.308  | 0.328  | 0.254  | 0.256  | -0.024 |
| Item3                          | 0.331  | 0.326  | 0.412  | 0.313  | 0.501  | 0.267  | 0.415  | 0.410  | 0.342  | 0.343  | 0.013  |
| Item4                          | 0.388  | 0.303  | 0.271  | 0.319  | 0.347  | 0.325  | 0.548  | 0.508  | 0.431  | 0.476  | -0.056 |
| Item5                          | 0.220  | 0.267  | 0.325  | 0.234  | 0.358  | 0.186  | 0.441  | 0.320  | 0.211  | 0.238  | 0.094  |
| Item6                          | 0.294  | 0.187  | 0.104  | 0.250  | 0.306  | 0.337  | 0.419  | 0.407  | 0.351  | 0.440  | 0.184  |
| Item7                          | 0.472  | 0.346  | 0.269  | 0.394  | 0.532  | 0.386  | 0.360  | 0.461  | 0.544  | 0.493  | 0.094  |
| Item8                          | 0.252  | 0.251  | 0.280  | 0.363  | 0.348  | 0.316  | 0.494  | 0.467  | 0.416  | 0.450  | 0.066  |
| Item9                          | 0.403  | 0.438  | 0.395  | 0.370  | 0.369  | 0.239  | 0.290  | 0.389  | 0.488  | 0.389  | 0.170  |
| Item10                         | 0.155  | 0.161  | 0.368  | 0.196  | 0.209  | 0.342  | 0.337  | 0.354  | 0.256  | 0.293  | 0.096  |
| Item11                         | 0.264  | 0.217  | 0.328  | 0.313  | 0.315  | 0.424  | 0.412  | 0.517  | 0.450  | 0.484  | 0.114  |
| Item12                         | 0.320  | 0.336  | 0.129  | 0.237  | 0.180  | 0.383  | 0.447  | 0.498  | 0.442  | 0.543  | 0.101  |
| Item13                         | 0.331  | 0.179  | 0.289  | 0.262  | 0.382  | 0.380  | 0.530  | 0.484  | 0.422  | 0.508  | 0.028  |
| Item14                         | 0.350  | 0.330  | 0.197  | 0.312  | 0.202  | 0.340  | 0.452  | 0.442  | 0.387  | 0.422  | 0.117  |
| Item15                         | 0.297  | 0.252  | 0.293  | 0.263  | 0.220  | 0.362  | 0.526  | 0.513  | 0.441  | 0.538  | 0.032  |
| Item16                         | 0.331  | 0.255  | 0.226  | 0.264  | 0.240  | 0.275  | 0.301  | 0.351  | 0.360  | 0.446  | 0.043  |
| Item17                         | 0.385  | 0.462  | 0.305  | 0.347  | 0.431  | 0.065  | 0.115  | 0.110  | 0.275  | 0.097  | 0.166  |
| Item18                         | 0.226  | 0.297  | 0.429  | 0.332  | 0.412  | 0.194  | 0.425  | 0.274  | 0.385  | 0.319  | 0.039  |
| Item19                         | 0.443  | 0.449  | 0.337  | 0.474  | 0.356  | 0.429  | 0.415  | 0.487  | 0.455  | 0.488  | 0.131  |
| Item20                         | 0.497  | 0.431  | 0.370  | 0.475  | 0.356  | 0.448  | 0.449  | 0.565  | 0.521  | 0.517  | 0.022  |
| Item21                         | 0.410  | 0.320  | 0.335  | 0.341  | 0.255  | 0.450  | 0.486  | 0.564  | 0.432  | 0.503  | 0.179  |
| Item22                         | 0.347  | 0.288  | 0.387  | 0.416  | 0.335  | 0.525  | 0.457  | 0.535  | 0.433  | 0.525  | 0.111  |
| Item23                         | 0.477  | 0.354  | 0.231  | 0.282  | 0.234  | 0.284  | 0.279  | 0.239  | 0.272  | 0.311  | 0.077  |
| Item24                         | 0.408  | 0.276  | 0.317  | 0.289  | 0.250  | 0.432  | 0.323  | 0.455  | 0.495  | 0.555  | 0.039  |
| Item25                         | 0.469  | 0.469  | 0.354  | 0.455  | 0.333  | 0.411  | 0.376  | 0.457  | 0.412  | 0.453  | 0.124  |
| Item26                         | 0.456  | 0.375  | 0.284  | 0.265  | 0.432  | 0.298  | 0.247  | 0.313  | 0.424  | 0.398  | 0.126  |
| Item27                         | 0.393  | 0.296  | 0.405  | 0.317  | 0.433  | 0.399  | 0.378  | 0.347  | 0.420  | 0.445  | -0.013 |
| Item28                         | 0.327  | 0.182  | 0.476  | 0.240  | 0.389  | 0.332  | 0.436  | 0.253  | 0.259  | 0.335  | 0.009  |
| Item29                         | 0.456  | 0.349  | 0.308  | 0.394  | 0.392  | 0.406  | 0.430  | 0.437  | 0.455  | 0.509  | 0.110  |
| Item30                         | 0.342  | 0.290  | 0.357  | 0.505  | 0.356  | 0.483  | 0.469  | 0.491  | 0.422  | 0.532  | 0.058  |
| Item31                         | 0.513  | 0.408  | 0.228  | 0.406  | 0.393  | 0.358  | 0.301  | 0.326  | 0.365  | 0.362  | 0.050  |
| Item32                         | 0.603  | 0.429  | 0.171  | 0.210  | 0.319  | 0.245  | 0.175  | 0.257  | 0.382  | 0.386  | 0.086  |
| Item33                         | 0.682  | 0.483  | 0.469  | 0.463  | 0.472  | 0.312  | 0.409  | 0.302  | 0.335  | 0.341  | 0.043  |
| Item34                         | 1.000  | 0.579  | 0.346  | 0.396  | 0.447  | 0.268  | 0.254  | 0.270  | 0.414  | 0.319  | 0.088  |
| Item35                         | 0.579  | 1.000  | 0.396  | 0.416  | 0.380  | 0.181  | 0.232  | 0.282  | 0.341  | 0.272  | 0.181  |
| Item36                         | 0.346  | 0.396  | 1.000  | 0.361  | 0.501  | 0.287  | 0.374  | 0.261  | 0.237  | 0.178  | 0.063  |
| Item37                         | 0.396  | 0.416  | 0.361  | 1.000  | 0.317  | 0.266  | 0.369  | 0.301  | 0.330  | 0.290  | 0.011  |
| Item38                         | 0.447  | 0.380  | 0.501  | 0.317  | 1.000  | 0.359  | 0.383  | 0.301  | 0.417  | 0.328  | 0.132  |
| Item39                         | 0.268  | 0.181  | 0.287  | 0.266  | 0.359  | 1.000  | 0.464  | 0.587  | 0.422  | 0.537  | 0.141  |
| Item40                         | 0.254  | 0.232  | 0.374  | 0.369  | 0.383  | 0.464  | 1.000  | 0.596  | 0.473  | 0.528  | 0.069  |
| Item41                         | 0.270  | 0.282  | 0.261  | 0.301  | 0.301  | 0.587  | 0.596  | 1.000  | 0.664  | 0.771  | 0.076  |
| Item42                         | 0.414  | 0.341  | 0.237  | 0.330  | 0.417  | 0.422  | 0.473  | 0.664  | 1.000  | 0.788  | 0.159  |
| Item43                         | 0.319  | 0.272  | 0.178  | 0.290  | 0.328  | 0.537  | 0.528  | 0.771  | 0.788  | 1.000  | 0.149  |
| Item44                         | 0.088  | 0.181  | 0.063  | 0.011  | 0.132  | 0.141  | 0.069  | 0.076  | 0.159  | 0.149  | 1.000  |
| Item45                         | 0.259  | 0.197  | 0.460  | 0.233  | 0.464  | 0.476  | 0.515  | 0.369  | 0.394  | 0.388  | 0.176  |
| Item46                         | 0.159  | 0.174  | 0.349  | 0.219  | 0.367  | 0.468  | 0.581  | 0.432  | 0.402  | 0.446  | 0.143  |
| Item47                         | 0.351  | 0.379  | 0.264  | 0.329  | 0.399  | 0.408  | 0.506  | 0.571  | 0.749  | 0.653  | 0.241  |
| Item48                         | 0.323  | 0.371  | 0.269  | 0.376  | 0.345  | 0.444  | 0.539  | 0.608  | 0.694  | 0.658  | 0.210  |
| Item49                         | 0.152  | 0.280  | 0.419  | 0.266  | 0.441  | 0.320  | 0.631  | 0.507  | 0.487  | 0.476  | 0.158  |
| Item50                         | 0.157  | 0.298  | 0.329  | 0.218  | 0.312  | 0.296  | 0.574  | 0.497  | 0.523  | 0.453  | 0.216  |
| Item51                         | 0.343  | 0.247  | 0.193  | 0.376  | 0.282  | 0.439  | 0.539  | 0.580  | 0.515  | 0.561  | 0.040  |
| Item52                         | 0.342  | 0.281  | 0.432  | 0.304  | 0.478  | 0.286  | 0.479  | 0.337  | 0.503  | 0.420  | 0.080  |
| Item53                         | 0.261  | 0.245  | 0.456  | 0.322  | 0.526  | 0.275  | 0.490  | 0.350  | 0.401  | 0.345  | 0.100  |
| Item54                         | 0.173  | 0.288  | 0.249  | 0.323  | 0.333  | 0.198  | 0.442  | 0.384  | 0.429  | 0.405  | 0.104  |
| Item55                         | 0.217  | 0.113  | 0.224  | 0.245  | 0.170  | 0.447  | 0.387  | 0.408  | 0.237  | 0.372  | 0.141  |
| Item                           | 34     | 35     | 36     | 37     | 38     | 39     | 40     | 41     | 42     | 43     | 44     |
| Number of item correlation <.3 | 19     | 30     | 25     | 22     | 13     | 20     | 9      | 9      | 9      | 8      | 54     |
| %                              | 34.55  | 54.55  | 45.45  | 40.00  | 23.64  | 36.36  | 16.36  | 16.36  | 16.36  | 14.55  | 98.18  |
| Average correlation            | 0.358  | 0.322  | 0.321  | 0.329  | 0.362  | 0.356  | 0.420  | 0.424  | 0.428  | 0.439  | 0.112  |

|                                | Item45 | Item46 | Item47 | Item48 | Item49 | Item50 | Item51 | Item52 | Item53 | Item54 | Item55 |
|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Item1                          | 0.150  | 0.115  | 0.327  | 0.289  | 0.112  | 0.214  | 0.343  | 0.339  | 0.229  | 0.169  | 0.292  |
| Item2                          | 0.259  | 0.249  | 0.246  | 0.230  | 0.228  | 0.139  | 0.245  | 0.159  | 0.245  | 0.176  | 0.168  |
| Item3                          | 0.404  | 0.321  | 0.334  | 0.274  | 0.370  | 0.280  | 0.314  | 0.375  | 0.450  | 0.241  | 0.181  |
| Item4                          | 0.368  | 0.365  | 0.414  | 0.407  | 0.400  | 0.328  | 0.433  | 0.349  | 0.369  | 0.293  | 0.286  |
| Item5                          | 0.285  | 0.238  | 0.204  | 0.238  | 0.398  | 0.309  | 0.332  | 0.353  | 0.383  | 0.313  | 0.173  |
| Item6                          | 0.267  | 0.259  | 0.331  | 0.321  | 0.258  | 0.306  | 0.455  | 0.344  | 0.309  | 0.301  | 0.413  |
| Item7                          | 0.358  | 0.257  | 0.509  | 0.452  | 0.292  | 0.297  | 0.465  | 0.489  | 0.451  | 0.388  | 0.356  |
| Item8                          | 0.309  | 0.337  | 0.385  | 0.370  | 0.382  | 0.339  | 0.538  | 0.380  | 0.462  | 0.391  | 0.370  |
| Item9                          | 0.325  | 0.183  | 0.510  | 0.445  | 0.284  | 0.366  | 0.317  | 0.410  | 0.433  | 0.387  | 0.283  |
| Item10                         | 0.463  | 0.396  | 0.346  | 0.374  | 0.330  | 0.290  | 0.241  | 0.322  | 0.327  | 0.256  | 0.163  |
| Item11                         | 0.434  | 0.411  | 0.469  | 0.484  | 0.393  | 0.428  | 0.459  | 0.386  | 0.372  | 0.285  | 0.306  |
| Item12                         | 0.241  | 0.308  | 0.438  | 0.405  | 0.358  | 0.341  | 0.462  | 0.287  | 0.266  | 0.309  | 0.328  |
| Item13                         | 0.465  | 0.492  | 0.445  | 0.461  | 0.442  | 0.442  | 0.531  | 0.402  | 0.450  | 0.321  | 0.360  |
| Item14                         | 0.280  | 0.371  | 0.461  | 0.459  | 0.351  | 0.409  | 0.425  | 0.236  | 0.262  | 0.242  | 0.183  |
| Item15                         | 0.417  | 0.489  | 0.481  | 0.474  | 0.439  | 0.385  | 0.485  | 0.321  | 0.331  | 0.320  | 0.319  |
| Item16                         | 0.269  | 0.248  | 0.391  | 0.394  | 0.212  | 0.211  | 0.412  | 0.382  | 0.362  | 0.357  | 0.414  |
| Item17                         | 0.242  | 0.097  | 0.297  | 0.219  | 0.154  | 0.208  | 0.156  | 0.364  | 0.390  | 0.346  | 0.063  |
| Item18                         | 0.406  | 0.361  | 0.432  | 0.410  | 0.447  | 0.442  | 0.407  | 0.676  | 0.633  | 0.512  | 0.296  |
| Item19                         | 0.353  | 0.297  | 0.475  | 0.527  | 0.348  | 0.352  | 0.507  | 0.419  | 0.431  | 0.359  | 0.461  |
| Item20                         | 0.360  | 0.332  | 0.502  | 0.542  | 0.385  | 0.317  | 0.492  | 0.429  | 0.363  | 0.328  | 0.348  |
| Item21                         | 0.435  | 0.394  | 0.488  | 0.488  | 0.388  | 0.449  | 0.458  | 0.419  | 0.407  | 0.353  | 0.455  |
| Item22                         | 0.356  | 0.330  | 0.422  | 0.454  | 0.388  | 0.355  | 0.508  | 0.312  | 0.351  | 0.254  | 0.488  |
| Item23                         | 0.243  | 0.211  | 0.268  | 0.255  | 0.101  | 0.214  | 0.300  | 0.201  | 0.190  | 0.090  | 0.252  |
| Item24                         | 0.289  | 0.279  | 0.462  | 0.451  | 0.210  | 0.292  | 0.403  | 0.365  | 0.312  | 0.228  | 0.320  |
| Item25                         | 0.319  | 0.306  | 0.463  | 0.435  | 0.286  | 0.299  | 0.487  | 0.447  | 0.440  | 0.365  | 0.374  |
| Item26                         | 0.268  | 0.183  | 0.388  | 0.339  | 0.204  | 0.231  | 0.288  | 0.318  | 0.336  | 0.278  | 0.282  |
| Item27                         | 0.405  | 0.403  | 0.454  | 0.389  | 0.249  | 0.274  | 0.345  | 0.427  | 0.409  | 0.230  | 0.312  |
| Item28                         | 0.424  | 0.405  | 0.278  | 0.257  | 0.298  | 0.220  | 0.314  | 0.348  | 0.360  | 0.144  | 0.296  |
| Item29                         | 0.355  | 0.339  | 0.485  | 0.447  | 0.306  | 0.323  | 0.467  | 0.384  | 0.394  | 0.335  | 0.441  |
| Item30                         | 0.333  | 0.370  | 0.456  | 0.494  | 0.397  | 0.329  | 0.502  | 0.357  | 0.375  | 0.331  | 0.455  |
| Item31                         | 0.265  | 0.265  | 0.379  | 0.358  | 0.246  | 0.238  | 0.402  | 0.228  | 0.285  | 0.161  | 0.304  |
| Item32                         | 0.135  | 0.118  | 0.307  | 0.247  | 0.082  | 0.131  | 0.334  | 0.261  | 0.179  | 0.151  | 0.270  |
| Item33                         | 0.319  | 0.309  | 0.350  | 0.336  | 0.250  | 0.207  | 0.391  | 0.337  | 0.353  | 0.178  | 0.318  |
| Item34                         | 0.259  | 0.159  | 0.351  | 0.323  | 0.152  | 0.157  | 0.343  | 0.342  | 0.261  | 0.173  | 0.217  |
| Item35                         | 0.197  | 0.174  | 0.379  | 0.371  | 0.280  | 0.298  | 0.247  | 0.281  | 0.245  | 0.288  | 0.113  |
| Item36                         | 0.460  | 0.349  | 0.264  | 0.269  | 0.419  | 0.329  | 0.193  | 0.432  | 0.456  | 0.249  | 0.224  |
| Item37                         | 0.233  | 0.219  | 0.329  | 0.376  | 0.266  | 0.218  | 0.376  | 0.304  | 0.322  | 0.323  | 0.245  |
| Item38                         | 0.464  | 0.367  | 0.399  | 0.345  | 0.441  | 0.312  | 0.282  | 0.478  | 0.526  | 0.333  | 0.170  |
| Item39                         | 0.476  | 0.468  | 0.408  | 0.444  | 0.320  | 0.296  | 0.439  | 0.286  | 0.275  | 0.198  | 0.447  |
| Item40                         | 0.515  | 0.581  | 0.506  | 0.539  | 0.631  | 0.574  | 0.539  | 0.479  | 0.490  | 0.442  | 0.387  |
| Item41                         | 0.369  | 0.432  | 0.571  | 0.608  | 0.507  | 0.497  | 0.580  | 0.337  | 0.350  | 0.384  | 0.408  |
| Item42                         | 0.394  | 0.402  | 0.749  | 0.694  | 0.487  | 0.523  | 0.515  | 0.503  | 0.401  | 0.429  | 0.237  |
| Item43                         | 0.388  | 0.446  | 0.653  | 0.658  | 0.476  | 0.453  | 0.561  | 0.420  | 0.345  | 0.405  | 0.372  |
| Item44                         | 0.176  | 0.143  | 0.241  | 0.210  | 0.158  | 0.216  | 0.040  | 0.080  | 0.100  | 0.104  | 0.141  |
| Item45                         | 1.000  | 0.752  | 0.484  | 0.511  | 0.535  | 0.483  | 0.365  | 0.517  | 0.558  | 0.326  | 0.280  |
| Item46                         | 0.752  | 1.000  | 0.568  | 0.611  | 0.601  | 0.525  | 0.411  | 0.445  | 0.437  | 0.305  | 0.223  |
| Item47                         | 0.484  | 0.568  | 1.000  | 0.846  | 0.575  | 0.592  | 0.545  | 0.554  | 0.496  | 0.465  | 0.239  |
| Item48                         | 0.511  | 0.611  | 0.846  | 1.000  | 0.603  | 0.613  | 0.603  | 0.527  | 0.484  | 0.486  | 0.300  |
| Item49                         | 0.535  | 0.601  | 0.575  | 0.603  | 1.000  | 0.705  | 0.438  | 0.482  | 0.502  | 0.482  | 0.237  |
| Item50                         | 0.483  | 0.525  | 0.592  | 0.613  | 0.705  | 1.000  | 0.398  | 0.446  | 0.425  | 0.405  | 0.192  |
| Item51                         | 0.365  | 0.411  | 0.545  | 0.603  | 0.438  | 0.398  | 1.000  | 0.474  | 0.453  | 0.457  | 0.427  |
| Item52                         | 0.517  | 0.445  | 0.554  | 0.527  | 0.482  | 0.446  | 0.474  | 1.000  | 0.689  | 0.526  | 0.285  |
| Item53                         | 0.558  | 0.437  | 0.496  | 0.484  | 0.502  | 0.425  | 0.453  | 0.689  | 1.000  | 0.657  | 0.345  |
| Item54                         | 0.326  | 0.305  | 0.465  | 0.486  | 0.482  | 0.405  | 0.457  | 0.526  | 0.657  | 1.000  | 0.319  |
| Item55                         | 0.280  | 0.223  | 0.239  | 0.300  | 0.237  | 0.192  | 0.427  | 0.285  | 0.345  | 0.319  | 1.000  |
| Item                           | 45     | 46     | 47     | 48     | 49     | 50     | 51     | 52     | 53     | 54     | 55     |
| Number of item correlation <.3 | 18     | 19     | 8      | 10     | 21     | 22     | 8      | 10     | 11     | 21     | 27     |
| %                              | 32.73  | 34.55  | 14.55  | 18.18  | 38.18  | 40.00  | 14.55  | 18.18  | 20.00  | 38.18  | 49.09  |
| Average correlation            | 0.374  | 0.357  | 0.444  | 0.439  | 0.369  | 0.357  | 0.417  | 0.395  | 0.395  | 0.330  | 0.312  |

## 4. Item total correlation after delete 12 items (43 items)

| Item-Total Statistics |      |                |                                  |                                  |
|-----------------------|------|----------------|----------------------------------|----------------------------------|
|                       | Mean | Std. Deviation | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
| Item1                 | 3.51 | .667           | .515                             | .961                             |
| Item3                 | 2.86 | .956           | .575                             | .961                             |
| Item4                 | 2.53 | 1.078          | .636                             | .961                             |
| Item6                 | 2.98 | .843           | .580                             | .961                             |
| Item7                 | 2.90 | 1.116          | .699                             | .960                             |
| Item8                 | 2.75 | 1.018          | .634                             | .961                             |
| Item9                 | 3.40 | .822           | .612                             | .961                             |
| Item11                | 3.11 | .922           | .645                             | .961                             |
| Item12                | 3.29 | .865           | .595                             | .961                             |
| Item13                | 2.97 | 1.017          | .678                             | .960                             |
| Item14                | 3.21 | .901           | .541                             | .961                             |
| Item16                | 3.40 | .876           | .588                             | .961                             |
| Item18                | 3.22 | 1.028          | .575                             | .961                             |
| Item19                | 3.47 | .709           | .727                             | .960                             |
| Item20                | 3.23 | .894           | .686                             | .960                             |
| Item21                | 3.24 | .823           | .706                             | .960                             |
| Item22                | 3.12 | .909           | .687                             | .960                             |
| Item23                | 3.66 | .574           | .456                             | .961                             |
| Item24                | 3.69 | .557           | .606                             | .961                             |
| Item25                | 3.48 | .774           | .680                             | .960                             |
| Item26                | 3.61 | .544           | .549                             | .961                             |
| Item27                | 3.25 | .845           | .604                             | .961                             |
| Item28                | 3.00 | 1.043          | .505                             | .961                             |
| Item29                | 3.54 | .640           | .697                             | .961                             |
| Item31                | 3.55 | .665           | .555                             | .961                             |
| Item33                | 3.51 | .663           | .608                             | .961                             |
| Item34                | 3.55 | .630           | .552                             | .961                             |
| Item35                | 3.72 | .542           | .483                             | .961                             |
| Item36                | 3.32 | .837           | .501                             | .961                             |
| Item37                | 3.25 | .788           | .520                             | .961                             |
| Item38                | 3.10 | .987           | .567                             | .961                             |
| Item39                | 2.92 | 1.034          | .563                             | .961                             |
| Item40                | 2.52 | 1.040          | .682                             | .960                             |
| Item41                | 3.04 | .921           | .681                             | .960                             |
| Item42                | 3.06 | .964           | .675                             | .960                             |
| Item46                | 2.66 | 1.030          | .554                             | .961                             |
| Item48                | 3.22 | .960           | .695                             | .960                             |
| Item50                | 3.05 | .959           | .558                             | .961                             |
| Item51                | 2.88 | 1.135          | .680                             | .960                             |
| Item52                | 3.07 | 1.043          | .641                             | .961                             |
| Item53                | 2.83 | 1.161          | .643                             | .961                             |
| Item54                | 2.65 | 1.087          | .526                             | .961                             |
| Item55                | 2.89 | 1.056          | .502                             | .961                             |

## 5. Descriptive statistic (43 items)

| Descriptive Statistics |           |           |           |           |            |                |           |           |            |           |            |
|------------------------|-----------|-----------|-----------|-----------|------------|----------------|-----------|-----------|------------|-----------|------------|
|                        | N         | Minimum   | Maximum   | Mean      |            | Std. Deviation | Variance  | Skewness  |            | Kurtosis  |            |
|                        | Statistic | Statistic | Statistic | Statistic | Std. Error | Statistic      | Statistic | Statistic | Std. Error | Statistic | Std. Error |
| Item1                  | 350       | 1         | 4         | 3.51      | .036       | .667           | .446      | -1.300    | .130       | 1.599     | .260       |
| Item3                  | 350       | 1         | 4         | 2.86      | .051       | .956           | .914      | -.463     | .130       | -1.712    | .260       |
| Item4                  | 350       | 1         | 4         | 2.53      | .058       | 1.078          | 1.161     | .057      | .130       | -1.270    | .260       |
| Item6                  | 350       | 1         | 4         | 2.98      | .045       | .843           | .710      | -.332     | .130       | -.731     | .260       |
| Item7                  | 350       | 1         | 4         | 2.90      | .060       | 1.116          | 1.244     | -.481     | .130       | -1.190    | .260       |
| Item8                  | 350       | 1         | 4         | 2.75      | .054       | 1.018          | 1.037     | -.348     | .130       | -.984     | .260       |
| Item9                  | 350       | 1         | 4         | 3.40      | .044       | .822           | .676      | -1.262    | .130       | .813      | .260       |
| Item11                 | 350       | 1         | 4         | 3.11      | .049       | .922           | .850      | -.841     | .130       | -.134     | .260       |
| Item12                 | 350       | 1         | 4         | 3.29      | .046       | .865           | .749      | -1.148    | .130       | .646      | .260       |
| Item13                 | 350       | 1         | 4         | 2.97      | .054       | 1.017          | 1.034     | -.524     | .130       | -.953     | .260       |
| Item14                 | 350       | 1         | 4         | 3.21      | .048       | .901           | .811      | -.985     | .130       | .157      | .260       |
| Item16                 | 350       | 1         | 4         | 3.40      | .047       | .876           | .768      | -1.439    | .130       | 1.222     | .260       |
| Item18                 | 350       | 1         | 4         | 3.22      | .055       | 1.028          | 1.056     | -1.063    | .130       | -.183     | .260       |
| Item19                 | 350       | 1         | 4         | 3.47      | .038       | .709           | .502      | -1.211    | .130       | .952      | .260       |
| Item20                 | 350       | 1         | 4         | 3.23      | .048       | .894           | .799      | -.914     | .130       | -.133     | .260       |
| Item21                 | 350       | 1         | 4         | 3.24      | .044       | .823           | .677      | -1.035    | .130       | .677      | .260       |
| Item22                 | 350       | 1         | 4         | 3.12      | .049       | .909           | .826      | -.694     | .130       | -.487     | .260       |
| Item23                 | 350       | 1         | 4         | 3.66      | .031       | .574           | .329      | -1.553    | .130       | 1.889     | .260       |
| Item24                 | 350       | 1         | 4         | 3.69      | .030       | .557           | .310      | -1.762    | .130       | 2.666     | .260       |
| Item25                 | 350       | 1         | 4         | 3.48      | .041       | .774           | .600      | -1.543    | .130       | 1.962     | .260       |
| Item26                 | 350       | 1         | 4         | 3.61      | .029       | .544           | .296      | -1.084    | .130       | .790      | .260       |
| Item27                 | 350       | 1         | 4         | 3.25      | .045       | .845           | .715      | -.841     | .130       | -.191     | .260       |
| Item28                 | 350       | 1         | 4         | 3.00      | .056       | 1.043          | 1.089     | -.639     | .130       | -.852     | .260       |
| Item29                 | 350       | 1         | 4         | 3.54      | .034       | .640           | .409      | -1.350    | .130       | 1.799     | .260       |
| Item31                 | 350       | 1         | 4         | 3.55      | .036       | .665           | .443      | -1.433    | .130       | 1.690     | .260       |
| Item33                 | 350       | 1         | 4         | 3.51      | .035       | .663           | .440      | -1.355    | .130       | 2.007     | .260       |
| Item34                 | 350       | 1         | 4         | 3.55      | .034       | .630           | .397      | -1.301    | .130       | 1.502     | .260       |
| Item35                 | 350       | 1         | 4         | 3.72      | .029       | .542           | .294      | -1.921    | .130       | 3.344     | .260       |
| Item36                 | 350       | 1         | 4         | 3.32      | .045       | .837           | .701      | -1.079    | .130       | .394      | .260       |
| Item37                 | 350       | 1         | 4         | 3.25      | .042       | .788           | .621      | -.818     | .130       | .106      | .260       |
| Item38                 | 350       | 1         | 4         | 3.10      | .053       | .987           | .975      | -.782     | .130       | -.531     | .260       |
| Item39                 | 350       | 1         | 4         | 2.92      | .055       | 1.034          | 1.069     | -.440     | .130       | -1.071    | .260       |
| Item40                 | 350       | 1         | 4         | 2.52      | .056       | 1.040          | 1.081     | -.007     | .130       | -1.165    | .260       |
| Item41                 | 350       | 1         | 4         | 3.04      | .049       | .921           | .849      | -.660     | .130       | -.453     | .260       |
| Item42                 | 350       | 1         | 4         | 3.06      | .052       | .964           | .930      | -.570     | .130       | -.873     | .260       |
| Item46                 | 350       | 1         | 4         | 2.66      | .055       | 1.030          | 1.061     | -.222     | .130       | -1.090    | .260       |
| Item48                 | 350       | 1         | 4         | 3.22      | .051       | .960           | .921      | -1.072    | .130       | .121      | .260       |
| Item50                 | 350       | 1         | 4         | 3.05      | .051       | .959           | .920      | -.632     | .130       | -.681     | .260       |
| Item51                 | 350       | 1         | 4         | 2.88      | .061       | 1.135          | 1.289     | -.490     | .130       | -1.207    | .260       |
| Item52                 | 350       | 1         | 4         | 3.07      | .056       | 1.043          | 1.087     | -.757     | .130       | -.705     | .260       |
| Item53                 | 350       | 1         | 4         | 2.83      | .062       | 1.161          | 1.348     | -.452     | .130       | -1.280    | .260       |
| Item54                 | 350       | 1         | 4         | 2.65      | .058       | 1.087          | 1.181     | -.176     | .130       | -1.259    | .260       |
| Item55                 | 350       | 1         | 4         | 2.89      | .056       | 1.056          | 1.115     | -.463     | .130       | -1.059    | .260       |

## 6. Communalities of 43 items

| <b>Communalities</b> |         |            |
|----------------------|---------|------------|
|                      | Initial | Extraction |
| Item1                | 1.000   | .577       |
| Item3                | 1.000   | .772       |
| Item4                | 1.000   | .704       |
| Item6                | 1.000   | .644       |
| Item7                | 1.000   | .763       |
| Item8                | 1.000   | .650       |
| Item9                | 1.000   | .703       |
| Item11               | 1.000   | .679       |
| Item12               | 1.000   | .641       |
| Item13               | 1.000   | .741       |
| Item14               | 1.000   | .668       |
| Item16               | 1.000   | .649       |
| Item18               | 1.000   | .751       |
| Item19               | 1.000   | .719       |
| Item20               | 1.000   | .707       |
| Item21               | 1.000   | .710       |
| Item22               | 1.000   | .713       |
| Item23               | 1.000   | .623       |
| Item24               | 1.000   | .725       |
| Item25               | 1.000   | .637       |
| Item26               | 1.000   | .701       |
| Item27               | 1.000   | .658       |
| Item28               | 1.000   | .776       |
| Item29               | 1.000   | .679       |
| Item31               | 1.000   | .640       |
| Item33               | 1.000   | .766       |
| Item34               | 1.000   | .701       |
| Item35               | 1.000   | .703       |
| Item36               | 1.000   | .783       |
| Item37               | 1.000   | .565       |
| Item38               | 1.000   | .704       |
| Item39               | 1.000   | .679       |
| Item40               | 1.000   | .696       |
| Item41               | 1.000   | .764       |
| Item42               | 1.000   | .761       |
| Item46               | 1.000   | .664       |
| Item48               | 1.000   | .788       |
| Item50               | 1.000   | .662       |
| Item51               | 1.000   | .682       |
| Item52               | 1.000   | .710       |
| Item53               | 1.000   | .751       |
| Item54               | 1.000   | .668       |
| Item55               | 1.000   | .675       |

Extraction Method: Principal Component Analysis.



## 7. Total variance explained

| Total Variance Explained |                     |               |              |                            |               |              |                          |               |              |
|--------------------------|---------------------|---------------|--------------|----------------------------|---------------|--------------|--------------------------|---------------|--------------|
| Component                | Initial Eigenvalues |               |              | Extraction Sums of Squared |               |              | Rotation Sums of Squared |               |              |
|                          | Total               | % of Variance | Cumulative % | Total                      | % of Variance | Cumulative % | Total                    | % of Variance | Cumulative % |
| 1                        | 17.151              | 39.887        | 39.887       | 17.151                     | 39.887        | 39.887       | 4.244                    | 9.869         | 9.869        |
| 2                        | 2.615               | 6.083         | 45.970       | 2.615                      | 6.083         | 45.970       | 4.173                    | 9.704         | 19.573       |
| 3                        | 2.138               | 4.973         | 50.943       | 2.138                      | 4.973         | 50.943       | 3.894                    | 9.055         | 28.627       |
| 4                        | 1.828               | 4.251         | 55.194       | 1.828                      | 4.251         | 55.194       | 3.819                    | 8.882         | 37.509       |
| 5                        | 1.482               | 3.446         | 58.640       | 1.482                      | 3.446         | 58.640       | 3.680                    | 8.558         | 46.068       |
| 6                        | 1.424               | 3.312         | 61.951       | 1.424                      | 3.312         | 61.951       | 3.280                    | 7.627         | 53.695       |
| 7                        | 1.205               | 2.803         | 64.754       | 1.205                      | 2.803         | 64.754       | 2.868                    | 6.670         | 60.365       |
| 8                        | 1.072               | 2.492         | 67.246       | 1.072                      | 2.492         | 67.246       | 2.781                    | 6.467         | 66.831       |
| 9                        | 1.037               | 2.412         | 69.658       | 1.037                      | 2.412         | 69.658       | 1.216                    | 2.827         | 69.658       |
| 10                       | .802                | 1.866         | 71.524       |                            |               |              |                          |               |              |
| 11                       | .751                | 1.747         | 73.271       |                            |               |              |                          |               |              |
| 12                       | .710                | 1.652         | 74.923       |                            |               |              |                          |               |              |
| 13                       | .687                | 1.597         | 76.520       |                            |               |              |                          |               |              |
| 14                       | .656                | 1.525         | 78.045       |                            |               |              |                          |               |              |
| 15                       | .637                | 1.481         | 79.526       |                            |               |              |                          |               |              |
| 16                       | .583                | 1.357         | 80.882       |                            |               |              |                          |               |              |
| 17                       | .573                | 1.332         | 82.214       |                            |               |              |                          |               |              |
| 18                       | .525                | 1.222         | 83.436       |                            |               |              |                          |               |              |
| 19                       | .513                | 1.193         | 84.629       |                            |               |              |                          |               |              |
| 20                       | .492                | 1.144         | 85.773       |                            |               |              |                          |               |              |
| 21                       | .473                | 1.099         | 86.872       |                            |               |              |                          |               |              |
| 22                       | .421                | .979          | 87.850       |                            |               |              |                          |               |              |
| 23                       | .398                | .925          | 88.776       |                            |               |              |                          |               |              |
| 24                       | .384                | .893          | 89.669       |                            |               |              |                          |               |              |
| 25                       | .364                | .847          | 90.515       |                            |               |              |                          |               |              |
| 26                       | .338                | .785          | 91.300       |                            |               |              |                          |               |              |
| 27                       | .326                | .759          | 92.059       |                            |               |              |                          |               |              |
| 28                       | .303                | .704          | 92.763       |                            |               |              |                          |               |              |
| 29                       | .292                | .679          | 93.442       |                            |               |              |                          |               |              |
| 30                       | .284                | .661          | 94.103       |                            |               |              |                          |               |              |
| 31                       | .271                | .631          | 94.734       |                            |               |              |                          |               |              |
| 32                       | .259                | .602          | 95.337       |                            |               |              |                          |               |              |
| 33                       | .252                | .587          | 95.923       |                            |               |              |                          |               |              |
| 34                       | .235                | .547          | 96.470       |                            |               |              |                          |               |              |
| 35                       | .211                | .490          | 96.960       |                            |               |              |                          |               |              |
| 36                       | .195                | .453          | 97.412       |                            |               |              |                          |               |              |
| 37                       | .185                | .430          | 97.842       |                            |               |              |                          |               |              |
| 38                       | .177                | .412          | 98.254       |                            |               |              |                          |               |              |
| 39                       | .171                | .397          | 98.651       |                            |               |              |                          |               |              |
| 40                       | .166                | .385          | 99.036       |                            |               |              |                          |               |              |
| 41                       | .152                | .354          | 99.390       |                            |               |              |                          |               |              |
| 42                       | .148                | .343          | 99.734       |                            |               |              |                          |               |              |
| 43                       | .114                | .266          | 100.000      |                            |               |              |                          |               |              |

Extraction Method: Principal Component Analysis.

## 8. Rotated component matrix

| Rotated Component Matrix <sup>a</sup> |           |      |      |      |      |      |      |      |      |
|---------------------------------------|-----------|------|------|------|------|------|------|------|------|
|                                       | Component |      |      |      |      |      |      |      |      |
|                                       | 1         | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    |
| Item18                                | .793      |      |      |      |      |      |      |      |      |
| Item53                                | .741      |      |      |      |      |      |      |      |      |
| Item54                                | .728      |      |      |      |      |      |      |      |      |
| Item52                                | .701      |      |      |      |      |      |      |      |      |
| Item51                                | .352      |      |      |      |      | .395 |      |      |      |
| Item25                                | .339      |      |      |      |      | .359 |      |      |      |
| Item35                                |           | .723 |      |      |      |      |      |      |      |
| Item34                                |           | .703 |      | .348 |      |      |      |      |      |
| Item33                                |           | .667 |      |      |      |      | .460 |      |      |
| Item31                                |           | .608 |      |      |      |      |      |      |      |
| Item37                                |           | .599 |      |      |      | .303 |      |      |      |
| Item48                                | .372      |      | .699 |      |      |      |      |      |      |
| Item42                                |           |      | .664 | .395 |      |      |      |      |      |
| Item41                                |           |      | .654 |      |      | .390 |      |      |      |
| Item50                                | .379      |      | .604 |      |      |      |      |      |      |
| Item46                                |           |      | .545 |      |      |      | .437 |      |      |
| Item39                                |           |      | .506 |      |      | .534 |      |      |      |
| Item40                                | .336      |      | .469 |      |      |      |      |      |      |
| Item26                                |           |      |      | .727 |      |      |      |      |      |
| Item24                                |           |      |      | .624 |      |      |      |      |      |
| Item1                                 |           |      |      | .578 |      |      |      |      |      |
| Item9                                 | .351      |      |      | .526 |      |      |      |      |      |
| Item16                                |           |      |      | .500 | .370 |      |      |      |      |
| Item29                                |           |      |      | .488 | .343 |      |      |      |      |
| Item23                                |           |      |      | .431 |      |      | .332 |      |      |
| Item13                                |           |      |      |      | .666 |      | .314 |      |      |
| Item12                                |           |      |      |      | .654 |      |      |      |      |
| Item14                                |           | .353 |      |      | .647 |      |      |      |      |
| Item11                                |           |      | .339 |      | .548 |      |      |      |      |
| Item21                                |           |      |      |      | .504 | .425 |      |      |      |
| Item55                                |           |      |      |      |      | .715 |      |      |      |
| Item22                                |           |      |      |      |      | .587 |      |      |      |
| Item19                                |           | .419 |      |      |      | .484 |      |      |      |
| Item20                                |           | .445 |      |      |      | .451 |      |      |      |
| Item28                                |           |      |      |      |      |      | .806 |      |      |
| Item27                                |           |      |      | .341 |      |      | .627 |      |      |
| Item36                                |           |      |      |      |      |      | .472 |      | .579 |
| Item3                                 |           |      |      |      |      |      |      | .751 |      |
| Item4                                 |           |      |      |      | .375 |      |      | .607 |      |
| Item7                                 |           |      |      | .505 |      |      |      | .536 |      |
| Item8                                 | .376      |      |      |      |      |      |      | .508 |      |
| Item38                                |           |      |      |      |      |      | .401 | .491 |      |
| Item6                                 |           |      |      |      | .473 |      |      | .404 |      |

Extraction Method: Principal Component Analysis.  
a. Rotation converged in 14 iterations.

## 9. Statistical analysis by component

## 9.1 Component 1

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .863             | .864   | 6          |

**Item Statistics**

|        | Mean | Std. Deviation | N   |
|--------|------|----------------|-----|
| Item18 | 3.22 | 1.028          | 350 |
| Item51 | 2.88 | 1.135          | 350 |
| Item52 | 3.07 | 1.043          | 350 |
| Item53 | 2.83 | 1.161          | 350 |
| Item54 | 2.65 | 1.087          | 350 |
| Item25 | 3.48 | .774           | 350 |

**Item-Total Statistics**

|        | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|--------|----------------------------|--------------------------------|----------------------------------|------------------------------|----------------------------------|
| Item18 | 14.89                      | 16.452                         | .702                             | .548                         | .832                             |
| Item51 | 15.24                      | 16.823                         | .564                             | .359                         | .858                             |
| Item52 | 15.05                      | 16.121                         | .735                             | .588                         | .826                             |
| Item53 | 15.29                      | 15.192                         | .754                             | .619                         | .821                             |
| Item54 | 15.47                      | 16.445                         | .651                             | .473                         | .841                             |
| Item25 | 14.64                      | 18.977                         | .561                             | .355                         | .857                             |

**Scale Statistics**

| Mean  | Variance | Std. Deviation | N of Items |
|-------|----------|----------------|------------|
| 18.11 | 23.362   | 4.833          | 6          |

## 9.2 Component 2

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .821             | .828   | 5          |

**Item Statistics**

|        | Mean | Std. Deviation | N   |
|--------|------|----------------|-----|
| Item31 | 3.55 | .665           | 350 |
| Item33 | 3.51 | .663           | 350 |
| Item34 | 3.55 | .630           | 350 |
| Item35 | 3.72 | .542           | 350 |
| Item37 | 3.25 | .788           | 350 |

**Item-Total Statistics**

|        | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|--------|----------------------------|--------------------------------|----------------------------------|------------------------------|----------------------------------|
| Item31 | 14.02                      | 4.297                          | .597                             | .374                         | .790                             |
| Item33 | 14.07                      | 4.049                          | .711                             | .551                         | .755                             |
| Item34 | 14.03                      | 4.203                          | .692                             | .557                         | .763                             |
| Item35 | 13.86                      | 4.702                          | .592                             | .385                         | .794                             |
| Item37 | 14.33                      | 4.108                          | .519                             | .282                         | .823                             |

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**Scale Statistics**

| Mean  | Variance | Std. Deviation | N of Items |
|-------|----------|----------------|------------|
| 17.58 | 6.388    | 2.527          | 5          |

## 9.3 Component 3

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .884             | .885   | 7          |

**Item Statistics**

|        | Mean | Std. Deviation | N   |
|--------|------|----------------|-----|
| Item39 | 2.92 | 1.034          | 350 |
| Item40 | 2.52 | 1.040          | 350 |
| Item41 | 3.04 | .921           | 350 |
| Item42 | 3.06 | .964           | 350 |
| Item46 | 2.66 | 1.030          | 350 |
| Item48 | 3.22 | .960           | 350 |
| Item50 | 3.05 | .959           | 350 |

**Item-Total Statistics**

|        | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|--------|----------------------------|--------------------------------|----------------------------------|------------------------------|----------------------------------|
| Item39 | 17.55                      | 21.698                         | .563                             | .416                         | .881                             |
| Item40 | 17.96                      | 20.554                         | .695                             | .525                         | .864                             |
| Item41 | 17.43                      | 21.123                         | .734                             | .615                         | .860                             |
| Item42 | 17.41                      | 21.235                         | .678                             | .585                         | .867                             |
| Item46 | 17.81                      | 21.023                         | .646                             | .510                         | .871                             |
| Item48 | 17.26                      | 20.611                         | .764                             | .647                         | .856                             |
| Item50 | 17.43                      | 21.523                         | .645                             | .489                         | .870                             |

**Scale Statistics**

| Mean  | Variance | Std. Deviation | N of Items |
|-------|----------|----------------|------------|
| 20.48 | 28.187   | 5.309          | 7          |

## 9.4 Component 4

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .849             | .859   | 7          |

**Item Statistics**

|        | Mean | Std. Deviation | N   |
|--------|------|----------------|-----|
| Item1  | 3.51 | .667           | 350 |
| Item9  | 3.40 | .822           | 350 |
| Item16 | 3.40 | .876           | 350 |
| Item23 | 3.66 | .574           | 350 |
| Item24 | 3.69 | .557           | 350 |
| Item26 | 3.61 | .544           | 350 |
| Item29 | 3.54 | .640           | 350 |

**Item-Total Statistics**

|        | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|--------|----------------------------|--------------------------------|----------------------------------|------------------------------|----------------------------------|
| Item1  | 21.30                      | 9.048                          | .597                             | .379                         | .830                             |
| Item9  | 21.41                      | 8.374                          | .597                             | .390                         | .833                             |
| Item16 | 21.41                      | 8.007                          | .628                             | .452                         | .830                             |
| Item23 | 21.15                      | 9.751                          | .506                             | .369                         | .842                             |
| Item24 | 21.11                      | 9.334                          | .660                             | .490                         | .824                             |
| Item26 | 21.20                      | 9.387                          | .662                             | .486                         | .824                             |
| Item29 | 21.27                      | 8.792                          | .709                             | .529                         | .814                             |

**Scale Statistics**

| Mean  | Variance | Std. Deviation | N of Items |
|-------|----------|----------------|------------|
| 24.81 | 11.892   | 3.448          | 7          |

## 9.5 Component 5

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .853             | .853   | 5          |

**Item Statistics**

|        | Mean | Std. Deviation | N   |
|--------|------|----------------|-----|
| Item11 | 3.11 | .922           | 350 |
| Item12 | 3.29 | .865           | 350 |
| Item13 | 2.97 | 1.017          | 350 |
| Item14 | 3.21 | .901           | 350 |
| Item21 | 3.24 | .823           | 350 |

**Item-Total Statistics**

|        | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|--------|----------------------------|--------------------------------|----------------------------------|------------------------------|----------------------------------|
| Item11 | 12.71                      | 8.396                          | .696                             | .508                         | .814                             |
| Item12 | 12.53                      | 8.760                          | .675                             | .476                         | .820                             |
| Item13 | 12.85                      | 7.810                          | .726                             | .529                         | .806                             |
| Item14 | 12.61                      | 9.051                          | .573                             | .343                         | .846                             |
| Item21 | 12.58                      | 9.007                          | .665                             | .454                         | .823                             |

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**Scale Statistics**

| Mean  | Variance | Std. Deviation | N of Items |
|-------|----------|----------------|------------|
| 15.82 | 12.968   | 3.601          | 5          |

## 9.6 Component 6

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .802             | .817   | 4          |

**Item Statistics**

|        | Mean | Std. Deviation | N   |
|--------|------|----------------|-----|
| Item19 | 3.47 | .709           | 350 |
| Item20 | 3.23 | .894           | 350 |
| Item22 | 3.12 | .909           | 350 |
| Item55 | 2.89 | 1.056          | 350 |

**Item-Total Statistics**

|        | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|--------|----------------------------|--------------------------------|----------------------------------|------------------------------|----------------------------------|
| Item19 | 9.25                       | 5.355                          | .693                             | .500                         | .733                             |
| Item20 | 9.48                       | 4.852                          | .629                             | .494                         | .745                             |
| Item22 | 9.60                       | 4.562                          | .706                             | .513                         | .706                             |
| Item55 | 9.82                       | 4.731                          | .497                             | .282                         | .826                             |

**Scale Statistics**

| Mean  | Variance | Std. Deviation | N of Items |
|-------|----------|----------------|------------|
| 12.72 | 8.129    | 2.851          | 4          |



## 9.7 Component 7

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .765             | .765   | 3          |

**Item Statistics**

|        | Mean | Std. Deviation | N   |
|--------|------|----------------|-----|
| Item27 | 3.25 | .845           | 350 |
| Item28 | 3.00 | 1.043          | 350 |
| Item36 | 3.32 | .837           | 350 |

**Item-Total Statistics**

|        | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|--------|----------------------------|--------------------------------|----------------------------------|------------------------------|----------------------------------|
| Item27 | 6.32                       | 2.620                          | .649                             | .474                         | .634                             |
| Item28 | 6.57                       | 1.988                          | .691                             | .513                         | .576                             |
| Item36 | 6.25                       | 3.007                          | .483                             | .238                         | .800                             |

**Scale Statistics**

| Mean | Variance | Std. Deviation | N of Items |
|------|----------|----------------|------------|
| 9.57 | 5.111    | 2.261          | 3          |

## 9.8 Component 8

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .846             | .846   | 6          |

**Item Statistics**

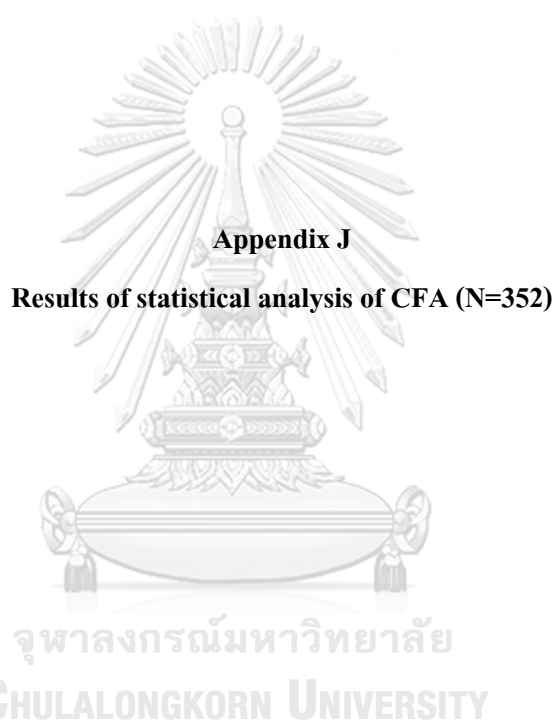
|        | Mean | Std. Deviation | N   |
|--------|------|----------------|-----|
| Item3  | 2.86 | .956           | 350 |
| Item4  | 2.53 | 1.078          | 350 |
| Item6  | 2.98 | .843           | 350 |
| Item7  | 2.90 | 1.116          | 350 |
| Item8  | 2.75 | 1.018          | 350 |
| Item38 | 3.10 | .987           | 350 |

**Item-Total Statistics**

|        | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|--------|----------------------------|--------------------------------|----------------------------------|------------------------------|----------------------------------|
| Item3  | 14.25                      | 14.568                         | .685                             | .511                         | .810                             |
| Item4  | 14.58                      | 13.997                         | .660                             | .493                         | .814                             |
| Item6  | 14.13                      | 15.927                         | .572                             | .374                         | .832                             |
| Item7  | 14.21                      | 13.493                         | .701                             | .509                         | .806                             |
| Item8  | 14.36                      | 14.547                         | .631                             | .421                         | .820                             |
| Item38 | 14.01                      | 15.441                         | .524                             | .347                         | .840                             |

**Scale Statistics**

| Mean  | Variance | Std. Deviation | N of Items |
|-------|----------|----------------|------------|
| 17.11 | 20.483   | 4.526          | 6          |



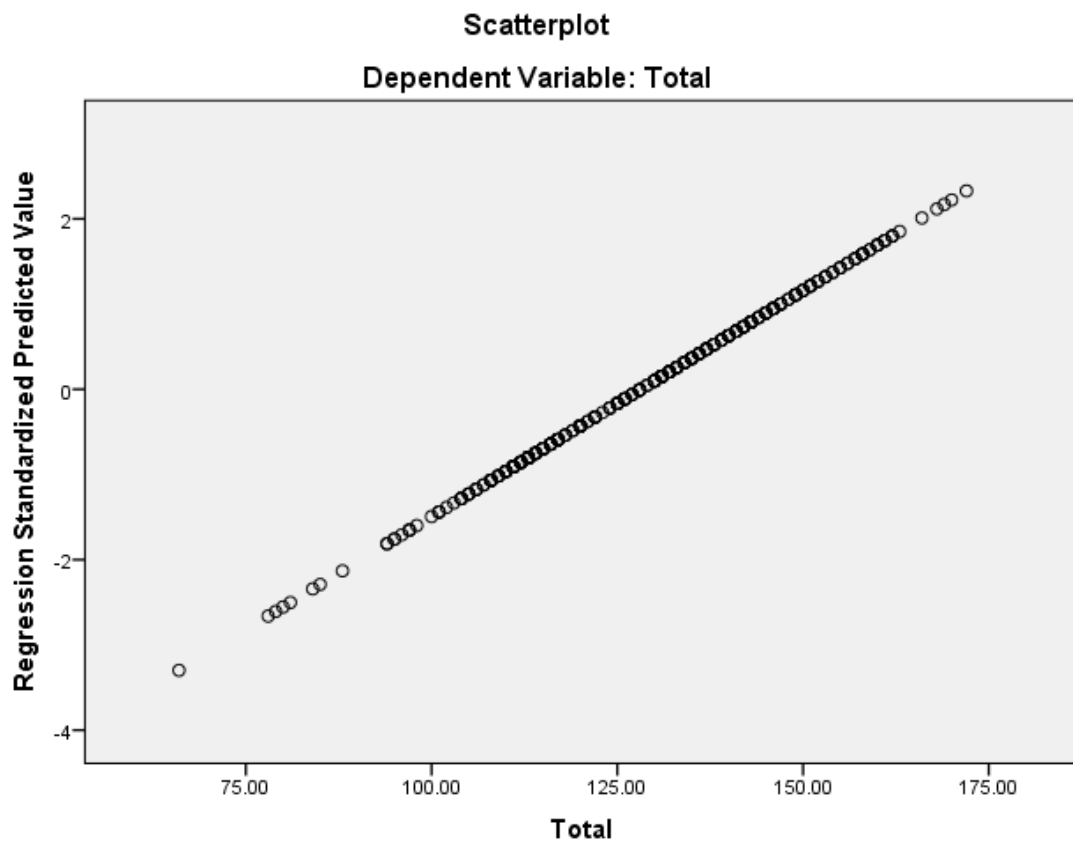
## 1. Testing assumption for CFA

## 1.1 Normality testing (43 items)

| Descriptive Statistics |           |           |           |           |           |                   |           |           |               |           |               |
|------------------------|-----------|-----------|-----------|-----------|-----------|-------------------|-----------|-----------|---------------|-----------|---------------|
|                        | N         | Range     | Minimum   | Maximum   | Mean      | Std.<br>Deviation | Variance  | Skewness  |               | Kurtosis  |               |
|                        | Statistic | Statistic | Statistic | Statistic | Statistic | Statistic         | Statistic | Statistic | Std.<br>Error | Statistic | Std.<br>Error |
| Item18                 | 352       | 3         | 1         | 4         | 2.97      | .907              | .822      | -.330     | .130          | -.966     | .259          |
| Item53                 | 352       | 3         | 1         | 4         | 2.44      | 1.028             | 1.056     | .098      | .130          | -1.122    | .259          |
| Item54                 | 352       | 3         | 1         | 4         | 2.65      | .881              | .776      | -.255     | .130          | -.608     | .259          |
| Item52                 | 352       | 3         | 1         | 4         | 2.83      | .920              | .846      | -.103     | .130          | -1.093    | .259          |
| Item51                 | 352       | 3         | 1         | 4         | 2.80      | .947              | .897      | -.296     | .130          | -.859     | .259          |
| Item25                 | 352       | 3         | 1         | 4         | 3.06      | .854              | .729      | -.446     | .130          | -.740     | .259          |
| Item35                 | 352       | 3         | 1         | 4         | 3.49      | .618              | .382      | -.868     | .130          | .111      | .259          |
| Item34                 | 352       | 3         | 1         | 4         | 3.30      | .688              | .473      | -.789     | .130          | .660      | .259          |
| Item33                 | 352       | 3         | 1         | 4         | 3.25      | .668              | .446      | -.572     | .130          | .263      | .259          |
| Item31                 | 352       | 3         | 1         | 4         | 3.35      | .641              | .411      | -.608     | .130          | .024      | .259          |
| Item37                 | 352       | 3         | 1         | 4         | 3.07      | .758              | .574      | -.426     | .130          | -.293     | .259          |
| Item48                 | 352       | 3         | 1         | 4         | 2.98      | .860              | .740      | -.669     | .130          | -.058     | .259          |
| Item42                 | 352       | 3         | 1         | 4         | 2.92      | .797              | .635      | -.371     | .130          | -.317     | .259          |
| Item41                 | 352       | 3         | 1         | 4         | 2.89      | .800              | .640      | -.368     | .130          | -.287     | .259          |
| Item50                 | 352       | 3         | 1         | 4         | 3.07      | .797              | .636      | -.603     | .130          | -.041     | .259          |
| Item46                 | 352       | 3         | 1         | 4         | 2.43      | .970              | .942      | .204      | .130          | -.932     | .259          |
| Item39                 | 352       | 3         | 1         | 4         | 2.59      | .911              | .830      | -.016     | .130          | -.816     | .259          |
| Item40                 | 352       | 3         | 1         | 4         | 2.06      | .954              | .911      | .533      | .130          | -.680     | .259          |
| Item26                 | 352       | 3         | 1         | 4         | 3.49      | .570              | .325      | -.756     | .130          | .638      | .259          |
| Item24                 | 352       | 3         | 1         | 4         | 3.53      | .584              | .341      | -.974     | .130          | .888      | .259          |
| Item1                  | 352       | 3         | 1         | 4         | 3.49      | .627              | .393      | -1.199    | .130          | 1.936     | .259          |
| Item9                  | 352       | 3         | 1         | 4         | 3.26      | .786              | .618      | -.874     | .130          | .289      | .259          |
| Item16                 | 352       | 3         | 1         | 4         | 3.35      | .736              | .541      | -1.045    | .130          | .925      | .259          |
| Item29                 | 352       | 3         | 1         | 4         | 3.39      | .641              | .411      | -.908     | .130          | 1.227     | .259          |
| Item23                 | 352       | 3         | 1         | 4         | 3.45      | .620              | .385      | -.813     | .130          | .380      | .259          |
| Item13                 | 352       | 3         | 1         | 4         | 2.90      | .827              | .685      | -.414     | .130          | -.334     | .259          |
| Item12                 | 352       | 3         | 1         | 4         | 3.13      | .756              | .572      | -.624     | .130          | .127      | .259          |
| Item14                 | 352       | 3         | 1         | 4         | 3.10      | .765              | .586      | -.631     | .130          | .187      | .259          |
| Item11                 | 352       | 3         | 1         | 4         | 2.91      | .839              | .704      | -.409     | .130          | -.411     | .259          |
| Item21                 | 352       | 3         | 1         | 4         | 3.05      | .728              | .530      | -.529     | .130          | .269      | .259          |
| Item55                 | 352       | 3         | 1         | 4         | 2.84      | .895              | .801      | -.258     | .130          | -.793     | .259          |
| Item22                 | 352       | 3         | 1         | 4         | 3.04      | .717              | .514      | -.436     | .130          | .098      | .259          |
| Item19                 | 352       | 3         | 1         | 4         | 3.26      | .604              | .365      | -.346     | .130          | .240      | .259          |
| Item20                 | 352       | 3         | 1         | 4         | 2.82      | .846              | .715      | .031      | .130          | -1.035    | .259          |
| Item28                 | 352       | 3         | 1         | 4         | 2.56      | 1.155             | 1.335     | -.125     | .130          | -1.428    | .259          |
| Item27                 | 352       | 3         | 1         | 4         | 2.75      | 1.138             | 1.295     | -.402     | .130          | -1.248    | .259          |
| Item36                 | 352       | 3         | 1         | 4         | 3.14      | .775              | .601      | -.362     | .130          | -.924     | .259          |
| Item3                  | 352       | 3         | 1         | 4         | 2.59      | .859              | .739      | .009      | .130          | -.666     | .259          |
| Item4                  | 352       | 3         | 1         | 4         | 2.42      | .924              | .854      | -.051     | .130          | -.877     | .259          |
| Item7                  | 352       | 3         | 1         | 4         | 2.88      | .837              | .700      | -.471     | .130          | -.248     | .259          |
| Item8                  | 352       | 3         | 1         | 4         | 2.54      | .873              | .762      | -.214     | .130          | -.722     | .259          |
| Item38                 | 352       | 3         | 1         | 4         | 2.99      | .864              | .746      | -.602     | .130          | -.243     | .259          |
| Item6                  | 352       | 3         | 1         | 4         | 3.08      | .705              | .497      | -.411     | .130          | .001      | .259          |

## 1.2 Multicollinearity

|        | Collinearity Statistics |       |
|--------|-------------------------|-------|
|        | Tolerance               | VIF   |
| Item1  | .615                    | 1.625 |
| Item3  | .560                    | 1.785 |
| Item4  | .564                    | 1.774 |
| Item6  | .536                    | 1.865 |
| Item7  | .463                    | 2.160 |
| Item8  | .637                    | 1.570 |
| Item9  | .502                    | 1.992 |
| Item11 | .471                    | 2.121 |
| Item12 | .384                    | 2.602 |
| Item13 | .427                    | 2.342 |
| Item14 | .560                    | 1.785 |
| Item16 | .637                    | 1.570 |
| Item18 | .487                    | 2.053 |
| Item19 | .484                    | 2.067 |
| Item20 | .438                    | 2.283 |
| Item21 | .519                    | 1.926 |
| Item22 | .471                    | 2.124 |
| Item23 | .338                    | 2.960 |
| Item24 | .360                    | 2.780 |
| Item25 | .395                    | 2.531 |
| Item26 | .390                    | 2.561 |
| Item27 | .273                    | 3.657 |
| Item28 | .351                    | 2.850 |
| Item29 | .350                    | 2.858 |
| Item31 | .417                    | 2.400 |
| Item33 | .445                    | 2.245 |
| Item34 | .395                    | 2.530 |
| Item35 | .394                    | 2.540 |
| Item36 | .414                    | 2.418 |
| Item37 | .552                    | 1.812 |
| Item38 | .570                    | 1.754 |
| Item39 | .624                    | 1.603 |
| Item40 | .520                    | 1.924 |
| Item41 | .361                    | 2.767 |
| Item42 | .392                    | 2.550 |
| Item46 | .474                    | 2.112 |
| Item48 | .449                    | 2.227 |
| Item50 | .522                    | 1.917 |
| Item51 | .599                    | 1.669 |
| Item52 | .410                    | 2.438 |
| Item53 | .536                    | 1.867 |
| Item54 | .472                    | 2.117 |
| Item55 | .515                    | 1.943 |



### 1.3 Bartlett's test of sphericity and the Kaiser-Meyer-Olkin

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#### KMO and Bartlett's Test

|  |                    |          |
|--|--------------------|----------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. |                    | .919     |
| Bartlett's Test of Sphericity                    | Approx. Chi-Square | 7616.449 |
|  | df                 | 903      |
|  | Sig.               | .000     |

## 2. Printout of CFA

### 2.1 The hypothesized model

```

#file.choose()
library(foreign)
library(haven)

## Warning: package 'haven' was built under R version 3.5.3

data <- read.spss("G:\\My Drive\\BDMS\\Outsource\\CFA\\CFA352(43item)
).sav", to.data.frame = TRUE, use.value.labels = FALSE)

## re-encoding from CP874

#write.dta(data, file = "CFA352(43item).dta")

library(lavaan)

## Warning: package 'lavaan' was built under R version 3.5.3
## This is lavaan 0.6-3
## lavaan is BETA software! Please report any bugs.

library(dplyr)

## Warning: package 'dplyr' was built under R version 3.5.3
##
## Attaching package: 'dplyr'
## The following objects are masked from 'package:stats':
##
##   filter, lag
## The following objects are masked from 'package:base':
##
##   intersect, setdiff, setequal, union

library(tidyr)

## Warning: package 'tidyr' was built under R version 3.5.3

library(knitr)

## Warning: package 'knitr' was built under R version 3.5.3

CFA352.8factor <- 'Finance =~ Item18 + Item25 + Item51 + Item52 + It
em53 + Item54
Advice =~ Item31 + Item33 + Item34 + Item35 + Item37
F.Support =~ Item39 + Item40 + Item41 + Item42 + Item46 + Item48 + I
tem50
F.Involvement =~ Item11 + Item12 + Item13 + Item14 + Item21
Awareness =~ Item1 + Item9 + Item16 + Item23 + Item24 + Item26 + It

```

```

em29
Consult =~ Item19 + Item20 + Item22 + Item55
Symptom =~ Item3 + Item4 + Item6 + Item7 + Item8 + Item38
Complementary =~ Item27 + Item28 + Item36
'

# fit a full CFA model
CFA352.fit <- cfa(CFA352.8factor, data = data, std.lv = TRUE)
fitMeasures(CFA352.fit)

##           npar           fmin           chisq
##          114.000          3.652          2571.141
##           df           pvalue      baseline.chisq
##          832.000           0.000          7983.097
##      baseline.df      baseline.pvalue           cfi
##          903.000           0.000           0.754
##           tli           nnfi           rfi
##          0.733           0.733           0.650
##           nfi           pnfi           ifi
##          0.678           0.625           0.757
##           rni           logl      unrestricted.logl
##          0.754          -15273.528          -13987.957
##           aic           bic           ntotal
##          30775.055          31215.509          352.000
##           bic2           rmsea      rmsea.ci.lower
##          30853.857           0.077           0.074
##      rmsea.ci.upper      rmsea.pvalue           rmr
##          0.080           0.000           0.058
##           rmr_nomean           srmr      srmr_bentler
##          0.058           0.082           0.082
##      srmr_bentler_nomean           crmr      crmr_nomean
##          0.082           0.084           0.084
##           srmr_mplus      srmr_mplus_nomean           cn_05
##          0.082           0.082           124.243
##           cn_01           gfi           agfi
##          128.297           0.727           0.690
##           pgfi           mfi           ecvi
##          0.640           0.085           7.952

summary(CFA352.fit, fit.measures = TRUE)

## lavaan 0.6-3 ended normally after 45 iterations
##
## Optimization method           NLMINB
## Number of free parameters           114
##
## Number of observations           352
##
## Estimator           ML
## Model Fit Test Statistic           2571.141
## Degrees of freedom           832
## P-value (Chi-square)           0.000
##

```



```

## Model test baseline model:
##
## Minimum Function Test Statistic          7983.097
## Degrees of freedom                       903
## P-value                                  0.000
##
## User model versus baseline model:
##
## Comparative Fit Index (CFI)              0.754
## Tucker-Lewis Index (TLI)                0.733
##
## Loglikelihood and Information Criteria:
##
## Loglikelihood user model (H0)            -15273.528
## Loglikelihood unrestricted model (H1)    -13987.957
##
## Number of free parameters                114
## Akaike (AIC)                            30775.055
## Bayesian (BIC)                          31215.509
## Sample-size adjusted Bayesian (BIC)     30853.857
##
## Root Mean Square Error of Approximation:
##
## RMSEA                                    0.077
## 90 Percent Confidence Interval           0.074 0.080
## P-value RMSEA <= 0.05                   0.000
##
## Standardized Root Mean Square Residual:
##
## SRMR                                     0.082
##
## Parameter Estimates:
##
## Information                               Expected
## Information saturated (h1) model          Structured
## Standard Errors                           Standard
##
## Latent Variables:
##           Estimate  Std.Err  z-value  P(>|z|)
## Finance =~
##   Item18           0.540   0.047   11.538   0.000
##   Item25           0.608   0.042   14.486   0.000
##   Item51           0.445   0.051    8.728   0.000
##   Item52           0.685   0.045   15.376   0.000
##   Item53           0.549   0.054   10.112   0.000
##   Item54           0.416   0.047    8.781   0.000
## Advice =~
##   Item31           0.444   0.032   14.020   0.000
##   Item33           0.467   0.033   14.211   0.000
##   Item34           0.515   0.033   15.579   0.000
##   Item35           0.433   0.030   14.282   0.000

```

|    |                  |          |         |         |         |
|----|------------------|----------|---------|---------|---------|
| ## | Item37           | 0.351    | 0.041   | 8.633   | 0.000   |
| ## | F.Support =~     |          |         |         |         |
| ## | Item39           | 0.479    | 0.048   | 9.948   | 0.000   |
| ## | Item40           | 0.525    | 0.050   | 10.495  | 0.000   |
| ## | Item41           | 0.573    | 0.039   | 14.646  | 0.000   |
| ## | Item42           | 0.534    | 0.040   | 13.430  | 0.000   |
| ## | Item46           | 0.560    | 0.050   | 11.115  | 0.000   |
| ## | Item48           | 0.533    | 0.044   | 12.149  | 0.000   |
| ## | Item50           | 0.450    | 0.042   | 10.843  | 0.000   |
| ## | F.Involvement =~ |          |         |         |         |
| ## | Item11           | 0.596    | 0.041   | 14.484  | 0.000   |
| ## | Item12           | 0.599    | 0.036   | 16.812  | 0.000   |
| ## | Item13           | 0.637    | 0.039   | 16.155  | 0.000   |
| ## | Item14           | 0.471    | 0.039   | 12.014  | 0.000   |
| ## | Item21           | 0.415    | 0.038   | 10.944  | 0.000   |
| ## | Awareness =~     |          |         |         |         |
| ## | Item1            | 0.281    | 0.033   | 8.465   | 0.000   |
| ## | Item9            | 0.469    | 0.040   | 11.828  | 0.000   |
| ## | Item16           | 0.331    | 0.039   | 8.502   | 0.000   |
| ## | Item23           | 0.489    | 0.028   | 17.164  | 0.000   |
| ## | Item24           | 0.452    | 0.027   | 16.715  | 0.000   |
| ## | Item26           | 0.395    | 0.028   | 14.356  | 0.000   |
| ## | Item29           | 0.461    | 0.031   | 15.054  | 0.000   |
| ## | Consult =~       |          |         |         |         |
| ## | Item19           | 0.399    | 0.030   | 13.376  | 0.000   |
| ## | Item20           | 0.557    | 0.042   | 13.307  | 0.000   |
| ## | Item22           | 0.432    | 0.036   | 11.951  | 0.000   |
| ## | Item55           | 0.531    | 0.045   | 11.726  | 0.000   |
| ## | Symptom =~       |          |         |         |         |
| ## | Item3            | 0.499    | 0.046   | 10.853  | 0.000   |
| ## | Item4            | 0.484    | 0.050   | 9.616   | 0.000   |
| ## | Item6            | 0.466    | 0.037   | 12.704  | 0.000   |
| ## | Item7            | 0.610    | 0.042   | 14.421  | 0.000   |
| ## | Item8            | 0.398    | 0.049   | 8.212   | 0.000   |
| ## | Item38           | 0.435    | 0.047   | 9.182   | 0.000   |
| ## | Complementary =~ |          |         |         |         |
| ## | Item27           | 0.984    | 0.052   | 18.936  | 0.000   |
| ## | Item28           | 0.940    | 0.054   | 17.379  | 0.000   |
| ## | Item36           | 0.507    | 0.039   | 13.033  | 0.000   |
| ## |                  |          |         |         |         |
| ## | Covariances:     |          |         |         |         |
| ## |                  | Estimate | Std.Err | z-value | P(> z ) |
| ## | Finance ~~       |          |         |         |         |
| ## | Advice           | 0.705    | 0.041   | 17.135  | 0.000   |
| ## | F.Support        | 0.820    | 0.033   | 24.820  | 0.000   |
| ## | F.Involvement    | 0.549    | 0.050   | 11.013  | 0.000   |
| ## | Awareness        | 0.675    | 0.041   | 16.385  | 0.000   |
| ## | Consult          | 0.843    | 0.036   | 23.205  | 0.000   |
| ## | Symptom          | 0.571    | 0.052   | 11.063  | 0.000   |
| ## | Complementary    | 0.605    | 0.046   | 13.109  | 0.000   |
| ## | Advice ~~        |          |         |         |         |

|    |                  |          |         |         |         |
|----|------------------|----------|---------|---------|---------|
| ## | F.Support        | 0.639    | 0.045   | 14.317  | 0.000   |
| ## | F.Involvement    | 0.458    | 0.054   | 8.555   | 0.000   |
| ## | Awareness        | 0.832    | 0.028   | 29.301  | 0.000   |
| ## | Consult          | 0.817    | 0.037   | 22.094  | 0.000   |
| ## | Symptom          | 0.520    | 0.053   | 9.759   | 0.000   |
| ## | Complementary    | 0.643    | 0.043   | 15.044  | 0.000   |
| ## | F.Support ~~     |          |         |         |         |
| ## | F.Involvement    | 0.661    | 0.042   | 15.707  | 0.000   |
| ## | Awareness        | 0.564    | 0.047   | 11.952  | 0.000   |
| ## | Consult          | 0.744    | 0.042   | 17.601  | 0.000   |
| ## | Symptom          | 0.686    | 0.044   | 15.723  | 0.000   |
| ## | Complementary    | 0.435    | 0.054   | 8.014   | 0.000   |
| ## | F.Involvement ~~ |          |         |         |         |
| ## | Awareness        | 0.581    | 0.045   | 12.897  | 0.000   |
| ## | Consult          | 0.740    | 0.041   | 18.016  | 0.000   |
| ## | Symptom          | 0.617    | 0.047   | 13.220  | 0.000   |
| ## | Complementary    | 0.414    | 0.054   | 7.662   | 0.000   |
| ## | Awareness ~~     |          |         |         |         |
| ## | Consult          | 0.894    | 0.029   | 30.872  | 0.000   |
| ## | Symptom          | 0.550    | 0.050   | 11.049  | 0.000   |
| ## | Complementary    | 0.708    | 0.036   | 19.456  | 0.000   |
| ## | Consult ~~       |          |         |         |         |
| ## | Symptom          | 0.696    | 0.047   | 14.655  | 0.000   |
| ## | Complementary    | 0.692    | 0.044   | 15.707  | 0.000   |
| ## | Symptom ~~       |          |         |         |         |
| ## | Complementary    | 0.296    | 0.061   | 4.832   | 0.000   |
| ## |                  |          |         |         |         |
| ## | Variances:       |          |         |         |         |
| ## |                  | Estimate | Std.Err | z-value | P(> z ) |
| ## | .Item18          | 0.528    | 0.044   | 12.083  | 0.000   |
| ## | .Item25          | 0.357    | 0.032   | 11.001  | 0.000   |
| ## | .Item51          | 0.696    | 0.055   | 12.665  | 0.000   |
| ## | .Item52          | 0.375    | 0.036   | 10.497  | 0.000   |
| ## | .Item53          | 0.752    | 0.061   | 12.416  | 0.000   |
| ## | .Item54          | 0.601    | 0.047   | 12.657  | 0.000   |
| ## | .Item31          | 0.213    | 0.019   | 11.399  | 0.000   |
| ## | .Item33          | 0.227    | 0.020   | 11.321  | 0.000   |
| ## | .Item34          | 0.207    | 0.019   | 10.652  | 0.000   |
| ## | .Item35          | 0.193    | 0.017   | 11.292  | 0.000   |
| ## | .Item37          | 0.449    | 0.035   | 12.722  | 0.000   |
| ## | .Item39          | 0.599    | 0.048   | 12.483  | 0.000   |
| ## | .Item40          | 0.633    | 0.051   | 12.375  | 0.000   |
| ## | .Item41          | 0.310    | 0.028   | 11.057  | 0.000   |
| ## | .Item42          | 0.348    | 0.030   | 11.563  | 0.000   |
| ## | .Item46          | 0.626    | 0.051   | 12.238  | 0.000   |
| ## | .Item48          | 0.454    | 0.038   | 11.974  | 0.000   |
| ## | .Item50          | 0.431    | 0.035   | 12.300  | 0.000   |
| ## | .Item11          | 0.346    | 0.031   | 11.086  | 0.000   |
| ## | .Item12          | 0.212    | 0.022   | 9.644   | 0.000   |
| ## | .Item13          | 0.277    | 0.027   | 10.135  | 0.000   |
| ## | .Item14          | 0.362    | 0.030   | 11.981  | 0.000   |

```

##      .Item21      0.356      0.029      12.254      0.000
##      .Item1      0.313      0.024      12.905      0.000
##      .Item9      0.396      0.032      12.467      0.000
##      .Item16     0.430      0.033      12.902      0.000
##      .Item23     0.144      0.013      10.831      0.000
##      .Item24     0.136      0.012      11.056      0.000
##      .Item26     0.167      0.014      11.911      0.000
##      .Item29     0.197      0.017      11.703      0.000
##      .Item19     0.204      0.017      11.963      0.000
##      .Item20     0.403      0.034      11.988      0.000
##      .Item22     0.326      0.026      12.388      0.000
##      .Item55     0.516      0.042      12.440      0.000
##      .Item3      0.487      0.042      11.737      0.000
##      .Item4      0.617      0.051      12.133      0.000
##      .Item6      0.279      0.026      10.923      0.000
##      .Item7      0.326      0.033      9.800      0.000
##      .Item8      0.601      0.048      12.482      0.000
##      .Item38     0.555      0.045      12.251      0.000
##      .Item27     0.322      0.047      6.899      0.000
##      .Item28     0.448      0.050      8.896      0.000
##      .Item36     0.342      0.029      11.732      0.000
##      Finance      1.000
##      Advice      1.000
##      F.Support    1.000
##      F.Involvement 1.000
##      Awareness    1.000
##      Consult      1.000
##      Symptom      1.000
##      Complementary 1.000

mi2 <- modindices(CFA352.fit, minimum.value = 3)
mi2[mi2$op == "~~",]

##      lhs op      rhs      mi      epc sepc.lv sepc.all sepc.nox
## 427 Item18 ~~ Item53 12.742 0.131 0.131 0.209 0.209
## 430 Item18 ~~ Item33 5.692 -0.049 -0.049 -0.142 -0.142
## 432 Item18 ~~ Item35 5.807 0.046 0.046 0.144 0.144
## 433 Item18 ~~ Item37 9.906 -0.087 -0.087 -0.178 -0.178
## 435 Item18 ~~ Item40 9.799 0.104 0.104 0.180 0.180
## 437 Item18 ~~ Item42 6.851 -0.066 -0.066 -0.155 -0.155
## 439 Item18 ~~ Item48 9.463 -0.088 -0.088 -0.179 -0.179
## 440 Item18 ~~ Item50 5.118 -0.062 -0.062 -0.130 -0.130
## 447 Item18 ~~ Item9 6.789 -0.068 -0.068 -0.149 -0.149
## 452 Item18 ~~ Item29 13.329 -0.069 -0.069 -0.214 -0.214
## 454 Item18 ~~ Item20 11.470 0.091 0.091 0.196 0.196
## 457 Item18 ~~ Item3 3.293 0.054 0.054 0.106 0.106
## 458 Item18 ~~ Item4 5.429 -0.077 -0.077 -0.134 -0.134
## 461 Item18 ~~ Item8 6.282 0.080 0.080 0.143 0.143
## 462 Item18 ~~ Item38 5.163 -0.071 -0.071 -0.130 -0.130
## 464 Item18 ~~ Item28 10.538 0.102 0.102 0.209 0.209
## 465 Item18 ~~ Item36 9.030 -0.075 -0.075 -0.176 -0.176

```

|        |        |    |        |        |        |        |        |        |
|--------|--------|----|--------|--------|--------|--------|--------|--------|
| ## 466 | Item25 | ~~ | Item51 | 10.039 | -0.096 | -0.096 | -0.193 | -0.193 |
| ## 467 | Item25 | ~~ | Item52 | 14.879 | -0.104 | -0.104 | -0.285 | -0.285 |
| ## 468 | Item25 | ~~ | Item53 | 7.350  | -0.087 | -0.087 | -0.168 | -0.168 |
| ## 469 | Item25 | ~~ | Item54 | 11.365 | -0.095 | -0.095 | -0.205 | -0.205 |
| ## 470 | Item25 | ~~ | Item31 | 3.360  | 0.031  | 0.031  | 0.113  | 0.113  |
| ## 475 | Item25 | ~~ | Item39 | 6.905  | 0.072  | 0.072  | 0.156  | 0.156  |
| ## 479 | Item25 | ~~ | Item46 | 8.124  | -0.081 | -0.081 | -0.171 | -0.171 |
| ## 491 | Item25 | ~~ | Item24 | 9.939  | 0.044  | 0.044  | 0.198  | 0.198  |
| ## 495 | Item25 | ~~ | Item20 | 10.067 | 0.073  | 0.073  | 0.193  | 0.193  |
| ## 499 | Item25 | ~~ | Item4  | 4.831  | -0.062 | -0.062 | -0.131 | -0.131 |
| ## 502 | Item25 | ~~ | Item8  | 4.893  | -0.061 | -0.061 | -0.131 | -0.131 |
| ## 503 | Item25 | ~~ | Item38 | 3.306  | 0.048  | 0.048  | 0.108  | 0.108  |
| ## 504 | Item25 | ~~ | Item27 | 5.413  | 0.059  | 0.059  | 0.174  | 0.174  |
| ## 507 | Item51 | ~~ | Item52 | 11.622 | 0.109  | 0.109  | 0.213  | 0.213  |
| ## 509 | Item51 | ~~ | Item54 | 6.265  | 0.091  | 0.091  | 0.140  | 0.140  |
| ## 513 | Item51 | ~~ | Item35 | 14.034 | -0.080 | -0.080 | -0.218 | -0.218 |
| ## 514 | Item51 | ~~ | Item37 | 8.404  | 0.090  | 0.090  | 0.161  | 0.161  |
| ## 521 | Item51 | ~~ | Item50 | 17.994 | 0.131  | 0.131  | 0.239  | 0.239  |
| ## 523 | Item51 | ~~ | Item12 | 6.697  | -0.062 | -0.062 | -0.161 | -0.161 |
| ## 527 | Item51 | ~~ | Item1  | 4.799  | -0.056 | -0.056 | -0.121 | -0.121 |
| ## 529 | Item51 | ~~ | Item16 | 3.117  | 0.053  | 0.053  | 0.097  | 0.097  |
| ## 532 | Item51 | ~~ | Item26 | 4.027  | -0.039 | -0.039 | -0.115 | -0.115 |
| ## 535 | Item51 | ~~ | Item20 | 7.814  | -0.084 | -0.084 | -0.158 | -0.158 |
| ## 536 | Item51 | ~~ | Item22 | 8.077  | 0.076  | 0.076  | 0.159  | 0.159  |
| ## 541 | Item51 | ~~ | Item7  | 4.188  | 0.060  | 0.060  | 0.125  | 0.125  |
| ## 543 | Item51 | ~~ | Item38 | 3.760  | 0.068  | 0.068  | 0.109  | 0.109  |
| ## 544 | Item51 | ~~ | Item27 | 24.440 | -0.163 | -0.163 | -0.345 | -0.345 |
| ## 546 | Item51 | ~~ | Item36 | 5.314  | 0.064  | 0.064  | 0.132  | 0.132  |
| ## 557 | Item52 | ~~ | Item42 | 4.723  | -0.050 | -0.050 | -0.137 | -0.137 |
| ## 560 | Item52 | ~~ | Item50 | 5.902  | 0.060  | 0.060  | 0.148  | 0.148  |
| ## 573 | Item52 | ~~ | Item19 | 4.538  | -0.037 | -0.037 | -0.133 | -0.133 |
| ## 576 | Item52 | ~~ | Item55 | 7.099  | 0.072  | 0.072  | 0.163  | 0.163  |
| ## 580 | Item52 | ~~ | Item7  | 3.017  | 0.041  | 0.041  | 0.116  | 0.116  |
| ## 581 | Item52 | ~~ | Item8  | 10.991 | 0.095  | 0.095  | 0.199  | 0.199  |
| ## 585 | Item52 | ~~ | Item36 | 6.557  | 0.057  | 0.057  | 0.158  | 0.158  |
| ## 586 | Item53 | ~~ | Item54 | 18.010 | 0.162  | 0.162  | 0.241  | 0.241  |
| ## 589 | Item53 | ~~ | Item34 | 4.569  | -0.051 | -0.051 | -0.129 | -0.129 |
| ## 590 | Item53 | ~~ | Item35 | 9.741  | 0.070  | 0.070  | 0.184  | 0.184  |
| ## 591 | Item53 | ~~ | Item37 | 13.120 | -0.118 | -0.118 | -0.202 | -0.202 |
| ## 593 | Item53 | ~~ | Item40 | 5.483  | 0.092  | 0.092  | 0.133  | 0.133  |
| ## 594 | Item53 | ~~ | Item41 | 9.245  | -0.088 | -0.088 | -0.181 | -0.181 |
| ## 595 | Item53 | ~~ | Item42 | 11.893 | -0.103 | -0.103 | -0.202 | -0.202 |
| ## 596 | Item53 | ~~ | Item46 | 28.136 | 0.207  | 0.207  | 0.302  | 0.302  |
| ## 597 | Item53 | ~~ | Item48 | 8.680  | 0.099  | 0.099  | 0.169  | 0.169  |
| ## 600 | Item53 | ~~ | Item12 | 10.035 | 0.079  | 0.079  | 0.198  | 0.198  |
| ## 613 | Item53 | ~~ | Item22 | 13.490 | -0.103 | -0.103 | -0.208 | -0.208 |
| ## 620 | Item53 | ~~ | Item38 | 3.851  | -0.072 | -0.072 | -0.111 | -0.111 |
| ## 623 | Item53 | ~~ | Item36 | 6.257  | -0.073 | -0.073 | -0.144 | -0.144 |
| ## 627 | Item54 | ~~ | Item35 | 3.103  | -0.035 | -0.035 | -0.103 | -0.103 |
| ## 628 | Item54 | ~~ | Item37 | 4.558  | 0.061  | 0.061  | 0.118  | 0.118  |
| ## 631 | Item54 | ~~ | Item41 | 13.071 | -0.092 | -0.092 | -0.213 | -0.213 |

|        |        |    |        |        |        |        |        |        |
|--------|--------|----|--------|--------|--------|--------|--------|--------|
| ## 632 | Item54 | ~~ | Item42 | 7.416  | -0.072 | -0.072 | -0.158 | -0.158 |
| ## 633 | Item54 | ~~ | Item46 | 28.849 | 0.186  | 0.186  | 0.303  | 0.303  |
| ## 634 | Item54 | ~~ | Item48 | 44.197 | 0.198  | 0.198  | 0.379  | 0.379  |
| ## 635 | Item54 | ~~ | Item50 | 13.991 | 0.107  | 0.107  | 0.211  | 0.211  |
| ## 637 | Item54 | ~~ | Item12 | 4.373  | -0.046 | -0.046 | -0.130 | -0.130 |
| ## 638 | Item54 | ~~ | Item13 | 5.659  | 0.059  | 0.059  | 0.145  | 0.145  |
| ## 640 | Item54 | ~~ | Item21 | 7.060  | 0.069  | 0.069  | 0.150  | 0.150  |
| ## 641 | Item54 | ~~ | Item1  | 7.373  | -0.065 | -0.065 | -0.150 | -0.150 |
| ## 649 | Item54 | ~~ | Item20 | 15.251 | -0.109 | -0.109 | -0.221 | -0.221 |
| ## 655 | Item54 | ~~ | Item7  | 4.282  | 0.056  | 0.056  | 0.127  | 0.127  |
| ## 656 | Item54 | ~~ | Item8  | 4.424  | -0.070 | -0.070 | -0.117 | -0.117 |
| ## 657 | Item54 | ~~ | Item38 | 4.403  | -0.068 | -0.068 | -0.118 | -0.118 |
| ## 658 | Item54 | ~~ | Item27 | 7.949  | -0.087 | -0.087 | -0.197 | -0.197 |
| ## 661 | Item31 | ~~ | Item33 | 6.040  | -0.035 | -0.035 | -0.161 | -0.161 |
| ## 666 | Item31 | ~~ | Item40 | 4.219  | -0.044 | -0.044 | -0.121 | -0.121 |
| ## 672 | Item31 | ~~ | Item11 | 3.164  | 0.030  | 0.030  | 0.109  | 0.109  |
| ## 675 | Item31 | ~~ | Item14 | 4.423  | -0.035 | -0.035 | -0.125 | -0.125 |
| ## 680 | Item31 | ~~ | Item23 | 5.052  | 0.025  | 0.025  | 0.141  | 0.141  |
| ## 683 | Item31 | ~~ | Item29 | 49.586 | 0.087  | 0.087  | 0.426  | 0.426  |
| ## 695 | Item31 | ~~ | Item28 | 3.605  | -0.039 | -0.039 | -0.126 | -0.126 |
| ## 697 | Item33 | ~~ | Item34 | 32.272 | 0.086  | 0.086  | 0.396  | 0.396  |
| ## 699 | Item33 | ~~ | Item37 | 4.608  | 0.041  | 0.041  | 0.128  | 0.128  |
| ## 703 | Item33 | ~~ | Item42 | 8.867  | 0.051  | 0.051  | 0.181  | 0.181  |
| ## 704 | Item33 | ~~ | Item46 | 3.697  | -0.043 | -0.043 | -0.114 | -0.114 |
| ## 708 | Item33 | ~~ | Item12 | 11.169 | -0.048 | -0.048 | -0.218 | -0.218 |
| ## 710 | Item33 | ~~ | Item14 | 5.637  | 0.041  | 0.041  | 0.142  | 0.142  |
| ## 718 | Item33 | ~~ | Item29 | 5.086  | -0.029 | -0.029 | -0.137 | -0.137 |
| ## 721 | Item33 | ~~ | Item22 | 6.949  | 0.042  | 0.042  | 0.155  | 0.155  |
| ## 728 | Item33 | ~~ | Item38 | 3.212  | 0.037  | 0.037  | 0.106  | 0.106  |
| ## 731 | Item33 | ~~ | Item36 | 6.451  | 0.042  | 0.042  | 0.153  | 0.153  |
| ## 733 | Item34 | ~~ | Item37 | 6.367  | 0.047  | 0.047  | 0.156  | 0.156  |
| ## 738 | Item34 | ~~ | Item46 | 9.171  | -0.066 | -0.066 | -0.184 | -0.184 |
| ## 742 | Item34 | ~~ | Item12 | 3.571  | -0.027 | -0.027 | -0.127 | -0.127 |
| ## 749 | Item34 | ~~ | Item23 | 10.903 | -0.037 | -0.037 | -0.214 | -0.214 |
| ## 752 | Item34 | ~~ | Item29 | 5.081  | 0.028  | 0.028  | 0.141  | 0.141  |
| ## 758 | Item34 | ~~ | Item4  | 5.681  | 0.052  | 0.052  | 0.145  | 0.145  |
| ## 762 | Item34 | ~~ | Item38 | 10.516 | 0.066  | 0.066  | 0.196  | 0.196  |
| ## 764 | Item34 | ~~ | Item28 | 10.424 | -0.067 | -0.067 | -0.220 | -0.220 |
| ## 765 | Item34 | ~~ | Item36 | 19.071 | 0.072  | 0.072  | 0.269  | 0.269  |
| ## 766 | Item35 | ~~ | Item37 | 5.749  | -0.042 | -0.042 | -0.143 | -0.143 |
| ## 771 | Item35 | ~~ | Item46 | 7.727  | 0.057  | 0.057  | 0.165  | 0.165  |
| ## 775 | Item35 | ~~ | Item12 | 18.294 | 0.057  | 0.057  | 0.280  | 0.280  |
| ## 780 | Item35 | ~~ | Item9  | 5.121  | -0.037 | -0.037 | -0.133 | -0.133 |
| ## 784 | Item35 | ~~ | Item26 | 4.021  | 0.022  | 0.022  | 0.121  | 0.121  |
| ## 785 | Item35 | ~~ | Item29 | 5.285  | -0.027 | -0.027 | -0.140 | -0.140 |
| ## 786 | Item35 | ~~ | Item19 | 4.434  | 0.025  | 0.025  | 0.126  | 0.126  |
| ## 788 | Item35 | ~~ | Item22 | 6.205  | -0.037 | -0.037 | -0.147 | -0.147 |
| ## 791 | Item35 | ~~ | Item4  | 21.485 | -0.095 | -0.095 | -0.275 | -0.275 |
| ## 794 | Item35 | ~~ | Item8  | 4.319  | 0.041  | 0.041  | 0.122  | 0.122  |
| ## 797 | Item35 | ~~ | Item28 | 9.051  | 0.059  | 0.059  | 0.200  | 0.200  |
| ## 798 | Item35 | ~~ | Item36 | 4.120  | 0.031  | 0.031  | 0.122  | 0.122  |

|         |        |    |        |         |        |        |        |        |
|---------|--------|----|--------|---------|--------|--------|--------|--------|
| ## 805  | Item37 | ~~ | Item50 | 15.092  | 0.096  | 0.096  | 0.218  | 0.218  |
| ## 820  | Item37 | ~~ | Item22 | 22.596  | 0.101  | 0.101  | 0.265  | 0.265  |
| ## 822  | Item37 | ~~ | Item3  | 3.151   | -0.047 | -0.047 | -0.101 | -0.101 |
| ## 825  | Item37 | ~~ | Item7  | 5.584   | 0.055  | 0.055  | 0.144  | 0.144  |
| ## 828  | Item37 | ~~ | Item27 | 18.850  | -0.115 | -0.115 | -0.302 | -0.302 |
| ## 829  | Item37 | ~~ | Item28 | 4.836   | -0.062 | -0.062 | -0.138 | -0.138 |
| ## 830  | Item37 | ~~ | Item36 | 18.566  | 0.096  | 0.096  | 0.246  | 0.246  |
| ## 831  | Item39 | ~~ | Item40 | 6.474   | 0.090  | 0.090  | 0.146  | 0.146  |
| ## 833  | Item39 | ~~ | Item42 | 6.353   | -0.069 | -0.069 | -0.151 | -0.151 |
| ## 834  | Item39 | ~~ | Item46 | 3.278   | 0.064  | 0.064  | 0.105  | 0.105  |
| ## 841  | Item39 | ~~ | Item21 | 4.808   | 0.057  | 0.057  | 0.124  | 0.124  |
| ## 844  | Item39 | ~~ | Item16 | 3.322   | -0.051 | -0.051 | -0.101 | -0.101 |
| ## 858  | Item39 | ~~ | Item38 | 18.510  | 0.140  | 0.140  | 0.243  | 0.243  |
| ## 863  | Item40 | ~~ | Item42 | 7.320   | -0.076 | -0.076 | -0.163 | -0.163 |
| ## 864  | Item40 | ~~ | Item46 | 5.997   | 0.090  | 0.090  | 0.142  | 0.142  |
| ## 865  | Item40 | ~~ | Item48 | 8.243   | -0.091 | -0.091 | -0.169 | -0.169 |
| ## 866  | Item40 | ~~ | Item50 | 5.247   | -0.069 | -0.069 | -0.133 | -0.133 |
| ## 875  | Item40 | ~~ | Item23 | 8.626   | -0.053 | -0.053 | -0.177 | -0.177 |
| ## 876  | Item40 | ~~ | Item24 | 3.112   | -0.031 | -0.031 | -0.105 | -0.105 |
| ## 877  | Item40 | ~~ | Item26 | 4.336   | 0.039  | 0.039  | 0.120  | 0.120  |
| ## 881  | Item40 | ~~ | Item22 | 3.156   | -0.046 | -0.046 | -0.100 | -0.100 |
| ## 882  | Item40 | ~~ | Item55 | 17.021  | 0.133  | 0.133  | 0.233  | 0.233  |
| ## 883  | Item40 | ~~ | Item3  | 6.064   | 0.079  | 0.079  | 0.142  | 0.142  |
| ## 886  | Item40 | ~~ | Item7  | 5.969   | -0.069 | -0.069 | -0.152 | -0.152 |
| ## 889  | Item40 | ~~ | Item27 | 4.813   | 0.070  | 0.070  | 0.155  | 0.155  |
| ## 892  | Item41 | ~~ | Item42 | 118.706 | 0.236  | 0.236  | 0.719  | 0.719  |
| ## 893  | Item41 | ~~ | Item46 | 21.803  | -0.129 | -0.129 | -0.292 | -0.292 |
| ## 894  | Item41 | ~~ | Item48 | 4.329   | -0.050 | -0.050 | -0.133 | -0.133 |
| ## 895  | Item41 | ~~ | Item50 | 5.745   | -0.055 | -0.055 | -0.149 | -0.149 |
| ## 899  | Item41 | ~~ | Item14 | 10.010  | 0.064  | 0.064  | 0.191  | 0.191  |
| ## 918  | Item41 | ~~ | Item27 | 3.882   | 0.046  | 0.046  | 0.147  | 0.147  |
| ## 921  | Item42 | ~~ | Item46 | 16.842  | -0.116 | -0.116 | -0.249 | -0.249 |
| ## 929  | Item42 | ~~ | Item1  | 3.004   | 0.033  | 0.033  | 0.099  | 0.099  |
| ## 933  | Item42 | ~~ | Item24 | 3.346   | -0.024 | -0.024 | -0.112 | -0.112 |
| ## 934  | Item42 | ~~ | Item26 | 5.383   | -0.033 | -0.033 | -0.138 | -0.138 |
| ## 949  | Item46 | ~~ | Item48 | 18.433  | 0.136  | 0.136  | 0.255  | 0.255  |
| ## 956  | Item46 | ~~ | Item1  | 7.256   | -0.067 | -0.067 | -0.151 | -0.151 |
| ## 964  | Item46 | ~~ | Item20 | 6.794   | -0.075 | -0.075 | -0.149 | -0.149 |
| ## 973  | Item46 | ~~ | Item27 | 5.754   | -0.076 | -0.076 | -0.170 | -0.170 |
| ## 974  | Item46 | ~~ | Item28 | 11.534  | 0.115  | 0.115  | 0.217  | 0.217  |
| ## 976  | Item48 | ~~ | Item50 | 26.960  | 0.136  | 0.136  | 0.307  | 0.307  |
| ## 977  | Item48 | ~~ | Item11 | 9.958   | -0.075 | -0.075 | -0.190 | -0.190 |
| ## 979  | Item48 | ~~ | Item13 | 3.599   | 0.042  | 0.042  | 0.119  | 0.119  |
| ## 993  | Item48 | ~~ | Item3  | 9.194   | -0.084 | -0.084 | -0.178 | -0.178 |
| ## 995  | Item48 | ~~ | Item6  | 5.973   | 0.053  | 0.053  | 0.148  | 0.148  |
| ## 1000 | Item48 | ~~ | Item28 | 3.692   | -0.056 | -0.056 | -0.124 | -0.124 |
| ## 1001 | Item48 | ~~ | Item36 | 4.157   | -0.047 | -0.047 | -0.120 | -0.120 |
| ## 1007 | Item50 | ~~ | Item1  | 3.301   | -0.037 | -0.037 | -0.101 | -0.101 |
| ## 1013 | Item50 | ~~ | Item29 | 7.398   | 0.046  | 0.046  | 0.159  | 0.159  |
| ## 1014 | Item50 | ~~ | Item19 | 3.938   | -0.034 | -0.034 | -0.114 | -0.114 |
| ## 1015 | Item50 | ~~ | Item20 | 6.816   | -0.062 | -0.062 | -0.149 | -0.149 |

|         |        |    |        |        |        |        |        |        |
|---------|--------|----|--------|--------|--------|--------|--------|--------|
| ## 1017 | Item50 | ~~ | Item55 | 4.492  | 0.057  | 0.057  | 0.120  | 0.120  |
| ## 1018 | Item50 | ~~ | Item3  | 3.594  | -0.050 | -0.050 | -0.110 | -0.110 |
| ## 1024 | Item50 | ~~ | Item27 | 11.516 | -0.089 | -0.089 | -0.240 | -0.240 |
| ## 1025 | Item50 | ~~ | Item28 | 4.012  | -0.056 | -0.056 | -0.128 | -0.128 |
| ## 1026 | Item50 | ~~ | Item36 | 5.588  | 0.053  | 0.053  | 0.137  | 0.137  |
| ## 1027 | Item11 | ~~ | Item12 | 4.673  | 0.045  | 0.045  | 0.168  | 0.168  |
| ## 1030 | Item11 | ~~ | Item21 | 9.502  | -0.067 | -0.067 | -0.192 | -0.192 |
| ## 1032 | Item11 | ~~ | Item9  | 3.016  | 0.038  | 0.038  | 0.103  | 0.103  |
| ## 1038 | Item11 | ~~ | Item19 | 5.957  | 0.039  | 0.039  | 0.146  | 0.146  |
| ## 1040 | Item11 | ~~ | Item22 | 5.555  | -0.047 | -0.047 | -0.140 | -0.140 |
| ## 1043 | Item11 | ~~ | Item4  | 3.441  | 0.051  | 0.051  | 0.111  | 0.111  |
| ## 1064 | Item12 | ~~ | Item55 | 4.140  | -0.042 | -0.042 | -0.128 | -0.128 |
| ## 1072 | Item12 | ~~ | Item28 | 7.557  | 0.060  | 0.060  | 0.195  | 0.195  |
| ## 1081 | Item13 | ~~ | Item26 | 5.102  | 0.030  | 0.030  | 0.142  | 0.142  |
| ## 1086 | Item13 | ~~ | Item55 | 3.050  | 0.041  | 0.041  | 0.108  | 0.108  |
| ## 1088 | Item13 | ~~ | Item4  | 3.740  | 0.049  | 0.049  | 0.120  | 0.120  |
| ## 1091 | Item13 | ~~ | Item8  | 3.916  | -0.049 | -0.049 | -0.121 | -0.121 |
| ## 1092 | Item13 | ~~ | Item38 | 4.440  | -0.051 | -0.051 | -0.130 | -0.130 |
| ## 1098 | Item14 | ~~ | Item9  | 5.429  | -0.051 | -0.051 | -0.133 | -0.133 |
| ## 1100 | Item14 | ~~ | Item23 | 3.255  | -0.025 | -0.025 | -0.110 | -0.110 |
| ## 1102 | Item14 | ~~ | Item26 | 6.011  | 0.035  | 0.035  | 0.143  | 0.143  |
| ## 1105 | Item14 | ~~ | Item20 | 4.701  | -0.048 | -0.048 | -0.125 | -0.125 |
| ## 1111 | Item14 | ~~ | Item7  | 3.414  | 0.040  | 0.040  | 0.116  | 0.116  |
| ## 1116 | Item14 | ~~ | Item36 | 6.129  | 0.051  | 0.051  | 0.145  | 0.145  |
| ## 1125 | Item21 | ~~ | Item20 | 7.665  | 0.060  | 0.060  | 0.158  | 0.158  |
| ## 1126 | Item21 | ~~ | Item22 | 16.627 | 0.079  | 0.079  | 0.231  | 0.231  |
| ## 1133 | Item21 | ~~ | Item38 | 4.595  | 0.054  | 0.054  | 0.122  | 0.122  |
| ## 1135 | Item21 | ~~ | Item28 | 3.864  | -0.050 | -0.050 | -0.126 | -0.126 |
| ## 1137 | Item1  | ~~ | Item9  | 13.462 | 0.072  | 0.072  | 0.205  | 0.205  |
| ## 1138 | Item1  | ~~ | Item16 | 4.675  | 0.044  | 0.044  | 0.119  | 0.119  |
| ## 1139 | Item1  | ~~ | Item23 | 8.838  | -0.038 | -0.038 | -0.179 | -0.179 |
| ## 1145 | Item1  | ~~ | Item22 | 11.351 | -0.060 | -0.060 | -0.187 | -0.187 |
| ## 1147 | Item1  | ~~ | Item3  | 3.124  | 0.039  | 0.039  | 0.100  | 0.100  |
| ## 1148 | Item1  | ~~ | Item4  | 3.994  | 0.049  | 0.049  | 0.112  | 0.112  |
| ## 1152 | Item1  | ~~ | Item38 | 5.057  | -0.052 | -0.052 | -0.125 | -0.125 |
| ## 1153 | Item1  | ~~ | Item27 | 8.883  | 0.065  | 0.065  | 0.206  | 0.206  |
| ## 1159 | Item9  | ~~ | Item26 | 12.555 | -0.054 | -0.054 | -0.208 | -0.208 |
| ## 1161 | Item9  | ~~ | Item19 | 3.060  | 0.028  | 0.028  | 0.100  | 0.100  |
| ## 1162 | Item9  | ~~ | Item20 | 3.335  | 0.042  | 0.042  | 0.104  | 0.104  |
| ## 1164 | Item9  | ~~ | Item55 | 3.650  | -0.049 | -0.049 | -0.108 | -0.108 |
| ## 1169 | Item9  | ~~ | Item8  | 3.383  | 0.050  | 0.050  | 0.103  | 0.103  |
| ## 1177 | Item16 | ~~ | Item29 | 11.719 | -0.058 | -0.058 | -0.198 | -0.198 |
| ## 1179 | Item16 | ~~ | Item20 | 4.807  | -0.051 | -0.051 | -0.123 | -0.123 |
| ## 1187 | Item16 | ~~ | Item38 | 5.017  | -0.061 | -0.061 | -0.125 | -0.125 |
| ## 1191 | Item23 | ~~ | Item24 | 28.498 | 0.052  | 0.052  | 0.375  | 0.375  |
| ## 1192 | Item23 | ~~ | Item26 | 6.847  | 0.026  | 0.026  | 0.170  | 0.170  |
| ## 1196 | Item23 | ~~ | Item22 | 5.472  | 0.031  | 0.031  | 0.142  | 0.142  |
| ## 1198 | Item23 | ~~ | Item3  | 7.643  | -0.045 | -0.045 | -0.170 | -0.170 |
| ## 1199 | Item23 | ~~ | Item4  | 3.030  | -0.031 | -0.031 | -0.105 | -0.105 |
| ## 1204 | Item23 | ~~ | Item27 | 4.903  | -0.036 | -0.036 | -0.168 | -0.168 |
| ## 1205 | Item23 | ~~ | Item28 | 3.101  | 0.031  | 0.031  | 0.120  | 0.120  |



|         |        |    |        |        |        |        |        |        |
|---------|--------|----|--------|--------|--------|--------|--------|--------|
| ## 1207 | Item24 | ~~ | Item26 | 3.456  | -0.018 | -0.018 | -0.119 | -0.119 |
| ## 1214 | Item24 | ~~ | Item4  | 11.344 | -0.058 | -0.058 | -0.202 | -0.202 |
| ## 1215 | Item24 | ~~ | Item6  | 5.337  | 0.028  | 0.028  | 0.145  | 0.145  |
| ## 1221 | Item24 | ~~ | Item36 | 4.187  | 0.027  | 0.027  | 0.125  | 0.125  |
| ## 1225 | Item26 | ~~ | Item22 | 10.214 | -0.043 | -0.043 | -0.185 | -0.185 |
| ## 1226 | Item26 | ~~ | Item55 | 7.683  | 0.047  | 0.047  | 0.160  | 0.160  |
| ## 1233 | Item26 | ~~ | Item27 | 17.481 | 0.070  | 0.070  | 0.302  | 0.302  |
| ## 1235 | Item26 | ~~ | Item36 | 8.258  | -0.041 | -0.041 | -0.169 | -0.169 |
| ## 1242 | Item29 | ~~ | Item6  | 5.297  | -0.033 | -0.033 | -0.140 | -0.140 |
| ## 1244 | Item29 | ~~ | Item8  | 8.885  | -0.059 | -0.059 | -0.172 | -0.172 |
| ## 1245 | Item29 | ~~ | Item38 | 3.792  | 0.038  | 0.038  | 0.113  | 0.113  |
| ## 1249 | Item19 | ~~ | Item20 | 6.971  | 0.048  | 0.048  | 0.168  | 0.168  |
| ## 1250 | Item19 | ~~ | Item22 | 3.865  | 0.031  | 0.031  | 0.120  | 0.120  |
| ## 1251 | Item19 | ~~ | Item55 | 10.123 | -0.063 | -0.063 | -0.193 | -0.193 |
| ## 1252 | Item19 | ~~ | Item3  | 5.792  | 0.044  | 0.044  | 0.140  | 0.140  |
| ## 1254 | Item19 | ~~ | Item6  | 6.553  | 0.037  | 0.037  | 0.154  | 0.154  |
| ## 1269 | Item20 | ~~ | Item27 | 15.132 | 0.102  | 0.102  | 0.282  | 0.282  |
| ## 1272 | Item22 | ~~ | Item55 | 5.549  | -0.057 | -0.057 | -0.138 | -0.138 |
| ## 1279 | Item22 | ~~ | Item27 | 18.294 | -0.099 | -0.099 | -0.305 | -0.305 |
| ## 1281 | Item22 | ~~ | Item36 | 5.751  | 0.046  | 0.046  | 0.138  | 0.138  |
| ## 1284 | Item55 | ~~ | Item6  | 6.250  | -0.056 | -0.056 | -0.149 | -0.149 |
| ## 1291 | Item3  | ~~ | Item4  | 12.064 | 0.115  | 0.115  | 0.210  | 0.210  |
| ## 1292 | Item3  | ~~ | Item6  | 6.067  | -0.060 | -0.060 | -0.161 | -0.161 |
| ## 1296 | Item3  | ~~ | Item27 | 15.359 | 0.112  | 0.112  | 0.282  | 0.282  |
| ## 1299 | Item4  | ~~ | Item6  | 3.090  | -0.046 | -0.046 | -0.112 | -0.112 |
| ## 1300 | Item4  | ~~ | Item7  | 18.182 | 0.131  | 0.131  | 0.292  | 0.292  |
| ## 1301 | Item4  | ~~ | Item8  | 7.758  | -0.098 | -0.098 | -0.162 | -0.162 |
| ## 1305 | Item4  | ~~ | Item36 | 3.557  | -0.050 | -0.050 | -0.110 | -0.110 |
| ## 1308 | Item6  | ~~ | Item38 | 5.121  | -0.056 | -0.056 | -0.142 | -0.142 |
| ## 1312 | Item7  | ~~ | Item8  | 4.604  | -0.063 | -0.063 | -0.142 | -0.142 |
| ## 1314 | Item7  | ~~ | Item27 | 7.048  | -0.067 | -0.067 | -0.207 | -0.207 |
| ## 1319 | Item8  | ~~ | Item28 | 3.175  | 0.059  | 0.059  | 0.113  | 0.113  |
| ## 1322 | Item38 | ~~ | Item28 | 3.917  | -0.063 | -0.063 | -0.126 | -0.126 |
| ## 1323 | Item38 | ~~ | Item36 | 12.736 | 0.090  | 0.090  | 0.207  | 0.207  |
| ## 1324 | Item27 | ~~ | Item28 | 19.847 | 0.303  | 0.303  | 0.798  | 0.798  |
| ## 1325 | Item27 | ~~ | Item36 | 4.555  | -0.070 | -0.070 | -0.210 | -0.210 |
| ## 1326 | Item28 | ~~ | Item36 | 3.436  | -0.059 | -0.059 | -0.150 | -0.150 |

## 2.2 Model modification

```

# fit a full CFA model 2

CFA352.8factor3 <- 'Finance =~ Item18 + Item25 + Item51 + Item52 + I
tem53 + Item54
Advice =~ Item31 + Item33 + Item34 + Item35 + Item37
F.Support =~ Item39 + Item40 + Item41 + Item42 + Item46 + Item48 + I
tem50
F.Involvement =~ Item11 + Item12 + Item13 + Item14 + Item21
Awareness =~ Item1 + Item9 + Item16 + Item23 + Item24 + Item26 + It
em29
Consult =~ Item19 + Item20 + Item22 + Item55
Symptom =~ Item3 + Item4 + Item6 + Item7 + Item8 + Item38
Complementary =~ Item27 + Item28 + Item36
Item18 ~~ Item53
Item18 ~~ Item33
Item18 ~~ Item35
Item18 ~~ Item37
Item18 ~~ Item40
Item18 ~~ Item42
Item18 ~~ Item48
Item18 ~~ Item50
Item18 ~~ Item9
Item18 ~~ Item29
Item18 ~~ Item20
Item18 ~~ Item3
Item18 ~~ Item4
Item18 ~~ Item8
Item18 ~~ Item38
Item18 ~~ Item28
Item18 ~~ Item36
Item25 ~~ Item51
Item25 ~~ Item52
Item25 ~~ Item53
Item25 ~~ Item54
Item25 ~~ Item31
Item25 ~~ Item39
Item25 ~~ Item46
Item25 ~~ Item24
Item25 ~~ Item20
Item25 ~~ Item4
Item25 ~~ Item8
Item25 ~~ Item38
Item25 ~~ Item27
Item51 ~~ Item52
Item51 ~~ Item54
Item51 ~~ Item35
Item51 ~~ Item37
Item51 ~~ Item50
Item51 ~~ Item12

```

Item51 ~~ Item1  
Item51 ~~ Item16  
Item51 ~~ Item26  
Item51 ~~ Item20  
Item51 ~~ Item22  
Item51 ~~ Item7  
Item51 ~~ Item38  
Item51 ~~ Item27  
Item51 ~~ Item36  
Item52 ~~ Item42  
Item52 ~~ Item50  
Item52 ~~ Item19  
Item52 ~~ Item55  
Item52 ~~ Item7  
Item52 ~~ Item8  
Item52 ~~ Item36  
Item53 ~~ Item54  
Item53 ~~ Item34  
Item53 ~~ Item35  
Item53 ~~ Item37  
Item53 ~~ Item40  
Item53 ~~ Item41  
Item53 ~~ Item42  
Item53 ~~ Item46  
Item53 ~~ Item48  
Item53 ~~ Item12  
Item53 ~~ Item22  
Item53 ~~ Item38  
Item53 ~~ Item36  
Item54 ~~ Item35  
Item54 ~~ Item37  
Item54 ~~ Item41  
Item54 ~~ Item42  
Item54 ~~ Item46  
Item54 ~~ Item48  
Item54 ~~ Item50  
Item54 ~~ Item12  
Item54 ~~ Item13  
Item54 ~~ Item21  
Item54 ~~ Item1  
Item54 ~~ Item20  
Item54 ~~ Item7  
Item54 ~~ Item8  
Item54 ~~ Item38  
Item54 ~~ Item27  
Item31 ~~ Item33  
Item31 ~~ Item40  
Item31 ~~ Item11  
Item31 ~~ Item14  
Item31 ~~ Item23  
Item31 ~~ Item29

Item31 ~~ Item28  
Item33 ~~ Item34  
Item33 ~~ Item37  
Item33 ~~ Item42  
Item33 ~~ Item46  
Item33 ~~ Item12  
Item33 ~~ Item14  
Item33 ~~ Item29  
Item33 ~~ Item22  
Item33 ~~ Item38  
Item33 ~~ Item36  
Item34 ~~ Item37  
Item34 ~~ Item46  
Item34 ~~ Item12  
Item34 ~~ Item23  
Item34 ~~ Item29  
Item34 ~~ Item4  
Item34 ~~ Item38  
Item34 ~~ Item28  
Item34 ~~ Item36  
Item35 ~~ Item37  
Item35 ~~ Item46  
Item35 ~~ Item12  
Item35 ~~ Item9  
Item35 ~~ Item26  
Item35 ~~ Item29  
Item35 ~~ Item19  
Item35 ~~ Item22  
Item35 ~~ Item4  
Item35 ~~ Item8  
Item35 ~~ Item28  
Item35 ~~ Item36  
Item37 ~~ Item50  
Item37 ~~ Item22  
Item37 ~~ Item3  
Item37 ~~ Item7  
Item37 ~~ Item27  
Item37 ~~ Item28  
Item37 ~~ Item36  
Item39 ~~ Item40  
Item39 ~~ Item42  
Item39 ~~ Item46  
Item39 ~~ Item21  
Item39 ~~ Item16  
Item39 ~~ Item38  
Item40 ~~ Item42  
Item40 ~~ Item46  
Item40 ~~ Item48  
Item40 ~~ Item50  
Item40 ~~ Item23  
Item40 ~~ Item24

Item40 ~~ Item26  
Item40 ~~ Item22  
Item40 ~~ Item55  
Item40 ~~ Item3  
Item40 ~~ Item7  
Item40 ~~ Item27  
Item41 ~~ Item42  
Item41 ~~ Item46  
Item41 ~~ Item48  
Item41 ~~ Item50  
Item41 ~~ Item14  
Item41 ~~ Item27  
Item42 ~~ Item46  
Item42 ~~ Item1  
Item42 ~~ Item24  
Item42 ~~ Item26  
Item46 ~~ Item48  
Item46 ~~ Item1  
Item46 ~~ Item20  
Item46 ~~ Item27  
Item46 ~~ Item28  
Item48 ~~ Item50  
Item48 ~~ Item11  
Item48 ~~ Item13  
Item48 ~~ Item3  
Item48 ~~ Item6  
Item48 ~~ Item28  
Item48 ~~ Item36  
Item50 ~~ Item1  
Item50 ~~ Item29  
Item50 ~~ Item19  
Item50 ~~ Item20  
Item50 ~~ Item55  
Item50 ~~ Item3  
Item50 ~~ Item27  
Item50 ~~ Item28  
Item50 ~~ Item36  
Item11 ~~ Item12  
Item11 ~~ Item21  
Item11 ~~ Item9  
Item11 ~~ Item19  
Item11 ~~ Item22  
Item11 ~~ Item4  
Item12 ~~ Item55  
Item12 ~~ Item28  
Item13 ~~ Item26  
Item13 ~~ Item55  
Item13 ~~ Item4  
Item13 ~~ Item8  
Item13 ~~ Item38  
Item14 ~~ Item9

Item14 ~~ Item23  
Item14 ~~ Item26  
Item14 ~~ Item20  
Item14 ~~ Item7  
Item14 ~~ Item36  
Item21 ~~ Item20  
Item21 ~~ Item22  
Item21 ~~ Item38  
Item21 ~~ Item28  
Item1 ~~ Item9  
Item1 ~~ Item16  
Item1 ~~ Item23  
Item1 ~~ Item22  
Item1 ~~ Item3  
Item1 ~~ Item4  
Item1 ~~ Item38  
Item1 ~~ Item27  
Item9 ~~ Item26  
Item9 ~~ Item19  
Item9 ~~ Item20  
Item9 ~~ Item55  
Item9 ~~ Item8  
Item16 ~~ Item29  
Item16 ~~ Item20  
Item16 ~~ Item38  
Item23 ~~ Item24  
Item23 ~~ Item26  
Item23 ~~ Item22  
Item23 ~~ Item3  
Item23 ~~ Item4  
Item23 ~~ Item27  
Item23 ~~ Item28  
Item24 ~~ Item26  
Item24 ~~ Item4  
Item24 ~~ Item6  
Item24 ~~ Item36  
Item26 ~~ Item22  
Item26 ~~ Item55  
Item26 ~~ Item27  
Item26 ~~ Item36  
Item29 ~~ Item6  
Item29 ~~ Item8  
Item29 ~~ Item38  
Item19 ~~ Item20  
Item19 ~~ Item22  
Item19 ~~ Item55  
Item19 ~~ Item3  
Item19 ~~ Item6  
Item20 ~~ Item27  
Item22 ~~ Item55  
Item22 ~~ Item27

```

Item22 ~~ Item36

# fit a full CFA model
CFA352.fit3 <- cfa(CFA352.8factor3, data = data, std.lv = TRUE)

## Warning in lav_object_post_check(object): lavaan WARNING: the cov
arance matrix of the residuals of the observed
##           variables (theta) is not positive definite;
##           use lavInspect(fit, "theta") to investigate.

fitMeasures(CFA352.fit3)

##           npar           fmin           chisq
##           355.000         1.225         862.739
##           df           pvalue         baseline.chisq
##           591.000           0.000         7983.097
##           baseline.df         baseline.pvalue           cfi
##           903.000           0.000           0.962
##           tli           nnfi           rfi
##           0.941           0.941           0.835
##           nfi           pnfi           ifi
##           0.892           0.584           0.963
##           rni           logl         unrestricted.logl
##           0.962         -14419.327         -13987.957
##           aic           bic           ntotal
##           29548.654         30920.243         352.000
##           bic2           rmsea         rmsea.ci.lower
##           29794.045           0.036           0.031
##           rmsea.ci.upper         rmsea.pvalue           rmr
##           0.041           1.000           0.042
##           rmr_nomean           srmr           srmr_bentler
##           0.042           0.060           0.060
##           srmr_bentler_nomean           crmr           crmr_nomean
##           0.060           0.060           0.060
##           srmr_mplus         srmr_mplus_nomean           cn_05
##           0.059           0.059           265.657
##           cn_01           gfi           agfi
##           275.957           0.902           0.843
##           pgfi           mfi           ecvi
##           0.563           0.680           4.468

summary(CFA352.fit3, fit.measures = TRUE)

## lavaan 0.6-3 ended normally after 120 iterations
##
## Optimization method           NLMINB
## Number of free parameters           355
##
## Number of observations           352
##
## Estimator           ML
## Model Fit Test Statistic           862.739

```

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## Degrees of freedom 591
## P-value (Chi-square) 0.000
##
## Model test baseline model:
##
## Minimum Function Test Statistic 7983.097
## Degrees of freedom 903
## P-value 0.000
##
## User model versus baseline model:
##
## Comparative Fit Index (CFI) 0.962
## Tucker-Lewis Index (TLI) 0.941
##
## Loglikelihood and Information Criteria:
##
## Loglikelihood user model (H0) -14419.327
## Loglikelihood unrestricted model (H1) -13987.957
##
## Number of free parameters 355
## Akaike (AIC) 29548.654
## Bayesian (BIC) 30920.243
## Sample-size adjusted Bayesian (BIC) 29794.045
##
## Root Mean Square Error of Approximation:
##
## RMSEA 0.036
## 90 Percent Confidence Interval 0.031 0.041
## P-value RMSEA <= 0.05 1.000
##
## Standardized Root Mean Square Residual:
##
## SRMR 0.060
##
## Parameter Estimates:
##
## Information Expected
## Information saturated (h1) model Structured
## Standard Errors Standard
##
## Latent Variables:
## Estimate Std.Err z-value P(>|z|)
## Finance =~
## Item18 0.487 0.045 10.909 0.000
## Item25 0.717 0.044 16.306 0.000
## Item51 0.418 0.054 7.674 0.000
## Item52 0.702 0.046 15.339 0.000
## Item53 0.535 0.056 9.506 0.000
## Item54 0.418 0.047 8.883 0.000
## Advice =~
## Item31 0.423 0.032 13.363 0.000

```



|    |                  |          |         |         |         |
|----|------------------|----------|---------|---------|---------|
| ## | Item33           | 0.388    | 0.034   | 11.565  | 0.000   |
| ## | Item34           | 0.442    | 0.033   | 13.261  | 0.000   |
| ## | Item35           | 0.427    | 0.029   | 14.793  | 0.000   |
| ## | Item37           | 0.290    | 0.041   | 7.106   | 0.000   |
| ## | F.Support =~     |          |         |         |         |
| ## | Item39           | 0.433    | 0.049   | 8.752   | 0.000   |
| ## | Item40           | 0.534    | 0.051   | 10.381  | 0.000   |
| ## | Item41           | 0.545    | 0.041   | 13.205  | 0.000   |
| ## | Item42           | 0.490    | 0.042   | 11.751  | 0.000   |
| ## | Item46           | 0.573    | 0.054   | 10.672  | 0.000   |
| ## | Item48           | 0.480    | 0.046   | 10.526  | 0.000   |
| ## | Item50           | 0.383    | 0.041   | 9.341   | 0.000   |
| ## | F.Involvement =~ |          |         |         |         |
| ## | Item11           | 0.594    | 0.042   | 14.011  | 0.000   |
| ## | Item12           | 0.594    | 0.036   | 16.644  | 0.000   |
| ## | Item13           | 0.651    | 0.039   | 16.495  | 0.000   |
| ## | Item14           | 0.470    | 0.039   | 12.215  | 0.000   |
| ## | Item21           | 0.421    | 0.037   | 11.315  | 0.000   |
| ## | Awareness =~     |          |         |         |         |
| ## | Item1            | 0.278    | 0.033   | 8.399   | 0.000   |
| ## | Item9            | 0.477    | 0.039   | 12.089  | 0.000   |
| ## | Item16           | 0.378    | 0.039   | 9.790   | 0.000   |
| ## | Item23           | 0.433    | 0.029   | 14.799  | 0.000   |
| ## | Item24           | 0.388    | 0.028   | 14.080  | 0.000   |
| ## | Item26           | 0.399    | 0.028   | 14.026  | 0.000   |
| ## | Item29           | 0.476    | 0.031   | 15.595  | 0.000   |
| ## | Consult =~       |          |         |         |         |
| ## | Item19           | 0.392    | 0.031   | 12.461  | 0.000   |
| ## | Item20           | 0.531    | 0.042   | 12.758  | 0.000   |
| ## | Item22           | 0.410    | 0.036   | 11.315  | 0.000   |
| ## | Item55           | 0.570    | 0.047   | 12.205  | 0.000   |
| ## | Symptom =~       |          |         |         |         |
| ## | Item3            | 0.491    | 0.045   | 10.845  | 0.000   |
| ## | Item4            | 0.450    | 0.048   | 9.297   | 0.000   |
| ## | Item6            | 0.459    | 0.036   | 12.711  | 0.000   |
| ## | Item7            | 0.582    | 0.042   | 13.958  | 0.000   |
| ## | Item8            | 0.390    | 0.047   | 8.326   | 0.000   |
| ## | Item38           | 0.438    | 0.046   | 9.592   | 0.000   |
| ## | Complementary =~ |          |         |         |         |
| ## | Item27           | 0.946    | 0.051   | 18.658  | 0.000   |
| ## | Item28           | 0.935    | 0.054   | 17.402  | 0.000   |
| ## | Item36           | 0.504    | 0.038   | 13.275  | 0.000   |
| ## |                  |          |         |         |         |
| ## | Covariances:     |          |         |         |         |
| ## |                  | Estimate | Std.Err | z-value | P(> z ) |
| ## | .Item18 ~~       |          |         |         |         |
| ## | .Item53          | 0.098    | 0.034   | 2.901   | 0.004   |
| ## | .Item33          | -0.024   | 0.018   | -1.352  | 0.176   |
| ## | .Item35          | 0.020    | 0.017   | 1.186   | 0.236   |
| ## | .Item37          | -0.051   | 0.024   | -2.079  | 0.038   |
| ## | .Item40          | 0.080    | 0.028   | 2.831   | 0.005   |

|    |            |        |       |        |       |
|----|------------|--------|-------|--------|-------|
| ## | .Item42    | -0.022 | 0.020 | -1.075 | 0.282 |
| ## | .Item48    | -0.044 | 0.025 | -1.750 | 0.080 |
| ## | .Item50    | -0.033 | 0.025 | -1.314 | 0.189 |
| ## | .Item9     | -0.047 | 0.023 | -2.072 | 0.038 |
| ## | .Item29    | -0.051 | 0.016 | -3.257 | 0.001 |
| ## | .Item20    | 0.102  | 0.024 | 4.225  | 0.000 |
| ## | .Item3     | 0.051  | 0.027 | 1.924  | 0.054 |
| ## | .Item4     | -0.083 | 0.030 | -2.791 | 0.005 |
| ## | .Item8     | 0.061  | 0.029 | 2.058  | 0.040 |
| ## | .Item38    | -0.036 | 0.028 | -1.322 | 0.186 |
| ## | .Item28    | 0.069  | 0.029 | 2.327  | 0.020 |
| ## | .Item36    | -0.035 | 0.022 | -1.585 | 0.113 |
| ## | .Item25 ~~ |        |       |        |       |
| ## | .Item51    | -0.103 | 0.031 | -3.384 | 0.001 |
| ## | .Item52    | -0.174 | 0.031 | -5.663 | 0.000 |
| ## | .Item53    | -0.114 | 0.033 | -3.496 | 0.000 |
| ## | .Item54    | -0.093 | 0.027 | -3.378 | 0.001 |
| ## | .Item31    | -0.004 | 0.014 | -0.300 | 0.764 |
| ## | .Item39    | 0.044  | 0.025 | 1.791  | 0.073 |
| ## | .Item46    | -0.091 | 0.026 | -3.582 | 0.000 |
| ## | .Item24    | 0.049  | 0.012 | 3.934  | 0.000 |
| ## | .Item20    | 0.060  | 0.021 | 2.859  | 0.004 |
| ## | .Item4     | -0.081 | 0.025 | -3.189 | 0.001 |
| ## | .Item8     | -0.057 | 0.024 | -2.366 | 0.018 |
| ## | .Item38    | 0.026  | 0.023 | 1.103  | 0.270 |
| ## | .Item27    | 0.038  | 0.023 | 1.636  | 0.102 |
| ## | .Item51 ~~ |        |       |        |       |
| ## | .Item52    | 0.049  | 0.033 | 1.499  | 0.134 |
| ## | .Item54    | 0.061  | 0.031 | 1.961  | 0.050 |
| ## | .Item35    | -0.058 | 0.019 | -3.080 | 0.002 |
| ## | .Item37    | 0.032  | 0.028 | 1.122  | 0.262 |
| ## | .Item50    | 0.106  | 0.029 | 3.623  | 0.000 |
| ## | .Item12    | -0.052 | 0.021 | -2.426 | 0.015 |
| ## | .Item1     | -0.076 | 0.024 | -3.198 | 0.001 |
| ## | .Item16    | 0.032  | 0.027 | 1.213  | 0.225 |
| ## | .Item26    | -0.047 | 0.017 | -2.705 | 0.007 |
| ## | .Item20    | -0.053 | 0.026 | -2.023 | 0.043 |
| ## | .Item22    | 0.064  | 0.024 | 2.672  | 0.008 |
| ## | .Item7     | 0.061  | 0.027 | 2.242  | 0.025 |
| ## | .Item38    | 0.074  | 0.031 | 2.392  | 0.017 |
| ## | .Item27    | -0.133 | 0.032 | -4.103 | 0.000 |
| ## | .Item36    | 0.028  | 0.026 | 1.068  | 0.285 |
| ## | .Item52 ~~ |        |       |        |       |
| ## | .Item42    | -0.037 | 0.019 | -1.983 | 0.047 |
| ## | .Item50    | 0.073  | 0.024 | 3.035  | 0.002 |
| ## | .Item19    | -0.030 | 0.015 | -1.962 | 0.050 |
| ## | .Item55    | 0.073  | 0.025 | 2.890  | 0.004 |
| ## | .Item7     | 0.069  | 0.022 | 3.100  | 0.002 |
| ## | .Item8     | 0.090  | 0.026 | 3.419  | 0.001 |
| ## | .Item36    | 0.064  | 0.020 | 3.172  | 0.002 |
| ## | .Item53 ~~ |        |       |        |       |

|    |            |        |       |        |       |
|----|------------|--------|-------|--------|-------|
| ## | .Item54    | 0.129  | 0.036 | 3.617  | 0.000 |
| ## | .Item34    | -0.041 | 0.021 | -1.898 | 0.058 |
| ## | .Item35    | 0.035  | 0.020 | 1.709  | 0.087 |
| ## | .Item37    | -0.095 | 0.029 | -3.248 | 0.001 |
| ## | .Item40    | 0.097  | 0.035 | 2.777  | 0.005 |
| ## | .Item41    | -0.029 | 0.029 | -1.013 | 0.311 |
| ## | .Item42    | -0.060 | 0.031 | -1.974 | 0.048 |
| ## | .Item46    | 0.193  | 0.039 | 4.976  | 0.000 |
| ## | .Item48    | 0.106  | 0.033 | 3.212  | 0.001 |
| ## | .Item12    | 0.060  | 0.023 | 2.666  | 0.008 |
| ## | .Item22    | -0.067 | 0.024 | -2.838 | 0.005 |
| ## | .Item38    | -0.028 | 0.032 | -0.872 | 0.383 |
| ## | .Item36    | -0.043 | 0.026 | -1.651 | 0.099 |
| ## | .Item54 ~~ |        |       |        |       |
| ## | .Item35    | -0.019 | 0.016 | -1.185 | 0.236 |
| ## | .Item37    | 0.029  | 0.023 | 1.272  | 0.203 |
| ## | .Item41    | -0.033 | 0.024 | -1.362 | 0.173 |
| ## | .Item42    | -0.026 | 0.025 | -1.033 | 0.302 |
| ## | .Item46    | 0.206  | 0.033 | 6.189  | 0.000 |
| ## | .Item48    | 0.181  | 0.030 | 5.949  | 0.000 |
| ## | .Item50    | 0.118  | 0.026 | 4.592  | 0.000 |
| ## | .Item12    | -0.017 | 0.020 | -0.888 | 0.375 |
| ## | .Item13    | 0.060  | 0.022 | 2.668  | 0.008 |
| ## | .Item21    | 0.069  | 0.022 | 3.131  | 0.002 |
| ## | .Item1     | -0.081 | 0.020 | -4.031 | 0.000 |
| ## | .Item20    | -0.081 | 0.024 | -3.424 | 0.001 |
| ## | .Item7     | 0.050  | 0.023 | 2.176  | 0.030 |
| ## | .Item8     | -0.063 | 0.028 | -2.293 | 0.022 |
| ## | .Item38    | -0.045 | 0.027 | -1.667 | 0.096 |
| ## | .Item27    | -0.064 | 0.027 | -2.392 | 0.017 |
| ## | .Item31 ~~ |        |       |        |       |
| ## | .Item33    | -0.005 | 0.013 | -0.409 | 0.683 |
| ## | .Item40    | -0.016 | 0.018 | -0.871 | 0.384 |
| ## | .Item11    | 0.018  | 0.014 | 1.243  | 0.214 |
| ## | .Item14    | -0.021 | 0.015 | -1.458 | 0.145 |
| ## | .Item23    | 0.026  | 0.009 | 2.698  | 0.007 |
| ## | .Item29    | 0.083  | 0.014 | 5.978  | 0.000 |
| ## | .Item28    | -0.056 | 0.019 | -3.020 | 0.003 |
| ## | .Item33 ~~ |        |       |        |       |
| ## | .Item34    | 0.094  | 0.017 | 5.614  | 0.000 |
| ## | .Item37    | 0.051  | 0.019 | 2.624  | 0.009 |
| ## | .Item42    | 0.043  | 0.014 | 3.140  | 0.002 |
| ## | .Item46    | -0.033 | 0.020 | -1.688 | 0.091 |
| ## | .Item12    | -0.048 | 0.014 | -3.380 | 0.001 |
| ## | .Item14    | 0.016  | 0.015 | 1.068  | 0.285 |
| ## | .Item29    | -0.020 | 0.013 | -1.612 | 0.107 |
| ## | .Item22    | 0.027  | 0.014 | 1.911  | 0.056 |
| ## | .Item38    | 0.037  | 0.019 | 1.903  | 0.057 |
| ## | .Item36    | 0.072  | 0.017 | 4.304  | 0.000 |
| ## | .Item34 ~~ |        |       |        |       |
| ## | .Item37    | 0.045  | 0.019 | 2.391  | 0.017 |

|    |            |        |       |        |       |
|----|------------|--------|-------|--------|-------|
| ## | .Item46    | -0.063 | 0.020 | -3.155 | 0.002 |
| ## | .Item12    | -0.031 | 0.014 | -2.275 | 0.023 |
| ## | .Item23    | -0.021 | 0.009 | -2.186 | 0.029 |
| ## | .Item29    | 0.013  | 0.012 | 1.086  | 0.278 |
| ## | .Item4     | 0.044  | 0.020 | 2.270  | 0.023 |
| ## | .Item38    | 0.064  | 0.019 | 3.260  | 0.001 |
| ## | .Item28    | -0.055 | 0.020 | -2.831 | 0.005 |
| ## | .Item36    | 0.078  | 0.017 | 4.608  | 0.000 |
| ## | .Item35 ~~ |        |       |        |       |
| ## | .Item37    | -0.007 | 0.015 | -0.436 | 0.663 |
| ## | .Item46    | 0.034  | 0.017 | 1.967  | 0.049 |
| ## | .Item12    | 0.035  | 0.012 | 2.949  | 0.003 |
| ## | .Item9     | -0.035 | 0.014 | -2.456 | 0.014 |
| ## | .Item26    | 0.009  | 0.009 | 1.015  | 0.310 |
| ## | .Item29    | -0.008 | 0.011 | -0.733 | 0.464 |
| ## | .Item19    | 0.024  | 0.011 | 2.286  | 0.022 |
| ## | .Item22    | -0.025 | 0.013 | -1.877 | 0.060 |
| ## | .Item4     | -0.068 | 0.018 | -3.786 | 0.000 |
| ## | .Item8     | 0.018  | 0.017 | 1.065  | 0.287 |
| ## | .Item28    | 0.011  | 0.019 | 0.609  | 0.542 |
| ## | .Item36    | 0.054  | 0.014 | 3.899  | 0.000 |
| ## | .Item37 ~~ |        |       |        |       |
| ## | .Item50    | 0.098  | 0.022 | 4.467  | 0.000 |
| ## | .Item22    | 0.076  | 0.019 | 3.960  | 0.000 |
| ## | .Item3     | -0.017 | 0.024 | -0.718 | 0.473 |
| ## | .Item7     | 0.064  | 0.021 | 3.005  | 0.003 |
| ## | .Item27    | -0.106 | 0.029 | -3.623 | 0.000 |
| ## | .Item28    | -0.104 | 0.032 | -3.229 | 0.001 |
| ## | .Item36    | 0.077  | 0.024 | 3.174  | 0.002 |
| ## | .Item39 ~~ |        |       |        |       |
| ## | .Item40    | 0.089  | 0.034 | 2.632  | 0.008 |
| ## | .Item42    | -0.025 | 0.022 | -1.148 | 0.251 |
| ## | .Item46    | 0.056  | 0.033 | 1.687  | 0.092 |
| ## | .Item21    | 0.057  | 0.024 | 2.376  | 0.018 |
| ## | .Item16    | -0.043 | 0.026 | -1.657 | 0.098 |
| ## | .Item38    | 0.146  | 0.032 | 4.590  | 0.000 |
| ## | .Item40 ~~ |        |       |        |       |
| ## | .Item42    | -0.045 | 0.023 | -1.928 | 0.054 |
| ## | .Item46    | 0.063  | 0.037 | 1.685  | 0.092 |
| ## | .Item48    | -0.085 | 0.029 | -2.900 | 0.004 |
| ## | .Item50    | -0.070 | 0.027 | -2.595 | 0.009 |
| ## | .Item23    | -0.063 | 0.018 | -3.456 | 0.001 |
| ## | .Item24    | -0.038 | 0.017 | -2.239 | 0.025 |
| ## | .Item26    | 0.017  | 0.018 | 0.996  | 0.319 |
| ## | .Item22    | -0.035 | 0.022 | -1.627 | 0.104 |
| ## | .Item55    | 0.111  | 0.029 | 3.820  | 0.000 |
| ## | .Item3     | 0.044  | 0.030 | 1.485  | 0.138 |
| ## | .Item7     | -0.091 | 0.026 | -3.534 | 0.000 |
| ## | .Item27    | 0.019  | 0.029 | 0.648  | 0.517 |
| ## | .Item41 ~~ |        |       |        |       |
| ## | .Item42    | 0.171  | 0.027 | 6.361  | 0.000 |

|    |            |        |       |        |       |
|----|------------|--------|-------|--------|-------|
| ## | .Item46    | -0.082 | 0.029 | -2.879 | 0.004 |
| ## | .Item48    | -0.000 | 0.021 | -0.018 | 0.986 |
| ## | .Item50    | -0.018 | 0.019 | -0.957 | 0.339 |
| ## | .Item14    | 0.058  | 0.017 | 3.420  | 0.001 |
| ## | .Item27    | 0.022  | 0.018 | 1.199  | 0.231 |
| ## | .Item42 ~~ |        |       |        |       |
| ## | .Item46    | -0.085 | 0.029 | -2.944 | 0.003 |
| ## | .Item1     | 0.022  | 0.015 | 1.447  | 0.148 |
| ## | .Item24    | -0.009 | 0.011 | -0.809 | 0.419 |
| ## | .Item26    | -0.035 | 0.011 | -3.112 | 0.002 |
| ## | .Item46 ~~ |        |       |        |       |
| ## | .Item48    | 0.097  | 0.033 | 2.935  | 0.003 |
| ## | .Item1     | -0.061 | 0.021 | -2.949 | 0.003 |
| ## | .Item20    | -0.083 | 0.025 | -3.375 | 0.001 |
| ## | .Item27    | -0.066 | 0.032 | -2.032 | 0.042 |
| ## | .Item28    | 0.051  | 0.034 | 1.476  | 0.140 |
| ## | .Item48 ~~ |        |       |        |       |
| ## | .Item50    | 0.101  | 0.025 | 4.127  | 0.000 |
| ## | .Item11    | -0.073 | 0.021 | -3.437 | 0.001 |
| ## | .Item13    | 0.018  | 0.020 | 0.919  | 0.358 |
| ## | .Item3     | -0.068 | 0.025 | -2.701 | 0.007 |
| ## | .Item6     | 0.049  | 0.019 | 2.530  | 0.011 |
| ## | .Item28    | -0.057 | 0.028 | -2.042 | 0.041 |
| ## | .Item36    | -0.049 | 0.019 | -2.531 | 0.011 |
| ## | .Item50 ~~ |        |       |        |       |
| ## | .Item1     | -0.022 | 0.017 | -1.277 | 0.202 |
| ## | .Item29    | 0.032  | 0.014 | 2.384  | 0.017 |
| ## | .Item19    | -0.029 | 0.015 | -1.895 | 0.058 |
| ## | .Item20    | -0.053 | 0.021 | -2.498 | 0.012 |
| ## | .Item55    | 0.046  | 0.024 | 1.921  | 0.055 |
| ## | .Item3     | -0.042 | 0.025 | -1.720 | 0.085 |
| ## | .Item27    | -0.083 | 0.030 | -2.812 | 0.005 |
| ## | .Item28    | -0.070 | 0.033 | -2.156 | 0.031 |
| ## | .Item36    | 0.026  | 0.022 | 1.178  | 0.239 |
| ## | .Item11 ~~ |        |       |        |       |
| ## | .Item12    | 0.012  | 0.020 | 0.578  | 0.563 |
| ## | .Item21    | -0.054 | 0.020 | -2.697 | 0.007 |
| ## | .Item9     | 0.025  | 0.020 | 1.248  | 0.212 |
| ## | .Item19    | 0.029  | 0.015 | 1.928  | 0.054 |
| ## | .Item22    | -0.043 | 0.018 | -2.412 | 0.016 |
| ## | .Item4     | 0.055  | 0.026 | 2.163  | 0.031 |
| ## | .Item12 ~~ |        |       |        |       |
| ## | .Item55    | -0.024 | 0.019 | -1.276 | 0.202 |
| ## | .Item28    | 0.016  | 0.020 | 0.800  | 0.424 |
| ## | .Item13 ~~ |        |       |        |       |
| ## | .Item26    | 0.034  | 0.012 | 2.752  | 0.006 |
| ## | .Item55    | 0.023  | 0.023 | 1.029  | 0.303 |
| ## | .Item4     | 0.045  | 0.024 | 1.853  | 0.064 |
| ## | .Item8     | -0.049 | 0.023 | -2.113 | 0.035 |
| ## | .Item38    | -0.035 | 0.022 | -1.574 | 0.115 |
| ## | .Item14 ~~ |        |       |        |       |

|    |           |        |       |        |       |
|----|-----------|--------|-------|--------|-------|
| ## | .Item9    | -0.050 | 0.020 | -2.461 | 0.014 |
| ## | .Item23   | -0.022 | 0.013 | -1.727 | 0.084 |
| ## | .Item26   | 0.031  | 0.014 | 2.302  | 0.021 |
| ## | .Item20   | -0.020 | 0.019 | -1.041 | 0.298 |
| ## | .Item7    | 0.047  | 0.020 | 2.302  | 0.021 |
| ## | .Item36   | 0.031  | 0.018 | 1.767  | 0.077 |
| ## | .Item21 ~ |        |       |        |       |
| ## | .Item20   | 0.047  | 0.019 | 2.423  | 0.015 |
| ## | .Item22   | 0.070  | 0.017 | 3.999  | 0.000 |
| ## | .Item38   | 0.051  | 0.023 | 2.173  | 0.030 |
| ## | .Item28   | -0.031 | 0.023 | -1.327 | 0.185 |
| ## | .Item1 ~  |        |       |        |       |
| ## | .Item9    | 0.056  | 0.018 | 3.077  | 0.002 |
| ## | .Item16   | 0.029  | 0.018 | 1.553  | 0.120 |
| ## | .Item23   | -0.014 | 0.011 | -1.347 | 0.178 |
| ## | .Item22   | -0.052 | 0.015 | -3.391 | 0.001 |
| ## | .Item3    | 0.012  | 0.020 | 0.620  | 0.535 |
| ## | .Item4    | 0.004  | 0.021 | 0.183  | 0.855 |
| ## | .Item38   | -0.060 | 0.021 | -2.833 | 0.005 |
| ## | .Item27   | 0.038  | 0.019 | 1.971  | 0.049 |
| ## | .Item9 ~  |        |       |        |       |
| ## | .Item26   | -0.050 | 0.013 | -3.732 | 0.000 |
| ## | .Item19   | 0.026  | 0.015 | 1.707  | 0.088 |
| ## | .Item20   | 0.027  | 0.021 | 1.308  | 0.191 |
| ## | .Item55   | -0.051 | 0.023 | -2.267 | 0.023 |
| ## | .Item8    | 0.038  | 0.025 | 1.519  | 0.129 |
| ## | .Item16 ~ |        |       |        |       |
| ## | .Item29   | -0.061 | 0.014 | -4.333 | 0.000 |
| ## | .Item20   | -0.034 | 0.020 | -1.713 | 0.087 |
| ## | .Item38   | -0.053 | 0.025 | -2.107 | 0.035 |
| ## | .Item23 ~ |        |       |        |       |
| ## | .Item24   | 0.060  | 0.011 | 5.365  | 0.000 |
| ## | .Item26   | 0.036  | 0.011 | 3.185  | 0.001 |
| ## | .Item22   | 0.020  | 0.012 | 1.685  | 0.092 |
| ## | .Item3    | -0.035 | 0.014 | -2.434 | 0.015 |
| ## | .Item4    | -0.037 | 0.017 | -2.176 | 0.030 |
| ## | .Item27   | -0.003 | 0.017 | -0.156 | 0.876 |
| ## | .Item28   | 0.022  | 0.017 | 1.245  | 0.213 |
| ## | .Item24 ~ |        |       |        |       |
| ## | .Item26   | 0.004  | 0.010 | 0.380  | 0.704 |
| ## | .Item4    | -0.065 | 0.018 | -3.643 | 0.000 |
| ## | .Item6    | 0.019  | 0.012 | 1.619  | 0.105 |
| ## | .Item36   | 0.030  | 0.011 | 2.649  | 0.008 |
| ## | .Item26 ~ |        |       |        |       |
| ## | .Item22   | -0.036 | 0.013 | -2.860 | 0.004 |
| ## | .Item55   | 0.041  | 0.015 | 2.648  | 0.008 |
| ## | .Item27   | 0.071  | 0.017 | 4.222  | 0.000 |
| ## | .Item36   | 0.009  | 0.012 | 0.742  | 0.458 |
| ## | .Item29 ~ |        |       |        |       |
| ## | .Item6    | -0.028 | 0.012 | -2.260 | 0.024 |
| ## | .Item8    | -0.056 | 0.017 | -3.284 | 0.001 |

|    |                  |          |         |         |         |
|----|------------------|----------|---------|---------|---------|
| ## | .Item38          | 0.004    | 0.016   | 0.222   | 0.824   |
| ## | .Item19 ~~       |          |         |         |         |
| ## | .Item20          | 0.037    | 0.018   | 2.054   | 0.040   |
| ## | .Item22          | 0.016    | 0.015   | 1.052   | 0.293   |
| ## | .Item55          | -0.050   | 0.019   | -2.590  | 0.010   |
| ## | .Item3           | 0.054    | 0.017   | 3.105   | 0.002   |
| ## | .Item6           | 0.036    | 0.013   | 2.639   | 0.008   |
| ## | .Item20 ~~       |          |         |         |         |
| ## | .Item27          | 0.093    | 0.024   | 3.831   | 0.000   |
| ## | .Item22 ~~       |          |         |         |         |
| ## | .Item55          | -0.076   | 0.023   | -3.362  | 0.001   |
| ## | .Item27          | -0.073   | 0.022   | -3.289  | 0.001   |
| ## | .Item36          | 0.017    | 0.017   | 0.973   | 0.331   |
| ## | Finance ~~       |          |         |         |         |
| ## | Advice           | 0.743    | 0.038   | 19.481  | 0.000   |
| ## | F.Support        | 0.777    | 0.037   | 21.281  | 0.000   |
| ## | F.Involvement    | 0.551    | 0.044   | 12.565  | 0.000   |
| ## | Awareness        | 0.709    | 0.037   | 19.300  | 0.000   |
| ## | Consult          | 0.806    | 0.038   | 21.349  | 0.000   |
| ## | Symptom          | 0.552    | 0.048   | 11.549  | 0.000   |
| ## | Complementary    | 0.608    | 0.041   | 14.673  | 0.000   |
| ## | Advice ~~        |          |         |         |         |
| ## | F.Support        | 0.681    | 0.047   | 14.578  | 0.000   |
| ## | F.Involvement    | 0.538    | 0.051   | 10.585  | 0.000   |
| ## | Awareness        | 0.905    | 0.030   | 30.615  | 0.000   |
| ## | Consult          | 0.842    | 0.040   | 20.900  | 0.000   |
| ## | Symptom          | 0.550    | 0.053   | 10.393  | 0.000   |
| ## | Complementary    | 0.767    | 0.038   | 20.170  | 0.000   |
| ## | F.Support ~~     |          |         |         |         |
| ## | F.Involvement    | 0.716    | 0.041   | 17.571  | 0.000   |
| ## | Awareness        | 0.680    | 0.043   | 15.680  | 0.000   |
| ## | Consult          | 0.804    | 0.044   | 18.472  | 0.000   |
| ## | Symptom          | 0.750    | 0.043   | 17.432  | 0.000   |
| ## | Complementary    | 0.569    | 0.052   | 11.021  | 0.000   |
| ## | F.Involvement ~~ |          |         |         |         |
| ## | Awareness        | 0.636    | 0.042   | 15.278  | 0.000   |
| ## | Consult          | 0.755    | 0.041   | 18.274  | 0.000   |
| ## | Symptom          | 0.641    | 0.045   | 14.386  | 0.000   |
| ## | Complementary    | 0.444    | 0.052   | 8.510   | 0.000   |
| ## | Awareness ~~     |          |         |         |         |
| ## | Consult          | 0.907    | 0.033   | 27.188  | 0.000   |
| ## | Symptom          | 0.666    | 0.045   | 14.817  | 0.000   |
| ## | Complementary    | 0.704    | 0.036   | 19.540  | 0.000   |
| ## | Consult ~~       |          |         |         |         |
| ## | Symptom          | 0.688    | 0.048   | 14.388  | 0.000   |
| ## | Complementary    | 0.705    | 0.044   | 15.953  | 0.000   |
| ## | Symptom ~~       |          |         |         |         |
| ## | Complementary    | 0.381    | 0.058   | 6.598   | 0.000   |
| ## |                  |          |         |         |         |
| ## | Variances:       |          |         |         |         |
| ## |                  | Estimate | Std.Err | z-value | P(> z ) |

|    |               |       |       |        |       |
|----|---------------|-------|-------|--------|-------|
| ## | .Item18       | 0.554 | 0.043 | 12.936 | 0.000 |
| ## | .Item25       | 0.199 | 0.039 | 5.067  | 0.000 |
| ## | .Item51       | 0.686 | 0.057 | 12.119 | 0.000 |
| ## | .Item52       | 0.320 | 0.041 | 7.868  | 0.000 |
| ## | .Item53       | 0.759 | 0.063 | 12.064 | 0.000 |
| ## | .Item54       | 0.584 | 0.046 | 12.706 | 0.000 |
| ## | .Item31       | 0.225 | 0.019 | 11.684 | 0.000 |
| ## | .Item33       | 0.273 | 0.023 | 11.987 | 0.000 |
| ## | .Item34       | 0.256 | 0.022 | 11.682 | 0.000 |
| ## | .Item35       | 0.170 | 0.016 | 10.686 | 0.000 |
| ## | .Item37       | 0.453 | 0.035 | 12.804 | 0.000 |
| ## | .Item39       | 0.620 | 0.050 | 12.401 | 0.000 |
| ## | .Item40       | 0.615 | 0.052 | 11.810 | 0.000 |
| ## | .Item41       | 0.336 | 0.032 | 10.447 | 0.000 |
| ## | .Item42       | 0.373 | 0.034 | 11.119 | 0.000 |
| ## | .Item46       | 0.607 | 0.056 | 10.919 | 0.000 |
| ## | .Item48       | 0.493 | 0.041 | 11.960 | 0.000 |
| ## | .Item50       | 0.441 | 0.035 | 12.552 | 0.000 |
| ## | .Item11       | 0.343 | 0.034 | 10.104 | 0.000 |
| ## | .Item12       | 0.217 | 0.023 | 9.244  | 0.000 |
| ## | .Item13       | 0.276 | 0.028 | 9.919  | 0.000 |
| ## | .Item14       | 0.367 | 0.030 | 12.133 | 0.000 |
| ## | .Item21       | 0.345 | 0.028 | 12.132 | 0.000 |
| ## | .Item1        | 0.310 | 0.024 | 12.892 | 0.000 |
| ## | .Item9        | 0.380 | 0.031 | 12.180 | 0.000 |
| ## | .Item16       | 0.399 | 0.032 | 12.631 | 0.000 |
| ## | .Item23       | 0.179 | 0.016 | 11.338 | 0.000 |
| ## | .Item24       | 0.170 | 0.014 | 11.801 | 0.000 |
| ## | .Item26       | 0.175 | 0.015 | 11.460 | 0.000 |
| ## | .Item29       | 0.187 | 0.017 | 11.121 | 0.000 |
| ## | .Item19       | 0.206 | 0.019 | 10.842 | 0.000 |
| ## | .Item20       | 0.408 | 0.034 | 11.876 | 0.000 |
| ## | .Item22       | 0.317 | 0.026 | 12.015 | 0.000 |
| ## | .Item55       | 0.483 | 0.042 | 11.408 | 0.000 |
| ## | .Item3        | 0.490 | 0.041 | 11.867 | 0.000 |
| ## | .Item4        | 0.626 | 0.050 | 12.444 | 0.000 |
| ## | .Item6        | 0.284 | 0.025 | 11.194 | 0.000 |
| ## | .Item7        | 0.350 | 0.033 | 10.486 | 0.000 |
| ## | .Item8        | 0.594 | 0.047 | 12.602 | 0.000 |
| ## | .Item38       | 0.551 | 0.044 | 12.395 | 0.000 |
| ## | .Item27       | 0.349 | 0.046 | 7.527  | 0.000 |
| ## | .Item28       | 0.448 | 0.051 | 8.783  | 0.000 |
| ## | .Item36       | 0.337 | 0.028 | 11.954 | 0.000 |
| ## | Finance       | 1.000 |       |        |       |
| ## | Advice        | 1.000 |       |        |       |
| ## | F.Support     | 1.000 |       |        |       |
| ## | F.Involvement | 1.000 |       |        |       |
| ## | Awareness     | 1.000 |       |        |       |
| ## | Consult       | 1.000 |       |        |       |
| ## | Symptom       | 1.000 |       |        |       |
| ## | Complementary | 1.000 |       |        |       |



### 3. Reliability

#### 3.1 Component 1

##### Reliability Statistics

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .769             | .770   | 6          |

##### Scale Statistics

| Mean  | Variance | Std. Deviation | N of Items |
|-------|----------|----------------|------------|
| 16.75 | 14.269   | 3.777          | 6          |

#### 3.2 Component 2

##### Reliability Statistics

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .789             | .793   | 5          |

##### Scale Statistics

| Mean  | Variance | Std. Deviation | N of Items |
|-------|----------|----------------|------------|
| 16.46 | 6.192    | 2.488          | 5          |

#### 3.3 Component 3

##### Reliability Statistics

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .795             | .799   | 7          |

##### Scale Statistics

| Mean  | Variance | Std. Deviation | N of Items |
|-------|----------|----------------|------------|
| 18.95 | 16.763   | 4.094          | 7          |

## 3.4 Component 4

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .817             | .826   | 7          |

**Scale Statistics**

| Mean  | Variance | Std. Deviation | N of Items |
|-------|----------|----------------|------------|
| 23.96 | 10.070   | 3.173          | 7          |

## 3.5 Component 5

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .817             | .815   | 5          |

**Scale Statistics**

| Mean  | Variance | Std. Deviation | N of Items |
|-------|----------|----------------|------------|
| 15.09 | 8.872    | 2.979          | 5          |

## 3.6 Component 6

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .705             | .720   | 4          |

**Scale Statistics**

| Mean  | Variance | Std. Deviation | N of Items |
|-------|----------|----------------|------------|
| 11.97 | 5.084    | 2.255          | 4          |

## 3.7 Component 7

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .808             | .813   | 3          |

**Scale Statistics**

| Mean | Variance | Std. Deviation | N of Items |
|------|----------|----------------|------------|
| 8.45 | 7.006    | 2.647          | 3          |

## 3.8 Component 8

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .741             | .745   | 6          |

**Scale Statistics**

| Mean  | Variance | Std. Deviation | N of Items |
|-------|----------|----------------|------------|
| 16.50 | 11.225   | 3.350          | 6          |

## 3.9 SCNS-TBC Version

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .941             | .944   | 43         |

**Scale Statistics**

| Mean   | Variance | Std. Deviation | N of Items |
|--------|----------|----------------|------------|
| 128.13 | 354.895  | 18.839         | 43         |



**Appendix K**  
**Proposal approval**



ประกาศ

คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย  
เรื่อง การอนุมัติหัวข้อวิทยานิพนธ์นิพนธ์ ครั้งที่ 10/2558 ประจำปีการศึกษา 2558

นิสิตผู้ทำวิจัยและอาจารย์ที่ปรึกษาวิทยานิพนธ์

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| กรรมการ               | รองศาสตราจารย์ ดร. ศิริชัย กาญจนवासี   |
| กรรมการภายนอก         | ผู้ช่วยศาสตราจารย์ ดร. วันทนา มณีศรีวงศ์กุล  |
| ชื่อหัวข้อวิทยานิพนธ์ | การพัฒนาเครื่องมือแบบประเมินความต้องการการดูแลสนับสนุนของหญิงไทยที่เป็นมะเร็งเต้านมขณะรับการรักษาเคมีบำบัด<br>THE DEVELOPMENT OF SUPPORTIVE CARE NEEDS SCALE FOR THAI WOMEN WITH BREAST CANCER UNDERGOING CHEMOTHERAPY |
| ครั้งที่อนุมัติ       | 10/2558  |
| ระดับ                 | ปริญญาเอก  |

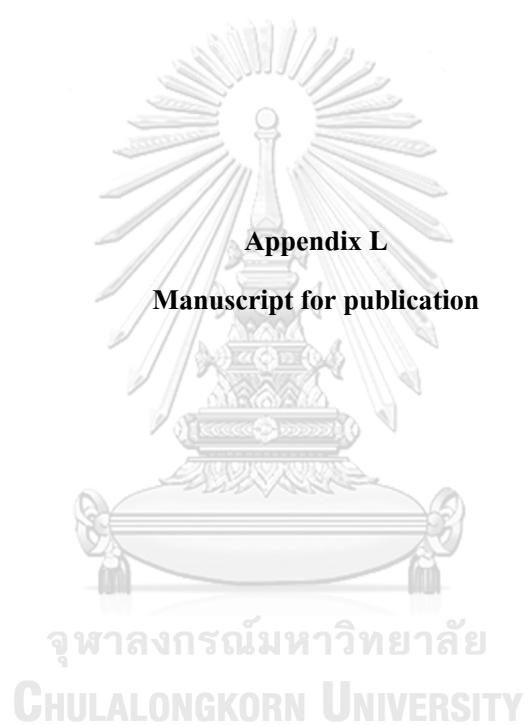
จากมติคณะกรรมการบริหารคณะพยาบาลศาสตร์ ครั้งที่ 10/2559 วันที่ 26 กรกฎาคม 2559

ประกาศ ณ วันที่ 29 กรกฎาคม พ.ศ. 2559

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คณบดีคณะพยาบาลศาสตร์





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## Supportive care needs: An aspect of Thai women with breast cancer undergoing chemotherapy

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### ARTICLE INFO

#### Keywords:

Supportive care needs  
Breast cancer  
Chemotherapy  
Qualitative study

### ABSTRACT

**Purpose:** This study was conducted to explore supportive care needs of Thai women with breast cancer undergoing chemotherapy.

**Methods:** Through qualitative interviews, a convenience sample of ten women with invasive and advanced invasive breast cancer who were undergoing chemotherapy were interviewed. Treatment for all women took place at a regional hospital in lower northern Thailand. Ten participants were interviewed, some more than once, for a total of 18 interviews. A qualitative approach with a semi-structured interview guideline was used in data collection. Content analysis was used to analyze the data.

**Results:** Four major themes were found: 1) the need for physical comfort and health safety, 2) the need for encouragement, 3) the need for solution of financial problems, and 4) the need for communication and useful information. This qualitative investigation found that supportive care needs of Thai women with breast cancer undergoing chemotherapy are essential for nurses to know in order to provide high quality care.

**Conclusions:** Improvement of supportive care quality for women with breast cancer who are undergoing chemotherapy in Thai culture should include: 1) access to supportive care needs assessment, 2) proactive dissemination of necessary information for better management of their lives, 3) aids to daily living and psychosocial support, and 4) facilitation of easy access to welfare and finance help. Provision of supportive care from both families and health care teams could improve the quality of life and so ease the women's lives for Thai women with breast cancer undergoing chemotherapy.

### 1. Introduction

In Thailand, the prevalence of women with breast cancer increases every year. There is a growing population of patients and survivors in need of care (Kotepui and Chupeerach, 2013). Evidence indicates breast cancer is a chronic illness that affects many individuals and is described by many as one of the most stressful times in their lives (Akechi et al., 2011; Arman et al., 2002; Burgess et al., 2005; Thompson et al., 2013). Although breast cancer may be curable nowadays, women still have deep-seated fears once they have been diagnosed. For many, a diagnosis of breast cancer still represents pain, suffering, and death. And, women with breast cancer often face a future of uncertainty and unpredictable treatment (Grassi et al., 2005; Lim et al., 2013). Evidence also points out that during the illness trajectory of breast cancer, new demands for help or support may arise. Thus, the women with breast cancer may have needs for help and assistance from others (Akechi et al., 2011; Brant et al., 2011; Lai et al., 2017; Wannapornsiri, 2003; Yamagishi

et al., 2009). Therefore, an understanding of supportive care needs is essential to achieve good quality care for women with breast cancer undergoing chemotherapy (Asadi-Lari et al., 2004; Brédart et al., 2013; Fiszler et al., 2014; Harrison et al., 2009; Lai et al., 2017).

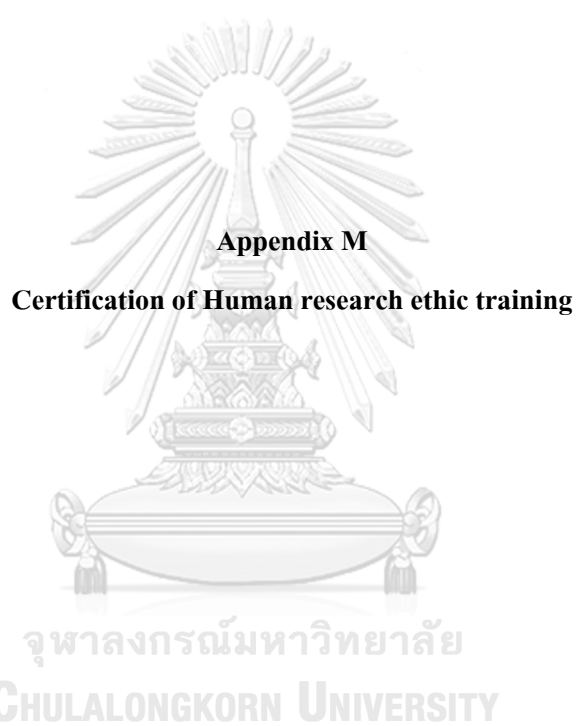
The concept of Supportive Care Needs is an important notion that nursing researchers are studying from many different perspectives. There is clearly a need to understand what needs patients with cancer identify (Fitch et al., 2008). There has been a focus on evaluating the supportive care needs that cancer patients identify including levels of needs for assistance through a list of issues or problems (Boyes et al., 2009; Richardson et al., 2007). Moreover, supportive care needs of cancer patients are individual and the needs tend to change and reoccur over time (Asadi-Lari et al., 2004; Fitch et al., 2008; Harrison et al., 2009; Smith et al., 2014). Almost all types of cancer patients have to face similar major problems. These include fatigue, nausea and vomiting, and pain as well as anxiety, stress, and not knowing the disease trajectory or self-care practices during the period of illness. These all

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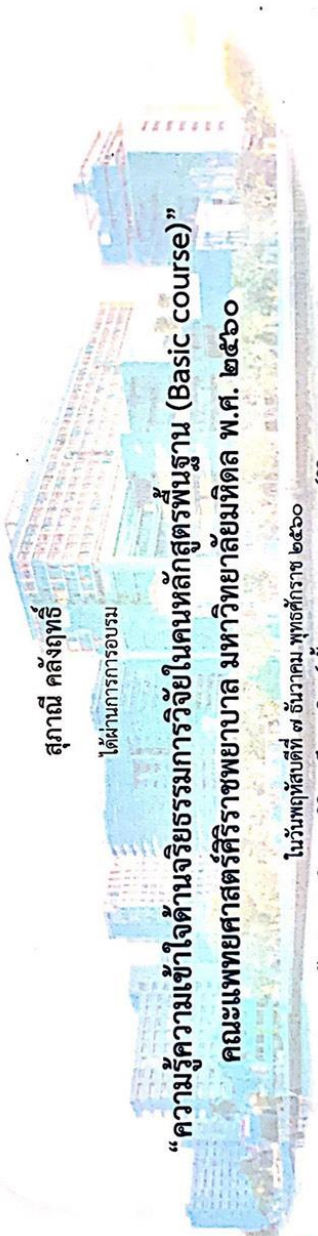




คณะแพทยศาสตร์ศิริราชพยาบาล มหาวิทยาลัยมหิดล  
ขอขอบพระภาคเกียรติคุณนี้ไว้เพื่อแสดงว่า

สุภาณี คลังฤทธิ์  
ได้ผ่านการการอบรม

**“ความรู้ความเข้าใจด้านจริยธรรมการวิจัยในคนหลักสูตรพื้นฐาน (Basic course)”**  
**คณะแพทยศาสตร์ศิริราชพยาบาล มหาวิทยาลัยมหิดล พ.ศ. ๒๕๖๐**



ในวันพฤหัสบดีที่ ๗ ธันวาคม พุทธศักราช ๒๕๖๐  
ณ ห้องประชุมอภิตยสารภีดิศคุณ ดิถยนิมรินทร์ ชั้น ๗ คณะแพทยศาสตร์ศิริราชพยาบาล

ขอให้ความรู้และประสบการณ์ที่ได้รับไปใช้เป็นหลักในการปฏิบัติเพื่อให้เกิดประโยชน์สูงสุด  
ให้ไว้ ณ วันพฤหัสบดีที่ ๗ ธันวาคม พุทธศักราช ๒๕๖๐

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*ม.จ.น.อ.*

(ศาสตราจารย์ ดร. นายแพทย์ประสิทธิ์ วัฒนาภา)  
คณบดี คณะแพทยศาสตร์ศิริราชพยาบาล



**Appendix N**

**Certification of chemotherapy Training**

จุฬาลงกรณ์มหาวิทยาลัย  
**CHULALONGKORN UNIVERSITY**



### สภาการพยาบาล

หนังสือรับรองฉบับนี้ให้ใช้เพื่อแสดงว่า

นางสุดาสุภาณี ศัลยรักษ์

ผู้ประกอบวิชาชีพ การพยาบาล หรือการพยาบาลและการดุงครรภ์ ซึ่งหนึ่ง ในใบอนุญาตเลขที่ ๔๕๑๑๙๔๕๓๑

ได้รับการรับรองว่าเป็นผู้ผ่านการอบรม หลักสูตรการให้ยาเคมีบำบัด

มีสิทธิประกอบวิชาชีพการพยาบาลตามเจตจำนงและเจตนาในกรมระกอบวิชาชีพการพยาบาลและการดุงครรภ์

ภายใต้กฎหมายและข้อบังคับของสภาการพยาบาล

ออกให้ ณ วันที่ ๒๙ เดือน ธันวาคม พุทธศักราช ๒๕๖๐

อังกษ สิบงษ์

เลขาธิการสภาการพยาบาล

*(Signature)*

นายกสภาการพยาบาล

## VITA

**NAME** Miss Supanee Klungrit

**DATE OF BIRTH** 3 August 1973

**PLACE OF BIRTH** Tak

**INSTITUTIONS ATTENDED** Bachelor of Nursing Science from Boromrajonani College of Nursing Buddhachinaraj Phitsanulok in 1996  
Master of Nursing Science (Adult Nursing), Khon Kean University in 2001.  
Specialty Program in Nurse Practitioner (Primary Medical Care) Faculty of Medicine Ramathibodi Hospital, Mahidol University in 2006  
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