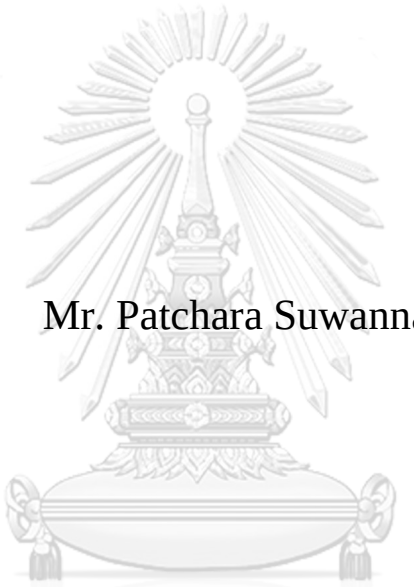
MENTAL HEALTH AND EMPLOYMENT STATUS: EVIDENCE FROM THAILAND

Mr. Patchara Suwannasin



จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Science in Health Economics and Health Care Management
Common Course
FACULTY OF ECONOMICS
Chulalongkorn University
Academic Year 2019
Copyright of Chulalongkorn University

สุขภาพจิตและสถานะการจ้างงาน: หลักฐานจากประเทศไทย

นายพชร สุวรรณศิลป์

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต
สาขาวิชาเศรษฐศาสตร์สาธารณสุขและการจัดการบริการสุขภาพ ไม่สังกัดภาควิชา/เทียบเท่า
คณะเศรษฐศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2562
ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

Thesis Title	MENTAL HEALTH AND EMPLOYMENT STATUS: EVIDENCE FROM THAILAND
By	Mr. Patchara Suwannasin
Field of Study	Health Economics and Health Care Management
Thesis Advisor	Associate Professor KANNIKA DAMRONGPLASIT, Ph.D.

Accepted by the FACULTY OF ECONOMICS, Chulalongkorn University in Partial Fulfillment of the Requirement for the Master of Science

..... Dean of the FACULTY OF ECONOMICS
(Associate Professor SITTIDAJ PONGKIJVORASIN, Ph.D.)

THESIS COMMITTEE

..... Chairman
(Associate Professor NOPPHOL WITVORAPONG, Ph.D.)

..... Thesis Advisor
(Associate Professor KANNIKA DAMRONGPLASIT, Ph.D.)

..... External Examiner
(Associate Professor Kiriya Kulkolkarn, Ph.D.)

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

พชร สุวรรณศิลป์ : สุขภาพจิตและสถานะการจ้างงาน: หลักฐานจากประเทศไทย. (MENTAL HEALTH AND EMPLOYMENT STATUS: EVIDENCE FROM THAILAND) อ.ที่ปรึกษาหลัก : รศ. ดร.กรรณิการ์ ดำรงค์พลาสิทธิ์

สุขภาพจิตและความผิดปกติทางจิตเป็นประเด็นสำคัญที่เกิดขึ้นทั่วโลกอย่างต่อเนื่อง ไม่ว่าจะเป็นการเพิ่มขึ้นของปัญหาภาวะซึมเศร้า หรืออัตราการจบชีวิตด้วยตนเองที่ยังคงพบอยู่ในเกือบทุกประเทศ นอกจากนี้ปัญหาที่เกี่ยวเนื่องกับการจ้างงาน ทั้งปัญหาการว่างงานหรือประเด็นอื่น ๆ ที่เกิดขึ้นในภาคส่วนต่าง ๆของการจ้างงานก็ยังคงปรากฏอยู่ในทุกภาคส่วนเศรษฐกิจไทย ด้วยสถานการณ์ที่เกิดขึ้นทั้งในด้านสุขภาพจิตและการจ้างงานนี้เป็นผลให้ผู้วิจัยเกิดความสนใจศึกษาถึงผลกระทบของการจ้างงานในภาคส่วนต่างๆ ที่มีผลต่อสถานะทางสุขภาพจิต รวมไปถึงปัจจัยทางลักษณะส่วนบุคคลด้วยเช่นกัน อีกทั้งยังมีการศึกษาถึงกลไกที่ส่งผลต่อสุขภาพจิตอันเนื่องมาจากการทำงาน การศึกษาครั้งนี้ดำเนินการวิเคราะห์ผ่านข้อมูลภาคตัดขวางจากชุดข้อมูล การสำรวจ สภาวะสังคม วัฒนธรรมและ สุขภาพจิตประจำปี พ.ศ 2557 โดยข้อมูลดังกล่าวเป็นการสำรวจโดย สำนักงานสถิติแห่งชาติแห่งประเทศไทย ข้อมูลดังกล่าวประกอบไปด้วย ประชากรผู้ที่ไม่ได้ทำงานเป็นจำนวน 9,260 คน (28.09%), ผู้ประกอบอาชีพในภาคเกษตรกรรมจำนวน 11,039 คน (33.48%), ในภาคอุตสาหกรรมจำนวน 2,332 คน (7.07%) และประชาชนผู้ประกอบอาชีพในภาคบริการเป็นจำนวน 10,339 คน (31.36%) ในส่วนของตัวแปรสภาวะสุขภาพจิตนั้น มีประการเมินผลโดยใช้ แบบทดสอบดัชนีชี้วัดสุขภาพจิตคนไทย ฉบับสั้น 15 คำถาม (TMHI-15) ซึ่งให้ผลลัพธ์ของระดับสุขภาพจิตได้เป็น 3 ได้แก่ กลุ่มบุคลลผู้มีสุขภาพจิตต่ำกว่าคนทั่วไป, กลุ่มบุคคลผู้มีสุขภาพจิตเท่ากับคนทั่วไป และ กลุ่มบุคคลผู้มีสุขภาพจิตดีกว่าคนทั่วไป ในส่วนของการวิเคราะห์ การศึกษานี้ได้ใช้สถิติเชิงพรรณนาเพื่ออธิบายถึงลักษณะของกลุ่มตัวอย่างที่ศึกษา รวมไปถึงความสัมพันธ์ระหว่างตัวแปรที่น่าสนใจ อีกทั้งมีการใช้แบบจำลองถดถอยแบบลอจิสติกเชิงอันดับ เพื่อการพยากรณ์ตัวแบบสภาวะทางสุขภาพจิตสำหรับคนในแต่ละสภาพการณ์การจ้างงาน แล้วจึงมีการวัดการเปลี่ยนแปลงของค่าความน่าจะเป็นที่กลุ่มตัวอย่างจะมีสภาวะสุขภาพจิตระดับต่างๆเมื่อตัวแปรอิสระเปลี่ยนแปลงไป ผลการศึกษาพบว่า กลุ่มตัวอย่างส่วนใหญ่เป็นผู้ที่มีสภาวะสุขภาพจิตอยู่ในระดับเท่ากับคนทั่วไป (56.6%), โดยเป็นเพศหญิงถึง 59.2%, มีอายุอยู่ในช่วงตั้งแต่ 40 ปีเป็นต้นไป (72.17%), ได้มีการสมรสแล้วถึง 67.9% และอาศัยอยู่ในพื้นที่เขตเมืองเป็นหลัก (54.6%) โดยค้นพบว่า สำหรับสถานะการจ้างงาน การเป็นบุคคลผู้ไม่ได้ทำงานหรือประกอบอาชีพในภาคเกษตรกรรมมีความสัมพันธ์เชิงลบอย่างมีนัยยะสำคัญต่อการมีสุขภาพจิตที่ดี โดยผ่านกลไกความพึงพอใจในรายได้ของตน อีกทั้งยังพบว่า การเป็นสตรีเพศ การเป็นผู้นำในครัวเรือน หรือ การมีรายได้ที่ไม่เพียงพอนั้น ส่งผลเชิงลบต่อการมีสุขภาพจิตที่ดีได้เช่นกัน จากผลการศึกษานี้ การให้ความสำคัญและสนับสนุนต่อภาคเกษตรกรรมของไทย ควรเป็นเรื่องที่รัฐบาลสมควรตระหนักเป็นอย่างยิ่ง ทั้งในด้านนัยสำคัญของผลกระทบที่มีต่อสุขภาพจิต รวมไปถึงการที่ประเทศไทยเป็นประเทศเกษตรกรรมที่สำคัญรายหนึ่งของโลก อีกทั้งปัญหาสุขภาพจิตที่เป็นผลมาจากการไม่ได้ทำงาน ซึ่งสามารถสร้างผลกระทบต่อคุณภาพชีวิตของตัวผู้ที่ไม่ได้ทำงานจนอาจนำไปสู่ปัญหาต่อสังคมนั้นๆได้ และท้ายสุด ประเด็นทางด้านปัญหาความไม่เพียงพอของรายได้ที่มีผลต่อสุขภาพจิต ซึ่งสามารถสะท้อนถึงปัญหาค่าครองชีพที่ยังคงมีอยู่และควรได้แก้ไขจากผู้มีส่วนเกี่ยวข้อง

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

สาขาวิชา	เศรษฐศาสตร์สาธารณสุขและการจัดการบริการสุขภาพ	ลายมือชื่อนิสิต .....
ปีการศึกษา	2562	ลายมือชื่อ อ.ที่ปรึกษาหลัก .....

6284139029 : MAJOR HEALTH ECONOMICS AND HEALTH CARE MANAGEMENT
KEYWORD: mental health, employment status, Thailand

Patchara Suwannasin : MENTAL HEALTH AND EMPLOYMENT STATUS: EVIDENCE FROM THAILAND. Advisor: Assoc. Prof. KANNIKA DAMRONGPLASIT, Ph.D.

Mental health and mental disorder are significantly considered to be a worldwide issue nowadays such as depression and suicidal. Moreover, the problem of employment still occurs as an aspect of unemployment or employment status issues in those people who work in each economic sector. The objective of the study was to assess the impact of employment status on mental health and to investigate the relationship between personal characteristics and mental health in Thailand. Moreover, the channels that employment may affect mental health also were investigated in this study. A cross-sectional data, 2014 Thailand survey on conditions of society, culture, and mental health (Thai happiness) from the National Statistical Office Thailand, is used for the study. The data were including 9,260 who are not working (28.09%), 11,039 agricultural workers (33.48%), 2,332 industrial workers (7.07%) and 10,339 service workforces (31.36%). For the mental health state, it was measured using the Thai Mental Health Indicator (TMHI) of the SF-15, including good mental health state, normal mental health state, and poor mental health state. Descriptive statistics analysis was used to describe the baseline characteristics of samples and ordered logistic regressions were used to determine the level of mental health state for people in each employment status. Thereafter, marginal effects were computed to obtain the effect of each employment status, socioeconomic-demographic, and community characteristics variable on the probability of each mental health state. The result revealed that the majority of participants have normal mental health state (56.6%), was female (59.2%), aged over 40 years (72.17%), married (67.9%), and lived in urban areas (54.6%). The results show that employment could impact on the mental health in term of not-working people and agriculture employed, which they experienced lower mental health state than people worked in the industrial sector and the main reason that found in this study it is through income mechanism. Additionally, being females, being head of household, and having insufficient income also had a statistically significant negative correlation to good mental health state in Thai people. Regarding the study results, the agricultural sector is the major employment sector in Thailand, encouraging from the Thai government especially agricultural activities could partially improve the mental health of Thai people. The not-working dimension is one of the concerning issues for the government to support, because it can impact a person's standard of living. When those who are not working have a poor mental health state, it may lead to social problems. Also, the Thai government should consider the impact of insufficient income on mental health state as presented in this study by the perception of income.

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Field of Study:	Health Economics and Health Care Management	Student's Signature .....
Academic Year:	2019	Advisor's Signature .....

ACKNOWLEDGEMENTS

First of all, the author would like to express my gratitude to my advisor, Associate Professor Kannika Damrongplasit, Ph.D., for her support, valued comments and patience, without her patience and precious guidance, my work would not be completed.

Secondly, I would also like to express my appreciation to my committee examiner members, to the chairperson and committee, Associate Professor Nopphol Witvorapong, Ph.D. and Associate Professor Kiriya Kulkolkarn, Ph.D. for their valuable guidance during the processing of this thesis.

Thirdly, I would like to extend my thanks to all Professors and staff of Health Economics and Health Care Management Program, Faculty of Economics, Chulalongkorn University.

Finally, my grateful thank goes to my family for their ultimately support everything on my master's degree route.

Patchara Suwannasin

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

ABBREVIATIONS

AHEAD	Assets and Health Dynamic among the Oldest Old
ANOVA	Analysis of Variance
ASEAN	Association of Southeast Asian Nations
BHPS	British Household Panel Survey
CIDI	Composite International Diagnostic Interview
CMD	Common Mental Disorders
CPES	Collaborative Psychiatric Epidemiology Surveys
CSO	Central Statistics Office
DiD	Difference-in-Difference
DSM	Diagnostic and Statistical Manual of Mental Disorders
DSQ	Dimensional Symptom Questionnaire
EA	Enumeration Area
EHIs	European Health Interview Survey
GBD	Global Burden of Disease
GHQ	General Health Questionnaire
HCC	Healthcare for Communities survey
HILDA	Household Income and Labor Dynamics in Australia
HRS	Health and Retirement study
HSCL	Hopkins Symptoms Checklist

CHULALONGKORN UNIVERSITY

ICD	International Statistical Classification of Diseases and Related Health Problems
ICSE	International Classification by Status in Employment
IHME	Institute for Health Metrics and Evaluation
ISCO	International Standard Classification of Occupations
JCQ	Job Content Questionnaire
K10	Kessler Psychological Distress Scale
LR	Likelihood Ratio
MCS	Mental Health Component Summary Score
MDD	Major Depressive Disorder
MH	Mental health
MHI	Mental Health Inventory
MHP	Mental Health Pattern
NCS	National Comorbidity Survey
NHS	National Health Survey
NLSY	National Longitudinal Survey of Youth
NMW	National Minimum Wage
NSO	National Statistical Office
OLS	Ordinary Least Square
PHQ	Patients Health Questionnaire
RE	Role-emotional
RRFS	Rural and Regional Families Survey
SE	Standard Error
SF	Social Functioning
SF-36	Short from of health survey 36 questions
SMEs	Small and Medium sized Enterprises
SMHWB	Survey of Mental Health and Wellbeing
SOEP-IS	Socio-economic Panel Innovation Sample
SRQ	Self-Reporting Questionnaire
SSS	Subjective Social Status
STOU	Sukhothai Thammathirat Open University
TCS	Thai Cohort Study
TMHI	Thai Mental Health Indicator
US	United State
UK	United Kingdom

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

VT	Vitality
WHO	World Health Organization

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

TABLE OF CONTENTS

Page

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

LIST OF TABLES

Page

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

LIST OF FIGURES

Page

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

CHAPTER 1

INTRODUCTION

1.1 Problem and Significance

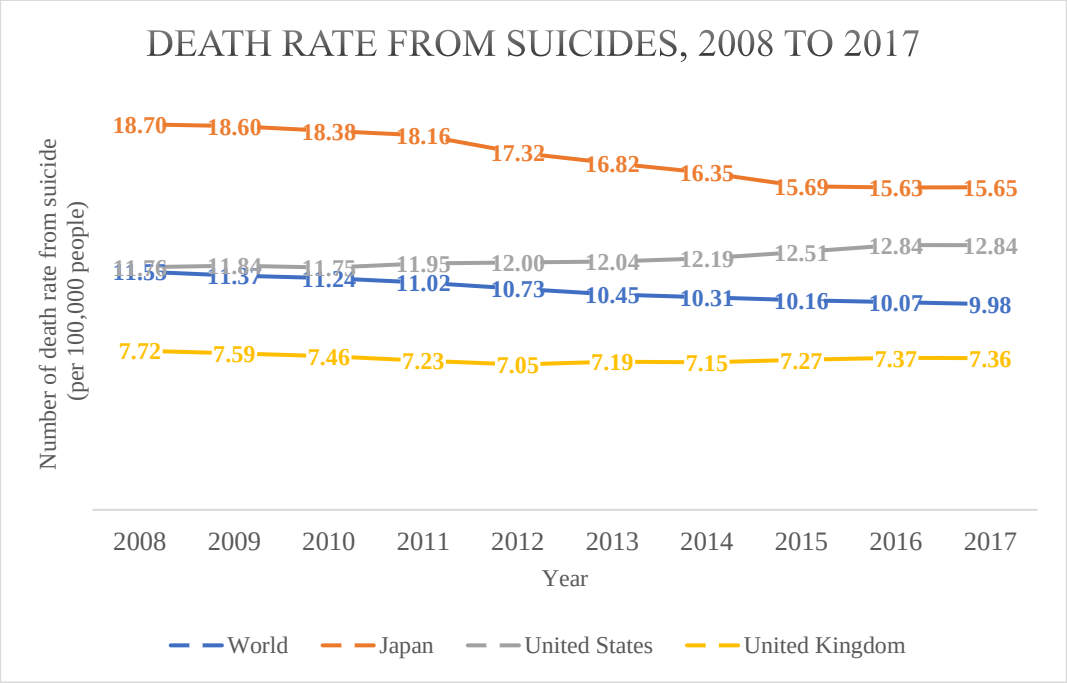
Health, the important element of life, in which the definition of health from World Health Organization (WHO) has defined the meaning of health in the constitution of the World Health Organization in 1948 as follows: “Health means the state of physical and mental integrity including living in a normal society and does not mean only the absence of disease and disability”. Later, at the general assembly of WHO, in May 1998, a resolution was passed to add the term spiritual well-being or spiritual health in the definition of “Health”.

On mental health, an explicitly integration of this definition, which the World Health Organization has defined the mental health is "The health condition in which a person knows their potential can handle stress in life, able to work efficiently with creatively and able benefit society, "(WHO 2001). Moreover, the definition from WHO mental health action plan 2010-2013 on the definition of mental health is “a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community” According to these definition, mental health is therefore the foundation of well-being and effective functioning of individuals and societies.

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Mental health problem can also lead to mental disorder such as depression, bipolar disorder, schizophrenia and other psychoses, dementia, and developmental disorders including autism (WHO,2019). Furthermore, people with a diagnosed mental health problem have been found to be at a higher risk of suicidal thoughts and behavior (Mental Health Foundation, 2019). With the situation of mental health problems can be occur at the national and global levels, in some countries there is some increasing rate of suicidal rate to total population overtime.

Figure 1 The annual number of deaths from suicide per 100,000 people in 2008 to 2017



Source: Institute for Health Metrics and Evaluation (IHME), Global Burden of Disease (GBD)

Figure 1 shows the age-standardized of death rate from suicide, the metric is age-standardized to allow comparisons between countries and over time, in 2008 to 2017. This figure shows that the death rate from suicide around the world was 11.55 per 100,000 people in 2008 and gradually declines to 9.98 per 100,000 people in 2017, even though the numbers have decreased, this is still considered large relation to the whole world population (nearly a million people died from suicide in 2017). At national level, by looking at developed countries in different regions the annual number of deaths from suicide in the United States was 11.76 per 100,000 people in 2008 and continuously rises to 12.84 persons per 100000 population in 2017, which is higher than the world rate.

Besides, for the United Kingdom, the problem of suicide is also found to be quite severe. Although there is rather stable number on death from suicide (around 7 %) and lower than the world death rate, but there is still an increasing number in 2018 at the total of 6,507 suicides that were registered in the UK, 686 more deaths than in 2017 when there were 5,821 deaths (i.e. 11.8% increase) (Office for National Statistics of United Kingdom, 2019). Moreover, since 2012 the death rate of suicide continues to increase, which indicate mental health problems that still exist in the United Kingdom. In addition, in 2018, Theresa May, the former Prime Minister of England, while still holding the position had appointed the world's first minister of suicide prevention, the Health Minister Jackie Doyle-Price with the goal of enhancing education, awareness and mental health support to eliminating the social stigma and the problem of suicide within the country (the *Times* reports, 2018).

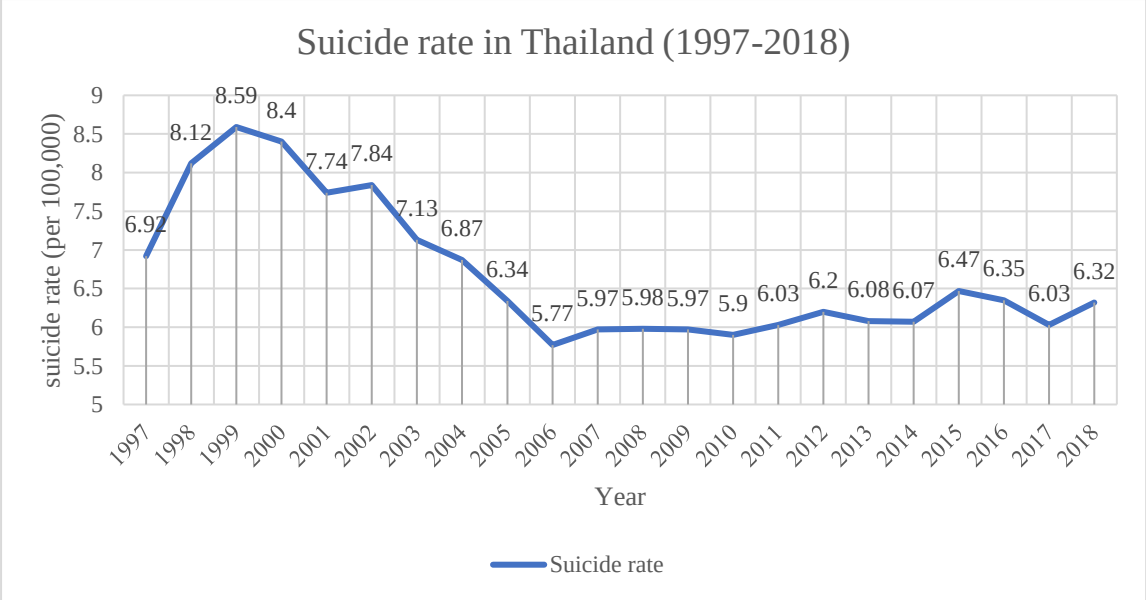
In case of Asia, Japan is well-known for a major suicide country. Japan's suicide numbers peaked in 2008-2009 (i.e. 18.65 per 100,000 people), when the country experienced its worst recession since World War II. Despite noticeably decreasing suicide numbers in recent years, Japan still had one of the highest suicide rates among high-income OECD nations. The main causes that affect suicide in Japan are stress, bullying and family problems, which can be seen as all related to mental health (The standard, 2018). From Figure 1, the number of deaths from suicide per 100,000 people in Japan from 2008 to 2017, which is declining of suicide rate but are still a large proportion for suicide rate especially when compared to other countries like two countries that were referred above (i.e. US and UK). If considering in 2017 from all 3 countries mentioned Japan's suicide rate is the highest with a rate of 15.65 while the United States and United Kingdom are at rates equal to 12.84 and 7.36 per 100,000, respectively.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

These can be seen that mental health problems (in this case, as captured by death rate from suicidal) are continuing a problem in many countries. Thus, mental health is therefore a significant issue presently around the world.

For the current mental health situation in Thailand, there is an increasing awareness of mental health problems especially depression, which is perceived as a major treatable disease, and if not treated, can be severe and lead to suicide (Dr. Kiatphum Wongrachit, 2019). For the suicidal situation in Thailand, the rate of suicide is not high, comparing to the three countries that mentioned before and there is not much fluctuation in the rate overtime. Nevertheless, according to the Suicide Rate reported by department of mental health, Thailand in 2019, Thailand has a suicidal rate of 6.64 people per 100,000 population, which is ranked first among ASEAN countries, ranked 6th in Asia and ranked 32nd in the World from 183 countries. Figure 2 shows the number of suicide rate per 100,000 persons in Thailand from1997 to 2018, which in 1997 Thailand started to experience the financial crisis known as "Tom Yum Kung crisis" which caused a lot of stress among Thai people therefore leading to higher suicide rates in subsequent years (1998 and 1999) . Furthermore, during the past 10 years (2009-2018), Thailand still faces suicide at an average level of 6.112 persons per 100,000 population.

Figure 2 Suicide rate in Thailand (1997-2018)



Source: Thailand Mental health department, 2019

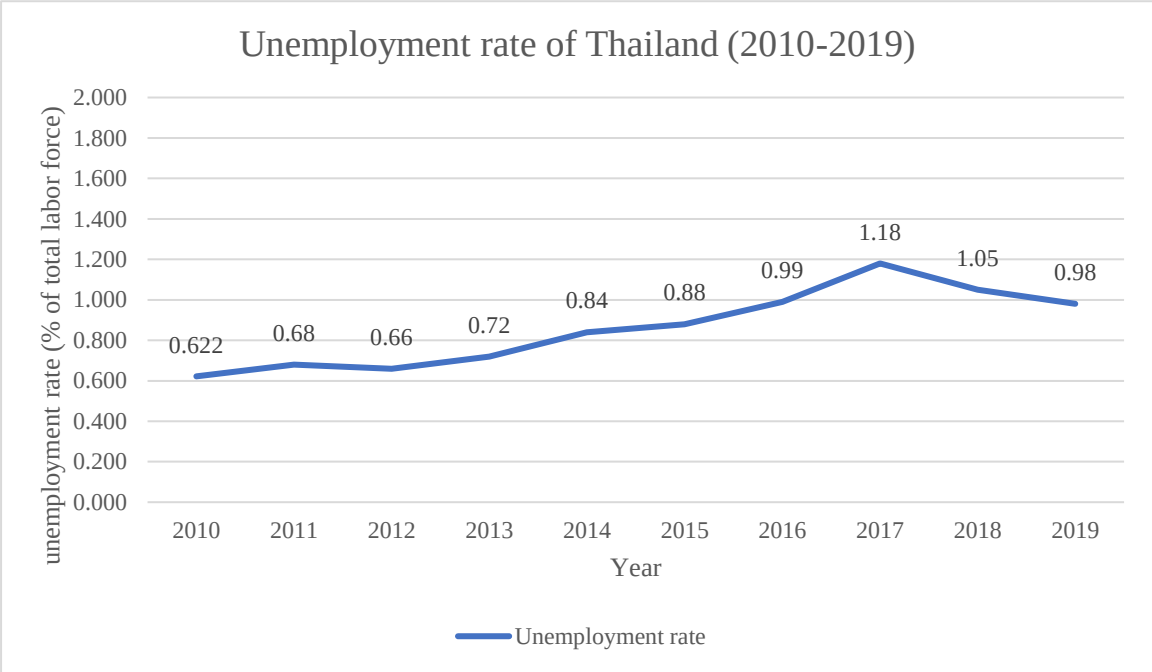
In addition, the “2019 Cigna 360 Well-Being Survey”, an annual survey was made to study people's perceptions and attitudes about health and well-being from Cigna Corporation (a global health services company). It was found that Thailand ranks in the 5th among the country with the highest number of people under stress internationally, equals to 91% of Thai population, which is higher than the average level (84%) (including the sample of 23 countries in all regions around the world).

Also, from the 2015 Thai mental health survey, the Department of Mental Health revealed that the main factors that affect mental health are include gender, marital status, and employment status. The employment status situation is therefore an issue of interest in this research. By investigating unemployment in Thailand in details, there still exists unemployment problems in Thailand. Although from the ranking by the World Bank in 2018 reveals that Thailand’s unemployment rate was 1.1% which is the 9th lowest out of 233 countries worldwide, the unemployed beneficiaries continue to rise each year indicating that there is still unemployed problem presented in Thailand.

Figure 3 shows the number of unemployment rate in Thailand from 2010 to 2019, which ranked by the World Bank in 2018, that was the 9th lowest out of 233 countries. However, there are 2 reasons for this low rate, one is on the definition of unemployment rate utilizing and the other is the structural problems in the Thai labor market that cause the unemployment rate number to inaccurately reflect the actual unemployment condition (Chaidej-akaraku and Sessomboon, 2019).

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Figure 3 Unemployment rate of Thailand (2010-2019)

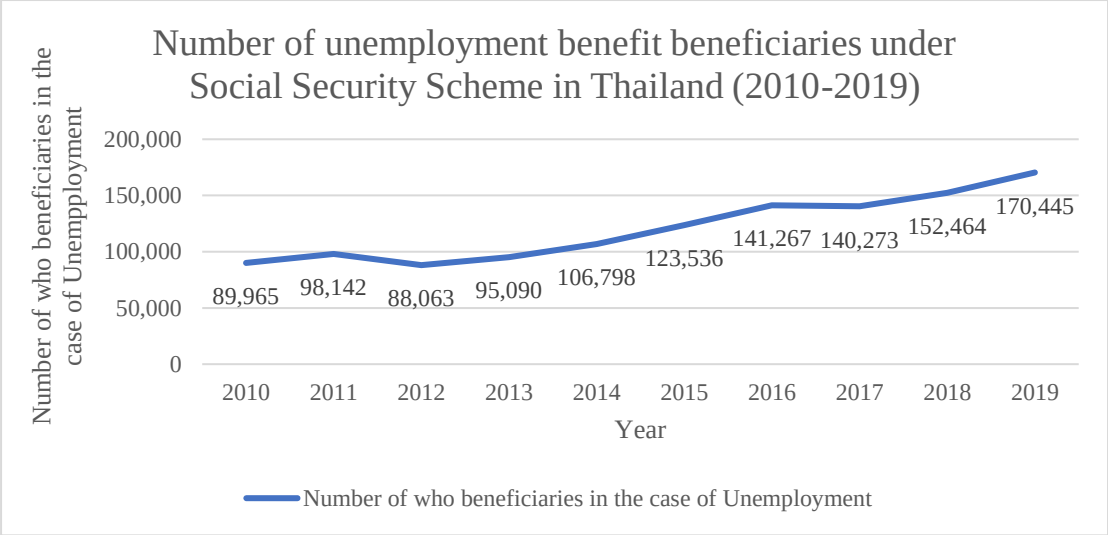


Source: Bank of Thailand, 2020

Figure 4 shows the number of unemployment benefit beneficiaries under social security scheme in the case of unemployment in Thailand from 2010 to 2019. There is continuously increasing numbers of unemployed beneficiaries under the social security scheme, showing that there is increase in unemployment in formal sector in Thailand (i.e. 89,965 people in 2010 and increased to 170,445 people in 2019) even though the unemployment rate is not high. As a result, the unemployment is still a problem in Thailand.

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Figure 4 Number of beneficiaries in the case of unemployment in Thailand (2010-2019)



Source: Bank of Thailand, 2020

With the mental health situation and employment problems occurring in Thailand, the researcher would like to study the relationship between employment status and mental health in Thailand. This research's primary focus is to investigate the link between mental health and employment status in Thailand and the various channel in which employment status may affect mental health state of people in Thailand.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

1.2. Research Questions

Primary research question

- Is there any relationship between employment status and people's mental health in Thailand?

Secondary research question

- What are the determinants that affect the mental health of Thai people?

1.3. Objectives

- To assess the impact of employment status on mental health in Thailand
- To investigate the relationship between socioeconomic and demographic factors and mental health in Thailand

1.4. Hypothesis

1. The mental health of the people not working is worse than the mental health of industrial sector employed people.
2. The mental health of the agriculture sector employed is worse than the mental health of industrial sector employed people.
3. The mental health of male is worse than the mental health of female.
4. People with higher education should have better mental health than those with lower education
5. Higher perception of income is related to better mental health.

1.5. Scope

This study uses the 2014 Thailand survey on conditions of society, culture and mental health (Thai happiness) to investigate the relationship between mental health and employment status. This survey is taken place in October 2014 by the National

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Statistical Office of Thailand, from the sample of approximately 27,000 households in order to understand the state of Thai society regarding behavior, values, culture and also mental health state of Thai people which collects mental health record of people who are 15 years old or above.

For employment status survey, it was also collected in the 2014 survey on conditions of society, culture and mental health (Thai happiness). The data was collected from people aged 15 and over, as well as the criteria of the mental health survey. As a result, this dataset is suitable to be used for investigating the impact employment status on mental health of Thai adults.

1.6. Possible benefits

1) If people not working significantly worsens mental health, this could raise the severity of not working problem. The government can allocate the intervention to reduce the not working rate in order to control the trend of mental health problem.
2) If socioeconomic-demographic factors have the statistically significance effect on mental health, the government can gear proper policy for particular group of people to solve mental health problem.
3) If other employment status such as agriculture sector employment has significant effect on mental health, the government can direct appropriate policy to support particular employment status in order to alleviate mental health problem.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

CHAPTER 2

LITERATURE REVIEW

In this section, researcher will provide definitions of mental health and the measure of mental health in existing literature. Follow by, the researcher will shift towards measures of employment status. Then, researcher will give review of the literature on how employment status and other factors impact mental health.

2.1 Mental health and mental disorder

2.1.1 Definition of Mental Health

From the World Health Organization (WHO), definition on mental health is " a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, work productivity and fruitfully, its also able to make a contribution to his or her community" (2001). According to this definition, mental health is the foundation of well-being and effective function of individuals and societies, which is more than the absence of mental illness from these conditions and abilities, the definition of mental health has value in itself (WHO, 2004). Later, World Health Organization took addition to clarify that mental health and psychiatric disorders are not the opposite. Along with a good mental health does not mean only that the absence of mental disorders (WHO, 2013). Afterwards, there is a draft definition that would like to extent the mental health definition to be more inclusive and avoid restrictive, culture-bound statements and more inclusion of harmony relationship between body and mind, which this definition is "Mental health is a dynamic state of internal equilibrium which enables individuals to use their abilities in harmony with universal values of society. Basic cognitive and social skills; ability to recognize, express and modulate one's own emotions, as well as empathize with others; flexibility and ability to cope with adverse life events and function in social roles; and harmonious relationship between body and mind represent important

components of mental health which contribute, to varying degrees, to the state of internal equilibrium" (Galderisi et al., 2015)

2.1.2 Definition of Mental disorder

From the Mental Health Action Plan 2013-2020, World Health Organizations (WHO) defined the definition of mental disorder as "denote a range of mental and behavioral disorders that fall within the International Statistical Classification of Diseases and Related Health Problems, Tenth revision (ICD-10). These include disorders that cause a high burden of disease such as depression, bipolar affective disorder, schizophrenia, anxiety disorders, dementia, substance use disorders, intellectual disabilities, and developmental and behavioral disorders with onset usually occurring in childhood and adolescence, including autism" (2013). Moreover, common mental disorders can result from stressful experience, but also occur in the absence of such experiences; stressful experiences do not always lead to mental disorders, which means poor mental health that does not reach the threshold for diagnosis as a mental disorder, the less commonly-used term, mental illness (WHO, 2014).

2.1.3 Measure of mental health internationally

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

General Health Questionnaire (GHQ)

The General Health Questionnaire (GHQ) assessment form is developed from Goldberg and Williams (1972) which allows respondents to answer themselves in order to screen mental health problems. GHQ covers four major issues: Unhappiness, Anxiety, Social impairment and Hypochondriasis which GHQ Goldberg scoring uses the GHQ score calculation (0–0–1–1). The full GHQ (GHQ-60) consists of 60 questions and other short versions. including GHQ-30 which is the short form without items relating to physical illness, GHQ-28 for assessing somatic symptoms, anxiety and insomnia, social dysfunction and severe depression and GHQ-12 is quick, reliable and sensitive short form. GHQ is just a screening for mental health problems and only shows the probability of having a psychiatric disorder. In order to be diagnosed,

assistance needs to be taken to take a history, as well as examine additional symptoms (department of mental health Thailand, 2002).

The following are some of examples of GHQ Questionnaire: (1) Have you recently been able to concentrate on what you're doing?, (2) Have you recently lost much sleep over worry?, (3) Have you recently been able to enjoy your normal day-to-day activities?, (4) Have you recently been able to face up to your problems?, (5) Have you recently been feeling reasonable happy, all thing considered?.

In the scoring part are ranges from a 'better than normal', 'same as usual', 'more than usual' and 'much more than usual'. Based on the scoring GHQ Goldberg will make each form of GHQ result equals to the number of questions. For example, for GHQ12, the result will equal to a maximum of 12 and for GHQ 28 the result will be equals to a maximum of 28. The more result you get the more probability the person is got the mental health issue, but the result cannot tell which disorder of mental health the person got.

For each threshold of GHQ are as followed:

1. GHQ12 max score is 12 if the respondent gets more than 2 then the result is response to that respondent is not normal
2. GHQ28 max score is 28 if the respondent gets more than 6 then the result is response to that respondent is not normal
3. GHQ30 max score is 30 if the respondent gets more than 4 then the result is response to that respondent is not normal
4. GHQ60 max score is 60 if the respondent gets more than 12 then the result is response to that respondent is not normal

(Department of Mental Health, 2002)

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

The study by Taylor et al. (2004) which studies on socio-economic differentials in mental disorders and suicide attempts in Australia, utilized the GHQ-12 for the assessment of mental health. Also, the study by Pernice et al. (2009) which study on the correlation on employment status, duration of residence and mental health among skilled migrants to New Zealand, also utilized the GHQ-12 to assess the mental health state too.

Self-Reporting Questionnaire (SRQ)

The Self Reporting Questionnaire (SRQ) has been developed by WHO as the tool designed to screen for psychiatric disturbance, especially in developing countries. The SRQ consists of 20 questions which have to be answered by yes or no. Various additional questions have been used with the SRQ-20, to screen for psychotic disorder and substance abuse. (Beusenberg and Orley, 1994)

For the SRQ all answers are apply as YES/NO answers, these following are the example of questionnaires: (1) Do you feel nervous, tense or worried?, (2) Do you cry more than usual? , (3) is your daily work suffering?, (4) Do you feel that you are a worthless person? (5) Has the thought of ending your life been on your mind? (6) Are you easily tired?. The scoring of each 20 items is scored 0 or 1. A score of 1 is indicated that the symptom was there during the past month, a scoring of 0 was indicated that the symptom was not there. Therefore, the maximum score is a total of 20.

For the SRQ there is no universal scale, it is depending on the cases that the researcher wants to apply on and the context of each country towards the usage of languages and the differentiate of culture. For example, the study of Ludermir and Lewis (2003) using cutoff at 5/6, which refer that if the person got the test of more than 6, than it implies that a person has a psychotic disorder.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Ludermir and Lewis (2003) had the study on the relationship between informal work and common mental disorders which utilizes the SRQ to access the mental state of samples and kept going utilized SRQ for further study in 2005 to investigate the question that "is there a gender difference on the association between informal work and common mental disorders?"

Mental components scores (MCS)

The Mental Components scores (MCS) are part of the component from the short form of health survey- 36 (SF-36) that is the questionnaire which constructed from Ware et al., 1992. By using this assessment from Thailand and other countries internationally. This questionnaire consists of 36 questions divided into 8 sub-health dimensions, 1) Physical Functioning: 10 items, 2) Role limitation due to physical problems: 4 items, 3) Bodily Pain: 2 items, 4) General health perception: 5 items, 5) Vitality: 4 items, 6) Social functioning: 2 items, 7) Role limitation due to emotional problems: 3 items, and 8) Mental health: 5 items. In addition, the questionnaire has 1 additional question regarding to the changing on health status of respondents. In score reporting, scores are reported for each of the 8 dimensions of health, with scores ranging from 0-100, which higher score means better. The MCS can describe mental health, role-emotional, social function and vitality scales. (Kangwanrattanakul, 2018)

There are 4 domains that were included in Mental Components Scores (MCS) as included: Vitality (VT), Social Functioning (SF), Role-emotional (RE) and Mental health (MH). These are the example of questionnaires and how they answer the questions for each domain: Firstly, Vitality (VT); (1) Do you feel lively and energetic? (2) Do you feel exhausted? The way they answer the question is, out of 6 the respondent needs to arrange by the lowest which is 1 means all the time and the highest is 6 which is never. Secondly, Social Functioning (SF); (1) In the past 1 month, either your physical health or mental health got distracted by your social activity? For example, meeting up with friends and family or your neighbor. The way they answer the question is out of 5 the respondent needs to arrange by the lowest is which is 1 mean never and the highest is 5 which is all the time. Thirdly, Role Emotional (RE); (1) Doing work or other activities achieve not as long as before, (2) Not careful on the work or other activities, these questions are answer as have or don't have. For the last domain is Mental Health (MH); (1) Have you ever felt worried? (2) Are you feeling calm? the way respondent answers these questions are as follow 1 for all the time and 6 never.

In the scoring part, the score will be sum together as the same domains altogether and in the end use the exist formula. The domains are between 0 to 100

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

meaning that the highest score represent the good mental health and the lowest represent the bad mental health. Which each domain are equals to 100, to measure the Mental Components Scores (MCS) all 4 domains must divide, and the result should together as 100.

For the threshold of MCS assessment, using the norm-based scoring which above 50 meaning a normal mental health is taking place but for below 50 the result is showing not normal mental health. MCS can determine each domain from each mental health of how it's interpreted; in the case of Vitality (VT) the result that gain high score the meaning is that the respondent is feeling full of excitement and energy between the past one month. On the other hand, if they got the lowest score it will reflect the mental health of tired and low in energy.

For the next one is Social Functioning (SF), for the high score will reflect the result that the respondent got normal throughout the social activity without any physical or emotional in the past one month, and for the lowest which mean that they got an issue with their physical and emotional that affect the activity that they are doing.

Meanwhile, Role Emotional (RE) lowest score mean that the respondent got a problem with their work or other daily activity and the highest mean that the result is they do not have any problem with the daily activity through the emotional for the last one month.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Lastly, General Mental Health (MH), for the lowest score mean that the respondent is feeling anxiety and depress all the time and for the highest the result can be shows that the respondent is feeling calm, chill, happy in the past one month.

There are many studies that utilized the MCS to access the mental health state on their study, for example, the study from Milner et al. (2014) on the topic of employment status and mental health among persons with and without a disability that evidence from an Australian cohort study. Likewise, the study by Edwards, Gray and Hunter (2015) which investigated on the impact of drought on mental health in rural area and regional Australia. The study that also utilized MCS are from Neubert et al. (2019) which studied on the correlation between unemployment and mental health in German population especially in the role of subjective social status.

2.1.4 Thai Mental Health Indicator (TMHI)

Thailand Mental Health Index (TMHI) is the questionnaire which the researcher utilizes for measuring mental health state in this study. Therefore, researcher investigates more in terms of how the questionnaire is formed and how-to evaluate mental health by index. The study by Mongkol et.al. (2009) are the study of reforming of TMHI that is widely used currently, especially in Department of Mental health Thailand. This is 2007 version and improves from the previous version in the proportion of gender and region sampling and there are 2 forms of this index: long-form consisting of 55 items and short-form with 15 items.

For the long form with 55 questions, each question can have a score between 0-3 where 0 means none perceived in that items and 3 means had mostly agree in that item. Thus, with 55 questions the total score can range between 0 and 220. The scores for the complete version were divided into 3 groups: better than average mental health (179-220), average mental health (158-178), and below average mental health (<157).

Similarly, for the short form there are 15 questions each with the ranging from 1 to 4 making a total score ranging from 0 to 60. The comparable short version scores were also divided into 3 groups: better than average mental health (51-60), average mental health (44-50) and below average mental health (<43).

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Table1 shows the detail of question of Thailand Mental Health Indicator-15 edition used in this study, to show the question and mental health domain of each question of this questionnaire.

Table 1 List of TMHI-15 questions

Question	Mental health domain
1. You feel satisfied with your life	Domain 1 Mental State
2. You are at ease	Domain 1 Mental State
3. You feel tired and dispirited with daily life	Domain 1 Mental State
4. You feel disappointed in yourself	Domain 1 Mental State
5. You feel that your life is suffering	Domain 1 Mental State
6. You can accept the problem that is difficult to solve, when there is a problem	Domain 2 Mental Capacity
7. You are confident that you be able to self-contained, when a critical or serious situation occurs	Domain 2 Mental Capacity
8. You are confident that you can encounter tragedy that occur in your life	Domain 2 Mental Capacity
9. You feel sympathy when others were suffering	Domain 3 Mental quality
10. You feel happy to help others who got trouble	Domain 3 Mental quality
11. You help others when you have the chance	Domain 3 Mental quality
12. You feel proud of yourself	Domain 3 Mental quality
13. You feel secure in your family	Domain 4 Supporting factors
14. If you have severe illness, you believe that your family will take good care of you	Domain 4 Supporting factors
15. Your Family members have love and bond together	Domain 4 Supporting factors

Yiengprugsawan et al. (2011) studied on happiness, mental health, and socio-demographic association among a national cohort of Thai adults by utilizing the TMHI for assessment of mental health state of the samples in their study. Likewise, the study on mental health and defense mechanism among flight attendants in the commercial airline in Thailand that be investigated by Puangsorn and Buathong (2017) utilized the long-form 55 items of TMHI for assessment of mental state of flight attendants in their study.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

2.2 Employment status

2.2.1 Definition of employment status

The Cambridge dictionary defined the definition of employment as “work that you are paid to do for a particular company or organization”, also terms of employment status that means “the position of being legally employed by a particular company” and there are additional definitions of employment status from 1993

International Classification by Status in Employment (ICSE) give the meaning is “the classification of job that held by person at a point in time with respect to the type of explicit or implicit employment contract that person has with other persons or organization”.

2.2.2 Classification of employment status

From the resolution concerning the International Classification of Status in Employment (ICSE) in 1993 (ICSE-93), there are classified with the type of explicit or implicit contract of employment of one to other persons or organizations and defined with reference to distinction between paid employment jobs and self-employment jobs, which consists of as follow:

Firstly, the definition of employees are those workers who hold the type of job defined as paid employment jobs.

Secondly, employers mean those workers who is working on their own account or with one or a few partners. To hold the type of job defined as a self-employment job and on continuous basis have engaged one or more persons to work for them in their business as employee(s).

Thirdly, own-account workers mean those workers who is working on their own account or with one or more partners, hold the type of job defined as a self-employment job but have not engaged on a continuous basis any employees to work for them during the reference period.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Fourthly, member of producers’ cooperatives means workers who hold a self-employment job in a cooperative producing goods and services, in which each member takes part on an equal footing with other members in determining the organization of production, sales and/or other work of the establishment, the investments and the distribution of the proceeds of the establishment amongst their members.

Next, contributing family workers mean workers who hold self-employment job in a market-oriented establishment operated by related person living in the same household, who cannot be regarded as partners, because their degree of commitment to the operation of the establishment, in terms of working time or other factors to be determined by national circumstances.

Lastly, workers not classifiable by status include those for whom insufficient relevant information is available, and or who cannot be included in any of the preceding categories.
(15th Conference of Labor Statisticians, 1993)

In context of Thailand, there are classifications of employment status with many criteria, from Thailand-A labor market profile document that published by the regional office for Asia and the Pacific of International Labour Organization in 2013 has classified employment through all 4 main criteria as follows by sector, status, occupation and by educational attainment with details of each criterion as follows:

Firstly, employment by sector and labor productivity reveals “the capability of each sector to absorb labor as well as the intensity of labor used as a factor of production” and also informative on where the economy is in the stages of development, which involves with employment in the agriculture and fishery sectors, employment in manufacturing sectors and employment in service sectors. All of these sectors are use in this research paper.

Secondly, employment by status used to define status of employment based on the type of contract that the person has with other persons or organizations, according to ICSE-93, which consists of employees, employers, own-account workers, members of producers’ cooperatives, contributing family members and workers who not classified by status.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Thirdly, employment by occupation classifies jobs into major groups. For the Thai data the occupation indicator is classified by the National Statistical Office (NSO) according to the International Standard Classification of Occupations, 2008 (ISCO-08), which contain of following major groups: legislators, senior officials and managers; professionals; technicians and associate professionals; clerks; service workers and shop and market sales workers; skilled agricultural and fishery workers; craft and related trades workers; plant and machine operators and assemblers; elementary occupations; and armed forces (although the NSO changed “armed forces” to “workers not classifiable by occupation”)

Lastly, Employment by educational attainment that Thailand’s national classification of educational attainment and the National Statistical Office use the

following categories: no education; lower secondary level; upper secondary level and higher level

(Thailand A labour market profile, 2013)

2.2.3 Employment status by economic sector

This research paper uses this economic sector to be criteria to classify the employment, due to the reason as follow:

The classification of employment by economic sector is the classification of employment status by type of labor used in their career function and production. The employment by sector helps to show the contribution of job creation of each sector to gross employment in each economy (Thailand A labour market profile, 2013). The classification for employment by sector divides employment into three broad groupings of economic activity included agriculture sector, industry sector and services sector, the sectoral information is particular meaningful for identify the broad changes in employment and levels of developing in each nation (International labour office, 2016)

There are a few studies which categorizing the employment status by economic sector for example, the study from Chuang, Hsieh and Lin (2010) about labour market activity of foreign spouses in Taiwan in terms of employment status and choice of employment sector, this study classifies the employment sector that consists of three categories: the natural resources sector, the industrial sector and the services sector and for employment status, they observed only if the respondent has a full-time job.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Lindsay (2011) had the study on employment status and work characteristics among adolescents with disabilities by the data about the employment gained from the 2006 Participation and Activity Limitation Survey (PALS) that conducted by Statistics Canada. Her variables on employment status are evaluated by dummy of working and not working and specified in terms of industry sector (economic sector) was measured using the standardized national occupational classification that included: Agriculture-forestry-fishing/hunting, Mining-oil and gas extraction, Utilities, Construction, Manufacturing industries, Wholesale trade industries, Retail

trade industries, Transportation and warehousing, Information and cultural industries, Real estate-rental and leasing, Professional, scientific and technical, Administrative support and waste mgt, Educational services industries, Health and social services, Arts-entertainment and recreation, Accommodation and food services, Other services industries and last sector is Public administration.

The study by Khan et al. (2014) on the understanding employment situation of women in a district level analysis which this study provide analysis of key labour market indicators of Faisalabad, India such as, employment status, sector, education and wages of women. For the female employment by sector, they utilized Faisalabad labour force survey pilot in 2008 data, consist of three sectors: industry sector, agricultural sector and services sector with the proportion of female in each sector being 21.4, 60.5 and 18.1, subsequently.

Bishop and Gripaios (2010) studied on the impact of externalities on employment growth in sub-regions of Great Britain employ the Ordinary Least Square (OLS) and maximum likelihood spatial models. To obtaining the data about employment for subregions of Great Britain from UK's National On-line Manpower Information System (NOMIS) with using the 1992 Standard Industrial Classification (SIC) for classification of employment status. Which the employment categories were including; Business services, Distribution, Industry and personal services. Which is divided close to the criteria that maintain in the research paper, but the different in Thailand versus UK agricultural sector is that the scale of Thailand agriculture sector is bigger than in the UK.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

2.3 Effect of employment status on Mental health

In this section, we will investigate how employment status impacts mental health by first discussing the mechanism or channel that this effect can occur. Then, we will shift to review existing empirical studies on the topic.

2.3.1 Mechanism/ Channel from employment to mental health

It is found that there are three main channels/ mechanism that employment status may affect mental state including income, self-esteem and social interaction.

2.3.1.1 Income

With the objective for working is to improve the skills of individual and get the return back in term of money. Which, the money can come in a form of financial reward such as salary or income, and profit. Since, money is one of the factors of living, to consume need and want in daily life. This can lead one to fulfill standard of living and consume what one needs and wants in his/ her life. By this, it can increase a better mental health issue.

Kronenberg, Jacobs and Zucchelli (2015) investigated the impact of a wage increase on mental health, that evidence from the UK minimum wage. They used the data from the British Household Panel Survey (BHPS) round 7th to 9th (29th of August 1997 to 30th of April 2000) with the UK National Minimum Wage (NMW) had launched between round 8th and 9th of the data. And for the measure of mental health in this study utilized the GHQ-12 version and used ordinary least square (OLS) with combining the difference-in-difference (DiD) model to compare the difference in outcomes (GHQ) to pre and post intervention of NMW. They found that no significant effect of the wage increases on mental health, but they found that employment can improve individual mental health by the reasons of lower healthcare utilization, benefit saving and income tax gains when people got the jobs and earned the salary.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Golberstein (2015) investigated the effect of income on mental health in older age, especially in the Social Security retirement income. He utilized the 6,571 observation from the Assets and Health Dynamic among the Oldest Old (AHEAD) cohort of the Health and Retirement study (HRS) to identify the casual effect of Social Security income on mental health among older people with the instrumental variable models. He found that increasing Social Security income significantly improve mental health state of older women because the increasing of income associated with the more independent living especially for widowed households and

the income benefits mental health by reducing the stress that correlated with financial hardship.

Gresenz, Sturm and Tang (2001) studied the relationships between mental disorders and individually socioeconomic state specifically in term of income both inequity in their area and individual income. With cross sectional study using nationally representative, 'Healthcare for Communities survey (HCC) study from USA sample. The dependent variable shows that individual mental health status (by 5 items Mental Health Inventory MHI-5; average 80.6) and indicator of probable anxiety or mood disorder based on clinical screening instruments. The study was found that MHI-5 decreasing (mean that worsen mental health) and the probability of anxiety or depressive increasing continuously from the highest to the lowest quintile of family income. Finally, there are the association between individual income and mental health and that is strong relationship.

Sareen et al. (2011) examined the association between income, mental disorders and suicide attempts, with longitudinal, nationally representative survey, study from USA general population. The dependent variables show the lifetime DSM-IV (mental disorders and lifetime suicide attempts). The result show that mental disorders were associated with lower levels of income. Participants with household income of less than $20000per year were at increased risk of incident mood disorders during the 3-year follow up period in comparison with those with income of $70000 or more per year. Moreover, decreasing in household income was also led to increasing in risk of incident mood, anxiety, or substance, use disorders in comparison with respondents with no change in income. However, there is no evidence that mental disorders could increase the risk of change in personal or household income.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

2.3.1.2 Self esteem

Self-esteem is a belief and confidence in your own ability and value (Cambridge dictionary). The challenging of the working task can be improving the skill of an individual, which can lead to an increasing of the capability for those workers. Therefore, gaining extra skills can motivate the individual, which helps to increase confidence and also this can increase the acceptance from others. By this, it

can build up even more self-esteem towards those individuals. Moreover, self-esteem is one of the dimensions that can lead a person into a better mental health.

Goldsmith, Veum and Darity (1997) studied about relationship between joblessness, unemployment and dropping out of labor force on self-esteem. They utilized the data from National Longitudinal Survey of Youth (NLSY) which dependent variable was self-esteem and independent variable were labor force experiences and nonlabor force experiences by conducted analysis using ordered probit model. They found that unemployment deteriorated self-esteem for female youths based on the impact of employment on ego development and the transition to their adulthood, moreover its indirectly effect on other aspects of personality, specifically may harm perceptions of self-worth.

Trunk, Heffner and Kramer (2011) investigated the impact on severe and persistent mental illness in term of community mental health study of self-esteem and symptomatology. They used a two-way analysis of variance (ANOVA) to examine the self-esteem in the working and non-working groups which took place at a Vermont community mental health center. They found that significantly interacted between work and self-esteem on reveal that people who have work showed the higher self-esteem than who has no work, since work can be source of financial reward and provide a chance to develop a new skill to develop part of their identity.

Mann et al. (2004) studied the important of self-esteem as protective factor in term of physical and mental health promotion. The aim for this is to clarify how self-esteem is related to physical and mental health. The paper was construct through qualitative research that reviewing the empirical studies and existed theory (systematic review research). With the reviewing of both empirically and theoretically, and to offer arguments for enhancing self -esteem and self-concept (i.e. the person's attitude to himself, in terms of physically, mentally and socially, as a result of self-awareness) as a major aspect of health promotion as follow. First methodology was to review of the empirical evidence on the consequences of high and low self-esteem in the domains of mental health, health and social outcomes. Second methodology was the discussion of the role of self-esteem in health promotion from a theoretical perspective. In conclusion, there are beneficial outcomes of positive self-esteem, in which is seem to be associated with mental well-being, happiness,

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

adjustment, success, academic achievements and satisfaction. And also associated with better recovery after severe disease. It is also, found from reviewed studies that low self-esteem can be a casual factor in depression, anxiety, eating disorder, poor social functioning, school dropout and risk behavior. For the final conclusion, self-esteem enhancement can serve as key component in Broad-Spectrum Approach (BSA) in prevention and health promotion.

Henriksen et al. (2017) studied on the role of global self-esteem in the development of symptoms of anxiety or depression, simultaneously, in a clinical sample of adolescents while accounting for gender, therapy and medication. Longitudinal study the employs data from a sample of 201 adolescents of people in Trondheim, Norway. The dependent variables were symptoms of anxiety/depression and attention problems (measured by self-report in clinical sample). The study discovered that high self-esteem predicted lower symptoms of both anxiety or depression 3 years later, after controlling prior symptom levels, gender, therapy (or not) and medication. To sum this up, the relevance of global self-esteem, not only with regard to emotional problems but also to attention problems

2.3.1.4 Social Interaction

Us as a human is one of the social creatures, working place is also one of the social lives that most of the working people will face when entering into the working environment. Since then social interaction will be part of the function that they cannot escape. Social interaction can be both advantage and disadvantage, the advantage part comes in a form of each individual being part of the social or get the support from others when the person needs help. But for the disadvantage especially in term of introvert type might be a bit difficult for them to interact with others. This may lead to increasing the nervousness by this it can cause their mental health to deteriorate.

Bolton and Oatley (1987) looked at the association of social support and depression in unemployed men. They investigated by interview with 49 men who just became unemployed and follow-up interviews took place 6-8 months after that. The multiple regression analysis is utilized to find the relationship between employment and social support. They found that depression scores were significantly higher in

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

those who still unemployed and who had few social communicate with other. Because when people lose the source of social interaction. They lack the support for coping with each specific stressor (i.e. the factor that triggers stress) and unemployment is one of specific stressor.

Honey (2004) looked at the benefits and drawbacks of employment especially in perspective of people with mental illness. The study is constructed with qualitative research on 41 participants in 76 in-depth interviews and two focus groups. She found that the benefits and drawbacks of employment are experienced in 6 domains: (1) money (2) purposeful and meaningful activity (3) growth and development (4) social participation and belonging (5) self-esteem (6) mental health. Specifically, in term of social participation and belonging, the feeling to be part of a society is the basic need of humans and work is the one way to becoming accepted, moreover, social support also helped participant cope better with unfavorable situation such as boredom, isolation and low self-esteem.

Ono et al. (2011) studied on the relationship between mental health and social interaction that look at the amount of face-to-face contact time and quantified mental health. The duration of the data was measured from March 1 till 31, 2011. The independent variable of social interaction term that were obtained from the observation on 2 organizations in Japan. On the other hand, the dependent variables were the mental health (assessed by the psychological questionnaire) and were constructed from the Mental Health Pattern (MHP) scale. The results show that, there was a statistically significant correlation between amount of social interaction and individual mental health. The significant negative association between amount of social interaction and degree of stress while there was slightly positive correlation between social interaction and degree of life satisfaction. These results indicated that social interaction (in term of support) could possibly exchange through face-to-face and could reduce the stress generated in social life. The implication from this study was people who interact with others tend to have relatively less stress.

Bertera (2005) investigated on the association between positive social support, social negativity and anxiety and mood disorders. This cross-sectional study utilizes secondary data from National Comorbidity Survey (NCS), which is a nationally representative survey of U.S. households. The explanatory variables include social

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

support and social negativity data, which were obtained from the questionnaire and there were 6 questions on each aspect. The study of dependent variables were anxiety disorders and mood disorders which were obtained from the modified version of the Composite International Diagnostic Interview (CIDI). From the study found out that the perceived social negativity was consistency associated with a high number of anxiety and mood disorder. Based on the positive social support from the relatives was associated with a lower number of anxiety and mood disorder episode.

2.3.2 Empirical studies

2.3.2.1 Studies on other countries (except Thailand)

International research has long studied the relationship between mental health variables and work status. It is studied in the context of individual country, with the independent variables used to describe them are unemployment, employment status related variables. The difference is methodology in research, difference of countries context and measurement of mental health.

A. Employment status and mental health

In early work, utilizing basic analytical techniques as regression, as the work of Flatau, Galea and Petridis (2000), which studied unemployment and mental health and wellbeing. They chose a nationally sample and cross-sectional data from 1995 National Health Survey (NHS) and 1997 National survey of mental health and wellbeing of adults (SMHWB) in Australia, which covered 53,828 participants and 10,641 participants aged 18 years and over, consequently. They conducted analysis using multiple regression. And they found that, in the 1995 NHS data set, the unemployed indicated lower mean mental health scores than full-time and part-time employed, especially in term of person who unemployed compared with part-time employed, the quantitative effect for women is greater than men. They got the conclusion that unemployed persons showed the poorer mental health and wellbeing outcomes than the full-time employed.

Pernice et al. (2009) investgated the relationship on employment, duration of residence and mental health. They conducted from a longitudinal survey of 107 skilled immigrants to New Zealand from the China, India and South Africa with face-

to-face interviews processing and employed descriptive statistics for the analysis. Their findings were that participants had poor mental health state in the first and second years during their finding jobs duration. Then mental health slightly better along with increasing rates of employment.

Rosenthal et al. (2012) studied on the importance of full-time work for mental and physical health of urban adults in New Haven, USA. They recruited 1205 who were racially diverse adults on age 18 to 65 years old and utilized ANOVA and post-hoc analyses to compare those employed full-time, part-time and unemployed in self-reported mental health and health behaviors. They found that those employed full-time showed the lowest damaging psychological factors and health behaviors with the least levels of stress and depression and for those employed part-time and unemployed reported in the middle and unhealthy end of all psychological and behavioral factors, consequently.

In term of mental health on people who were with disability, Milner et al. (2014) had studied on the differences in mental health in dimension of workforce status among those with and without disabilities. They utilized longitudinal nationally data of the Household Income and Labor Dynamics in Australia (HILDA) with 2,379 participants those disabilities and 11,417 of those without disabilities and accessed on Mental Health by using MCS from the Short Form 36 (SF-36). They analyzed by fixed-effects regression models. The findings were that those unemployed and economic inactive had correlated negatively on the MCS among those disability. Moreover, on those who were not disability, there are smaller decreasing on MCS on those unemployed and economics inactive.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Especially, in term of climate factor that effect on mental health in differential employment sector are studied by Edwards, Gray and Hunter (2015) in the impact of drought on mental health in rural and regional Australia. They constructed from the cross-sectional data of 2007 Rural and Regional Families Survey (RRFS) of Australia with 8,000 participants. The analysis utilized logistic regression and OLS model to see the effect of drought on mental health problems and on mental health scores, respectively. The findings that they gained, were drought has negative impact on mental health, on those who were faced that most were farmers and farm workers (people who were in agriculture sector). Other than this, those who were both living

in droughted areas or not, farmers also have lower wellbeing scores than those who work in non-agricultural sectors

Meyer et al. (2016) investigated the relationship between workplace and security stressors and adverse mental health outcomes through those migrant workers from Myanmar in and around Mae Sot, Thailand. They recruited total sample of 589 migrant workers, working in agricultural, factory and sex industries and the assessment for mental health using adapted version of the Hopkins Symptoms Checklist-25 (HSCL-25) which is continuous variables. The multivariate regression models were utilized for the analysis. The result finds that those male in agricultural sector, had security stressors associated with increasing in depression symptoms. And for those females in agricultural sector, faced the same association between security stressors and depression.

M. Perreault et al. (2016) had studied on the relationship between employment status and mental health, specifically in the role of social support and coping strategies as mediator. They developed the survey based on procedures of the National Population Health survey, with total sample were 2,323 participants who were aged 18 to 64 years old in south-west Montreal, Canada. They analyzed by using structural equation modeling. They found that employment status significantly affects depression among those under 45 years old, that means having full-time employment reduces depression and distress comparing to those who are unemployed.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

As the aspects of unemployment, Neubert et al. (2019) had studied on the relationship between unemployment, subjective social status (SSS) and mental health of the German. They constructed the cross-sectional study by using nationally German Socio-economic Panel Innovation Sample (SOEP-IS) data with 1,230 participants who were in 15 to 65 years old and for assessment of mental health using the MCS of SF-12. They utilized the path model with maximum likelihood estimation for the analysis. The findings were that the negative effect of employment status across mental health, was explained through the reduction of national SSS. And the unemployment could worsen mental health.

B. Employment status and mental disorders

In term of association of mental disorders such depression and employment status, Dooley, Prause and Ham-Rowbottom (2000) studied on the becoming either unemployed or inadequately employed whether it is associated with depression in United States. They employed the longitudinal National Longitudinal Survey of Youth (NLSY) for the years 1992-1994 which covered 5,113 participants who were adequately employed in 1992 and conducted analysis by using multiple regression. The findings were that the unemployed and inadequately employed groups both reported significantly more depression than those with employment, but the two groups were not different from each other in depression change.

Bernarda, Ludemir and Lewis (2003) did study about the relationship between informal work, that are one kind of employment status, and common mental disorders (CMDs) in Northeast of Brazil. The self-reporting 20-queationnaire (SRQ-20) was employed to estimate the prevalence of common mental disorders (CMDs) in this study and cross-sectional survey with 683 people who aged 15 years old and above, living in northeast Brazil were constructed. They utilized logistic regression for the analysis and gained the results that were informal workforces had higher prevalence of CMD than those with formal employed. And further study from them, was taken place in (2005) that extent the study with the terms of gender was impact on association between informal work and CMDs. they also utilized the same observation and logistics regression to analyze especially the effect of gender term. The findings were female formal workers revealed the significantly better mental health when compared to other work status and the prevalence of CMD is higher in female, elderly, migrants, separated and widowed, less educated and those living in low-income household.

Honkonen et al. (2007) investigated the relationships between employment status and specific Diagnostic and Statistical Manual for Mental Disorders, IVth edition (DSM-IV) and the relationships between employment status and service use for these disorders. They constructed sample with 3440 employed, 429 unemployed and 820 economically inactive of aged 30-64 years old in process of health examination. They analyzed by using the binary logistic regression. They found that the risk of mental disorders was higher among those unemployed and those

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

economically inactive than those employed and the CMD are less prevalent among the employed than those unemployed and those economically inactive.

Ford et al. (2010) tried to examine rate of CMD in individual who were employed, unemployed and gained UK benefits with investigated relationship between duration of unemployment, gender and CMD. They used cross-sectional data from 5090 working-age samples from the Adult Psychiatric Morbidity Survey 2007 and gained the assessment of CMD from the Clinical Interview Schedule. They utilized logistic regression for the analysis. The findings revealed that risk of CMD is significantly higher in person who unemployed, economically inactive, not working with physical health reasons, unable to find fit job, receiving housing, care or sickness benefit and receiving income support.

In term of mental disorders in specific group community, Gouttebarge et al. (2016) investigated the association of level of education, employment status and working hours with symptoms of common mental disorders on the current and retired professional footballers. They constructed cross-sectional analyses with total of 607 current professional footballers and 219 retired professional footballers. The assessments of mental disorders were employed GHQ-12 and 4-dimensional symptom questionnaire (4DSQ) and employed univariate logistic regression for the analysis. The findings were those retired professional footballer showed statistically significant negative correlations between employment status and symptoms of distress, anxiety depression. On those current professional footballers, level of educational wasn't related with symptoms of CMDs

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Torre et al. (2018) studied on the prevalence of major depressive disorder in the adult population of Spain and the relationship with personally and socio-economic factors. The nationally cross-sectional data were from European Health Interview Survey (EHIs) in Spain 2014. They utilized the Patients Health Questionnaire (PHQ-8) for assessment of major depressive disorder state (MDD) and analyzed with multiple logistic regression. They found that MDD more prevalent for those unemployed, retired, pre-retired or unable to work with incapacity reason comparing to those who are employed.

C. Suicidal and employment status

In term of suicide dimensions, there are 3 researches that author had reviewed, Corcoran and Arensman (2009) looked at the employment status and risk of suicide in Ireland during the duration of economic boom that as well known as the Celtic Tiger (1996 to 2006). They constructed the research with nationally data from Irish Central Statistics Office (CSO) and also gained the data number of deaths by suicide and the deaths of undetermined intent from CSO. They utilized the Poisson regression for the analysis process. The findings were revealed that unemployment was related with increasing risk of suicide and undetermined death, when unemployment rate was low in 2001 to 2006.

The other research was studied by McMilan et al. (2010) on the study of the association between income and distress, mental disorders and suicidal ideation and attempts. The study was constructed from the nationally data of Collaborative Psychiatric Epidemiology Surveys (CPES) with sample of 18 years and older from USA. The assessment of distress term was from the Kessler Psychological Distress Scale(K10), mental disorders were from DSM-IV and the suicidal ideation and suicide attempt gained from the question about suicidal thought. They utilized linear regression for the distress term and utilized multiple logistic regression for the mental disorders and suicidal terms. They found that there is the inverse relationship between income and psychological distress. The association between income and mood disorders was inconsistent.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

And the research by Yur'yev et al. (2010) had investigated the association between suicide mortality and employment status in Europe. They constructed study with nationally data from suicide trend of WHO in 1998 to 2008, European Mortality database and from Total Economy Database in 1980 to 2008. The analysis utilized Pearson correlation test to assess the association between suicide and employment trends. The finding was revealed that employment and suicide trends are negatively correlated in the most countries. For the suicide mortality, there was related with unemployment risk and expectations of inadequate financial stuffs on during the unemployment duration.

2.3.2.2 Study on Thailand

For researches in Thailand context, that related with mental health, and socio-demographic by Yiengprugsawan et al. (2011). In this research have studied in the socio demographic factors that affect Happiness of Thai people by using the data from The Thai Health-Risk Transition Study. Which includes an ongoing Thai Cohort Study (TCS) of 87,134 adult Open University students nationwide by the cohort, it is made up of distance- learning students who were enrolled at Sukhothai Thammathirat Open University (STOU) in 2005 who are 20 to over 45 years old. This study focused in term of Happiness by evaluating mental health from Thailand Mental Health Index (TMHI) questionnaire (form of 2003) and specifically study in which domains of this index are relevant with happiness term. They found that age and gender have minor effect on happiness, but marital status (divorced, separated or widowed), low household income and no paid work all have strong adverse effects on happiness. And in term of TMHI, it is found that mental state and social support domain are strongly correlated with happiness, but the other two domains (i.e. mental capacity and mental quality) are not correlated with happiness.

Chaiprasit and Santidhirakul (2011) investigated the happiness at work of employee in Small and Medium sized Enterprises (SMEs) in Thailand. Their sample comprised 300 employees that consist of 100 persons from three business sector in Chiang Mai, Thailand: manufacturing sector, service sector and commercial sector. They answer questionnaire that consists of 2 parts: (1) personal information and demographic and (2) 43 questions on opinion towards five factors of happiness in the workplace. The result that they got were, the level of happiness and opinion towards five factors of happiness in the workplace were at the high level. And from the five factors of happiness in the workplace, they found that there are three factors that led to happiness at work and able to predict happiness at work including: relationship, quality of work life and leadership.

Charoenpaitoon et al. (2012) did research on the factors that associated with depression among Thai female workers in the electronic industry. They conducted the cross-sectional survey of 444 females who working in the electronics industry in Ayutthaya province and utilized the multiple logistic regression for the research. They

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

found that those who had poor family's relationship, low rewards and poor social support had higher risk of suffering from depression and the prevalence of depression in women workers was 28.8%. The caring on depression issue in female workers should be conducted in the industry.

Puangsorn and Buathong (2017) did the research on mental health and defense mechanism among flight attendants in a commercial airline in Thailand. They used cross-sectional data of 260 flight attendants of commercial airline in Thailand, during August to December 2016 with the assessment of mental health by TMHI-55 and utilized multiple logistic regression for analysis. Their findings were 52.3% of flight attendants had an average mental health and 22.15% who are under the average value. Factors that lead to under average mental health were performance satisfaction, employing affect regulating defense and problems with college or supervisor.

Kaewanuchit (2017) studied occupational stress on Thai immigrant employees in Bangkok by using Thai Job Content Questionnaire (Thai-JCQ). Her sample comprised 500 Thai immigrant employees who were more than 20 years old and had worked in Bangkok with employed the path diagram for the analysis in each variable: working conditions, workload, job security and wages on occupational stress. The finding from her study were that working conditions had the most directly effect on occupational stress, followed by workload and job security, consequently. Whereas wage did not have any significant impact.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Table 2 shows the details for each literature in this section which are provided briefly detail of the literature review on the association of mental health and employment in both international and national literatures

Table 2 *Characteristics of each literature in this section*

No	Title and authors	Data	Dependent variable	Estimation Model
International literatures				
1	Mental health and wellbeing and unemployment (Flatau, Galea and Petridis., 2000)	1995 National Health survey and 1997 National survey of mental health and wellbeing of adults	Two indicators of mental health and wellbeing 1. psychological wellbeing measure derived from responses to question include in the 1995 NHS (sf-36 mental health scale-),1997 use ICD-10 classified mental health be 2. diagnose of mental disorders including substance use disorders, affective disorders and anxiety disorder,	-Tobit model for association between mental health among 1995 NHS sample - OLS model for association between number mental disorders and 1997 sample
2	Underemployment and Depression: Longitudinal Relationships (Dooley, Prause and Ham-Rowbottom., 2000)	The National Longitudinal Survey of Youth (NLSY) for the years 1992-1994	Depression data from the original Center for Epidemiologic Studies Depression scale (CES-D); scale consists of 20 items asking about the respondent's mood over the past week on a four-point (0-3) scale	Multiple regression model for the analysis of relationship between employment status and depression
3	Informal work and common mental disorders (Ludermir, Lewis., 2003)	Random Sample of Private households included 683 adults aged 15 years and over living in area II of Northeast Brazil	The prevalence of common mental disorders (CMD) by utilizing the self-reporting 20-questionnaire (SRQ-20)	Logistic model with odds ratios and 95% confidence were utilized for estimating the magnitude of the relationship between employment status and CMD
4	Socio-economic differentials in mental	1997 Australian National Survey of	Mental Disorders and suicide attempts from the 12-item General Health Questionnaire and the 12-item Short	Logistic regression for estimating the

	disorders and suicide attempts in Australia (Taylor et al., 2004)	Mental Health and Wellbeing from the Australia Bureau of Statistics	Form Health Survey	association between mental health and socio-economic status (SES)
5	Is there a gender difference on the association between informal work and common mental disorders? (Ludermir, Lewis., 2005)	Random Sample of 226 Private households included 683 adults aged 15 years and over living in area II of (Northeast Brazil)	The prevalence of common mental disorders (CMD) were assessed by self-reporting 20-questionnaire (SRQ-20) -	Logistic regression with odds ratio test to investigate differences among men and women on the relationship between employment status and CMD
6	Employment status, mental disorders and services use in the working age population (Honkonen et al., 2007)	Data collecting August 2000 to March 2001 in Finland - 3440 people aged 30 years or over employed, 429 unemployed and 820 economically inactive	Mental Disorder followed DSM-IV - depressive - anxiety - alcohol use disorders by using the standardized Mental health interview, the Composite International Diagnostic Interview (CIDI)	Binary logistic model for association between mental disorders among different employment status
7	Employment status, duration of residence and mental health among skilled migrants to New Zealand: results of a longitudinal study (Pernice et al., 2009)	New Seattle's' Questionnaire Schedule (NSQS) over 1998 to 2002 on skilled immigrants in New Zealand Divided 3 group of country applicants - 36 from China	using GHQ-12	T-test for mean differences in GHQ-12 score between full-time employed and unemployed

		- 36 from India - 35 from South Africa		
8	Suicide and employment status during Ireland's Celtic Tiger economy (Corcoran and Arensman., 2009)	- The Irish Central Statistics Office (CSO) - database of the International Labour Office Bureau of Statistics (LABORSTA)	Number of suicidal deaths and suicide from Irish Central Statistics Office (CSO)	Poisson regression model for the relationship between unemployment and suicide
9	The Association Between Income and Distress, Mental Disorders, and Suicidal Ideation and Attempts: Findings from the Collaborative Psychiatric Epidemiology Surveys (McMilan et al., 2010)	Collaborative Psychiatric Epidemiology Surveys (CPES) of those who are 18 years and older from US in 2001-2003	Three dependent variables including - Distress: the Kessler Psychological Distress Scale(K10) - Mental disorders: DSM-IV - Suicidal Ideation and Attempts (question)	- Linear regression (distress) - Multiple logistic regression (Mental disorders & Suicide terms)
10	Employment status influences suicide mortality in Europe (Yur'yev et al., 2010)	- Suicide trend from WHO (1998-2008) - European Mortality database (January 2010) - Employment data in 1980-2008 from Total	Two dependent variables were - Suicide trend from WHO - European mortality database	Pearson correlation analysis for relationship between employment trends in each Europe countries and suicide trends

		Economy Database		
11	Common mental disorders, unemployment and welfare benefits in England (Ford et al., 2010)	Adult Psychiatric Morbidity Survey (APMS) in 2007 with 5090 working-age participants in England	Dependent variableCommon mental disorders (CMD) using the Clinical Interview Schedule to identifies CMD	Logistic regression model for relationship between unemployment and CMD
12	The importance of full-time work for urban adults' mental and physical health (Rosenthal et al., 2012)	Randomized household health survey was conducted in six low-income neighborhoods in New Haven, Connecticut from October to November 2009	- Stress by question "Have you been feeling tense, stressed, or under a lot of pressure during the past month?" - Depressive symptom by question" feeling down, depressed, or hopeless?" and "little interest or pleasure in doing things?" resulting scale range from 0 -2 (no/yes to each question)	Post-hoc analyses for comparing of those employed full time, part time and unemployed in dimension of mental health (Stress and Depressive)
13	Employment status and mental health among persons with and without a disability: evidence from an Australian cohort study (Milner et al., 2014)	The household Income and Labour Dynamics in Australia (HILDA) survey	Mental health was dependent variable By using the Mental Component Summary (MCS) from the SF-36	Longitudinal linear fixed-effects regression models for relationship between mental health and employment status among those with and without disabilities
14	The Impact of Drought on Mental Health in Rural and Regional Australia (Edwards et al., 2015)	Data from the 2007 Rural and Regional Families Survey (RRFS) in Australia	Mental health was dependent variable which from the 5-item Mental Health Inventory from the Medical Outcomes Study 36-item Short form Health survey (SF-36)	- Logistic regression on the effect of drought on mental health problems - OLS model on the effect of drought on mental health scores

15	Are Level of Education and Employment Related to Symptoms of CMD in Current and Retired Professional Footballers? (Gouttebarge et al., 2016)	Assembling total of 607 current professional footballers and 219 retired professional footballers	Symptoms of CMD were dependent variables including - distress (4-dimensional symptom questionnaire) - anxiety/depression (12-item general health questionnaire (GHQ-12)) - sleeping disturbance (based on PROMIS (short form)) - adverse alcohol behavior (3-item AUDIT-C) - smoking - adverse nutritional behavior	Univariate logistic model for association between level of education, employment status and working hours
16	Workplace and security stressors & mental health among migrant workers on Thailand-Myanmar border (Meyer et al., 2016)	Respondent driven sampling (RDS) with qualitative research in total sample of 589 male and female migrants	Dependent variable was mental health degree (i.e. continuous variable) which assessing by adapted version of the Hopkins Symptoms Chechlist-25 (HSCL-25), resulting in 17 items in the depression scale (on a 1-4 Likert scale) and 11 in the anxiety scale (on a 1-5 Likert scale)	Multivariate linear models for estimating the association between stressors and negative mental health results
17	Employment Status and Mental Health: Mediating Roles of Social Support and Coping Strategies (Perreault et al., 2016)	Constructing survey based on procedures and criteria of the National Population Health survey, with 2,325 persons who were aged between 18- and 64-years Montreal, Canada	Dependent variable was mental health which was assessed with 2 variables: - Psychological distress; the K-10 scale to estimate the frequency of psychological distress using 10 questions (min 0, max 34) - Major depression; Composite International Diagnostic Interview (CIDI), resulting scale range from 0 to 1 (no/yes)	- Chi-square and ANOVA test - structural equation modeling (testing the mediators of the impacts of employment status on distress and depression)
18	Prevalence of major depressive disorder and association with personal and socio-economic factors.	European Health Interview Survey (EHIS) in Spain 2014-2015	Dependent variable was Major Depressive Disorder (MDD) which assessed through Patients Health Questionnaire (PHQ-8)	Single and Multiple logistic model for the relationship between personally socio-economic factors and

	Results for Spain of the European Health Interview Survey 2014-2015 (Torre et al., 2018)			prevalence of depression
19	Unemployment and Mental health in the German population: the role of subjective social status (Neubert et al., 2019)	German Socio-Economic Panel Innovation Sample (SOEP-IS), 1230 people who are in 15-65 years	Mental health was dependent variable which assessed the mental health component summary scale (MCS) of SF-12 health survey	Path model with maximum likelihood estimation for the relationship between subjective social status and mental health
			Thai literatures	
20	Happiness, Mental health, and Socio-demographic association among a National cohort of Thai Adults (Yiengprugsawan et al., 2011)	Thai Cohort Study (TCS) adult Open University students among 60,569 people in 2009	Dependent variable was happiness by utilizing short form of Thai Mental Health Indicators (TMHI) and compound with additional questions about the degree of happiness and level of satisfaction in their life	Descriptive statistics (t-test and Chi-square)
21	Happiness at Work of Employee in Small and Medium-sized Enterprise (SMEs), Thailand (Chaiprasit and Santidhirakul., 2011)	Data collecting from structured questionnaires with 300 employees; 100 from manufacturing sector, 100 from service sector and 100 from commercial sector	Happiness at work level 5-point likert scale with 3 dimensions of happiness at work; 1. Feel joy at work 2. Satisfied with work 3. Enthusiastic at work	Regression analysis for association between factors affecting happiness at work and happiness at work level

22	Factors Associated with Depression among Thai Female Workers in the Electronics Industry (Charoenpaitoon et al., 2012)	Data collecting from 444 females working in the electronics industry-located in Ayutthaya, Thailand, in March 2010	Dependent variable was depression. - Depression assessment was utilized of the Thai version Center Epidemiologic Studies Depression scale (CSE-D), contained 20 items which each item had 4 response categories on how often during past week	Multiple logistic model for investigating the association between factor associated and depression among female workers
23	Mental health and defense mechanism among flight attendants in a commercial airline in Thailand (Puangsorn and Buathong, 2017)	Data collecting from 260 flight attendants of commercial airline in Thailand	Mental health was dependent variable which utilizing Thai Mental Health Indicator Version 2007 (TMHI-55)	Multiple logistic model for relationship between factors and mental health
24	A Cross-Sectional Study on Occupational Stress of Using Thai-JCQ among Thai Immigrant Employees in Bangkok: A Path Diagram(Kaewanuchit., 2017)	Data collecting from 500 Thai immigrant employees were more than 20 years old who had worked in Bangkok	Dependent variable was occupational stress by using Thai Job Content Questionnaire (Thai-JCQ) - 54 question, result; slightly stressed, moderately stressed and highly stressed	Descriptive statistical analysis and Path analysis of variance for determining the variables that related with occupational stress

2.4 Other factors on mental health

2.4.1 Age

The study from Bernarda, Ludemir and Lewis (2005) on the effect of gender on the association between informal work and common mental disorders by using logistic regression model for analysis. The finding revealed the prevalence of CMD was higher in elderly. Corresponding with study from Torre et al. (2018) that studied on the prevalence of major depressive disorder in the adult population of Spain and the relationship with personally socio-economic factors. They also found that prevalence of major depressive disorder was more prevalent for those older age.

2.4.2 Gender

Honkonen et al. (2007) had studied the relationships between employment status and DSM-IV and the relationships between employment status and service use for these disorders by utilizing binary logistic regression for analysis. And they also found that depressive and anxiety disorders were more common on those women than men, but there was no difference in the various age on prevalence of depressive and anxiety. Corresponding with the finding from Bernarda, Ludemir and Lewis (2005) research on the effect of gender on the association between informal work and common mental disorders, it showed the prevalence of CMD was higher in female. And also, Torre et al. (2018) found the prevalence of major depressive disorder in Spain was higher among women.

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

2.4.3 Marital status

Yiengprugsawan et al. (2011) investigated on the socio-demographic factors that affect Happiness of Thai people. They found that marital status of being divorced, separated or widowed had strong adversely effects on happiness. For Bernarda, Ludemir and Lewis (2005) who studied the impact of gender on the association between informal work and common mental disorders by utilizing cross-sectional study and logistic regression, they found that in term of marital status those separated and those widowed had higher prevalence of CMD. Moreover, Honkonen et al.

(2007) revealed that mental disorders were more prevalence among those unmarried than among those who are married.

2.4.4 Education level

Taylor et al. (2004) had studied on the association between differences socio-economic factors and mental disorders and suicide attempts in Australia. They use cross-sectional data from 1997 Australian National Survey of Mental Health and Wellbeing with 10,641 participants. They utilized the GHQ-12 for assessment of mental disorders state and analyzed it with logistic regression to find the results. They found that there was positive significant between low levels of education and mental disorder and anxiety in both genders. And the study by Torre et al. (2018) that studied on the prevalence of major depressive disorder in the adult population of Spain and the relationship with personally socio-economic factors, they found that those with lower educational level are more likely to experience with Major Depressive Disorder (MDD).

2.4.5 Income

Yiengprugsawan et al. (2011) investigated the socio demographic factors that affect Happiness of Thai people by utilizing data from the Thai Health-Risk Transition Study which includes an ongoing Thai Cohort Study (TCS) of 87,134 participants and their finding revealed that low household income had strong adverse effect on happiness. Corresponding with the result from study of McMilan et al. (2010) showed that there was inverse correlation between income and distress. And another research supports the previous results that from Yur'yev et al. (2010) which studies on the relationship between suicide mortality and employment status in Europe, found that the inadequacy of financial resources during unemployment is related with high suicide mortality rate.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

2.4.6 Urban/Rural residence

Taylor et al. (2004) studied the relationship between differentials socio-economic variables and mental disorders and suicide attempts in Australia. The finding in term of urban/rural residence from their study, revealed that there is no significant effect of location on mental disorders trends. But the study from Flatau, Galea and Petridis (2000) found something in term of residence area. They found that people who lived in remote area have a smaller number of mental disorders.

2.5 Gap in the Literature and contributions of this study

2.5.1 Gap in the literature

1) Currently, there is no study in Thailand that investigates the association between mental health and employment status by using employment category by sector like what this research attempt to do.
2) There was no study in Thailand that explicitly explores different mechanism/channel, in which employment affects mental health state, like what we aim to do in this study.
3) According to studies in Thailand context that researcher had reviewed, there were no study that utilizes the data surveys from the National Statistics Officer (NSO), which are the national representative observation of Thai people.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

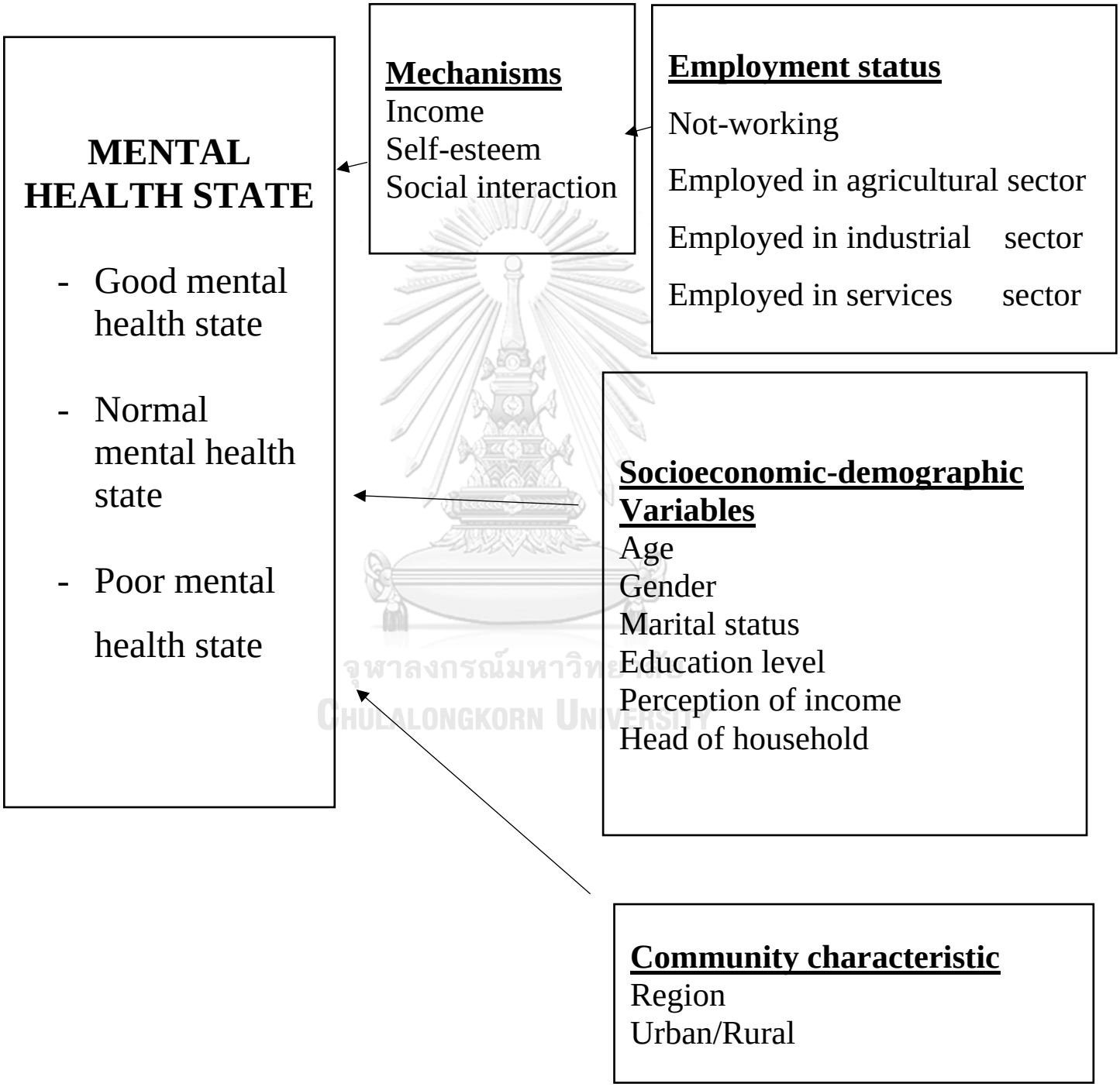
2.5.2 Contribution of this study

This is a nationally representative sample study. In this study, dependent variables of mental health state are measured by Thailand Mental Health Indicator (TMHI) and construct the study with the survey in condition of society, culture and mental health (Thai happiness) 2014 from National Statistics Office (NSO).
Especially, this study investigates more in term of mechanism/channel that transmit the employment status to individually mental health state and to gain the reason for why employment may affect people mental health.

CHAPTER 3

CONCEPTUAL FRAMEWORK

Figure 5 Conceptual framework



จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Figure 5 shows the conceptual framework of this study. The variables are expected to have certain effect on mental health.

The dependent variable of this study is mental health state, which is an ordered categorical variable. The highest category represents a good mental health state whereas, the lowest category capture spoor mental health states.

For the employment status categories, these are expected to be related to people's mental health because employment status affects income security, which is the money that is used to buy goods for consumption and basic necessities for living in daily life, resulting in mental stability then, is reflected through the individual's mental health.

For those who are in the not-working category in this study, they were the age above 15 years old, which during the survey time, they are not on the working status. Not working category was included housewives, students, elderly who retired or can't work, disabled who are unable to work, unemployed, seasonally unemployed and those who are working for certain reasons. *The 2014 labor force survey* at 4th quarter shows that the largest proportion for not-working groups is housewife (i.e. around 4.9 million people), followed by students (i.e. around 4.5million people). For the smallest proportion is unemployed (i.e. around 200,000 people) and followed by seasonally unemployed (i.e. around 98,000 people) (NSO, 2015). This shows that the not-working category of this study is referred as a heterogeneous group, therefore those differences might have an impact on the characteristics, needs and conditions. So, it might be difficult to interpret specifically either one of the not-working groups, which could affect the mental health state. On the other hand, researchers interpret and point out that common people who are not-working might face insufficient income or the feeling of not working which can lead to mental health state. For not-working people, this study is expected to have a negative relationship with the mental health level.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

For the employment status in which people are in the agricultural sector, this may decrease the probability of mental health state, because the reasons of income instability that causes individuals are concerned about income fluctuations, when the anxiety levels increase, it will lead to worse levels of mental health.

As employment status in which people are in the industrial sector, this may lead to a better mental health state, because most jobs in the industrial sector gain a stable salary which causes people to reduce their concerns about income fluctuations, when there is the declining concern, it will lead to improved mental health levels. Likewise, the employment status in those are in the service sector, there could be positively associated with mental health. With a condition of duty in the service sector mostly related to other people, so there might affect in term of having more chance to communicate with people, which improving social skill and it is good for social creature like human.

In terms of mechanisms that the employment may affect mental health, this study includes income, self-esteem and social interaction. About the self-esteem, employment could be impact on self-esteem of people who are working through earning and they felt that they could provide themselves, their family or their parents. The level of self-esteem could impact on mental health state, in term of increasing. Likewise, the social interaction, since humans are social creatures, employment could lead to be a part of society. Higher social interaction may improve mental health state of people who are working. And in terms of income, the expectation also corresponds as mentioned previously.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Regarding the association between age and mental health, this could be negatively in elderly on mental health. Because of those elder might have less social interaction from retirement condition. In terms of mental and gender, those females are expected to have lower levels of mental health than males. Since the social status in which females are under pressure from society's expectations and some concept in terms of inequity for women right in some society, makes pressure that seem more than males, are causing lower mental health level.

Whereas marital status and mental health, people who faced divorce and widows tend to have lower mental health levels than those in other marital status. Due to the sadness of the loss or the end of the marriage that may affect the attitude that they do not succeed in the life of their partner, which is seen as part of the goal of living then leading to decreased self-esteem and resulting in worse mental health levels.

In term of educational level, low education tends to have low mental health degree, since high education should result in easier finding a job and gaining more opportunity. The perception of income could positively affect the mental health. If people feel that their income are insufficient, it could decrease their mental health state.

For being a head of household, it might decrease the level of mental health degree since they come along with more responsibility that in term of such financially or duty and more expectation from society.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Lastly, for the region of residence, it possibly depends on the factors of subsistence in the region, including the environment of the region as well. In the same way, in case of urban or rural living areas, where prosperity or many facilities vary, so may affect comfort and lead to good mental health. In other words, with urban conditions that may have the problem of community overcrowding or a lot of people who access to public services, which may lead to boredom and decreasing on mental health.

CHAPTER 4

METHODOLOGY

4.1 Variables

4.1.1 Dependent variable

Mental health state is a dependent variable, which considered in this research. The assessment of mental health state was measured through the TMHI-15 form of the department of Mental health, Ministry of Public Health, Thailand. To assess a person's mental health status. Meanwhile, this assessment developed from the framework of the definition of mental health, the components of mental health (Domain: Mental state, Mental capacity, Mental quality, Supporting factors) and sub-elements of mental health (Subdomain). The results appear to be the norm of the study group as standard by categorized in 3 state included good mental health state (better than normal people), normal mental health state (equal to normal people) and poor mental health state (worse than normal people).

The questionnaire of TMHI-15 consists of 15 questions, the questions are asked to investigate yourself, assess your situation, symptoms, opinions, and feelings in which a person experiences in the past 1 month to the present for each question. For each question a person can answer 0 if it does not apply at all, 1 if it applies a little, 2 if it applies a lot and 3 if it extremely applies. Thus, for each question the point can range from 0 to 3. For 15 questions, the total points can range between 0 to 45 scores. In which the questions are demonstrated in table below.

Table3 shows the detail of question of Thailand Mental Health Indicator-15 edition used in this study, to reveal the question, mental health domain and subdomain of each question of this questionnaire.

Table 3 *Descriptive of TMHI-15 questions*

Question	Mental health domain	Mental health Subdomain
1. You feel satisfied with your life	Domain 1 Mental State	Subdomain 1.1 General well-being positive effect on mental state
2. You are at ease	Domain 1 Mental State	Subdomain 1.1 General well-being positive effect on mental state
3. You feel tired and dispirited with daily life	Domain 1 Mental State	Subdomain 1.2 General well-being negative effect on mental state (results inverted[1])
4. You feel disappointed in yourself	Domain 1 Mental State	Subdomain 1.2 General well-being negative effect on mental state (results inverted[1])
5. You feel that your life is suffering.	Domain 1 Mental State	Subdomain 1.2 General well-being negative effect on mental state (results inverted[1])
6. You can accept the problem that is difficult to solve, when there is a problem	Domain 2 Mental Capacity	Subdomain 2.3 Confidence in coping
7. You are confident that you be able to self-contained, when a critical or serious situation occurs	Domain 2 Mental Capacity	Subdomain 2.3 Confidence in coping
8. You are confident that you can encounter tragedy that occur in your life	Domain 2 Mental Capacity	Subdomain 2.3 Confidence in coping
9. You feel sympathy when others were suffering	Domain 3 Mental quality	Subdomain 3.1 Kindness and altruism
10. You feel happy to help others who got trouble	Domain 3 Mental quality	Subdomain 3.1 Kindness and altruism
11. You help others when you have the chance	Domain 3 Mental quality	Subdomain 3.1 Kindness and altruism
12. You feel proud of yourself	Domain 3 Mental quality	Subdomain 3.2 Self-esteem
13. You feel secure in your family	Domain 4 Supporting factors	Subdomain 4.2 Family support
14. If you have severe	Domain 4 Supporting	Subdomain 4.2 Family support

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

illness, you believe that your family will take good care of you	factors	
15. Your Family members have love and bond together	Domain 4 Supporting factors	Subdomain 4.2 Family support

[1] Since question number 3,4 and 5 are questions that assess mental health in terms of factors that decrease the respondent's level of mental health. Therefore, the evaluation of these three questions were reversed. If respondents answered the most in these questions, the score will be input as 0 and likewise the answer of never experience it, the score will be input as 3.

Table 4 shows the detail of dependent variables used in this study, to present the name and descriptive of each state of dependent variable. After answering those 15 questions from TMHI-15, the total score and range are between 0-45. From the range of 0-45, can categorize mental health into 3 states, as it shown in Table 4. And in the event that participants have the poor mental health score, they may help themselves first by requesting consultation services from public health facilities near your home (department of mental health, 2009).

Table 4 Detail of dependent variable

Variable	**Name**	**Description**
Mental Health (MH)	=3 if be Good mental health state	With scores in the range 35-45 from answering the TMHI-15 questionnaires
	=2 if be Normal mental health state	With scores in the range 27-34 from answering the TMHI-15 questionnaires
	=1 if be Poor mental health state	With scores in 26 or below from answering the TMHI-15 questionnaires

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

4.1.2 Independent Variables

Table5 shows the detail of the explanatory variables used in this study. It shows the name and description of every explanatory variables. The expected sign of effect on the dependent variables and the reasons are also shown in the table below.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Table 5 Detail of Independent variable

Name	Variable	Description	Expected sign	Reason
Notworking	Employment status	The employment status with four categories 1 if person who not working, = 0 otherwise	-	Those not-working had negative associated with mental health state. (Milner et al., 2014; Honkonen et al., 2007; Ford et al., 2010)
Agriculture		1 if person who in agricultural sector, = 0 otherwise	-	Farmers found to have less mental health than people who work in non-agricultural. sector (Edwards et al., 2015)
Industry		1 if person who in industrial sector, = 0 otherwise (omitted category)		
Services		1 if person who in services sector, = 0 otherwise	+	One of the examples of service sector is flight attendants, showing that they tend to have low stress (Puangsorn and Buathong, 2017)
Age1521	Age	The Age with four categories 1 if person who 15-21 years old, =0 otherwise (omitted category)		
Age2239		1 if person who 22-39 years old, =0 otherwise	-	The prevalence of mental health problem was higher in older people. (Bernarda et al., 2005; Torre et al., 2018)
Age4059		1 if person who 40-59 years old, =0 otherwise	-	
Age60above		1 if person who 60 onwards, =0 otherwise	-	

Male	Gender	1 if person is man and 0 if person is woman	+	Mental health problem prevalence among women. (Honkonen et al., 2007; Bernard et al., 2005)
Singled	Marital status	The marital status with five categories 1 if person who singled, = 0 otherwise (omitted category)		
Married		1 if person who married, = 0 otherwise	+	Those married had less prevalence on mental disorder than those unmarried (Honkonen et al., 2007)
Widowed		1 if person who widowed, = 0 otherwise	-	Those widowed, divorced or separated had strong negatively effects on happiness (Bernarda et al., 2005; Yiengprugsawan et al., 2011)
Divorced		1 if person who divorced, = 0 otherwise		
Other marital status		1 if person has other marital status (i.e. the majority of this category was separated), = 0 otherwise		
No education	Education level	The education stage with three categories 1 if person who were not educated, = 0 otherwise (omitted category)	-	
School without degree		1 if person has some schooling but without degree, = 0 otherwise	+	Those were lower educational level had more common on mental health problem (Taylor et al., 2004; Torre et al., 2018)
Bachelor’s degree above		1 if person who got bachelor's degree onwards, = 0 otherwise	+	
Head of household	Head of household	1 if person is head of household and	+/-	No literatures support the findings

		0 if person is not head of household		
Bangkok	Region	The region with five categories 1 if person who live in Bangkok, = 0 otherwise (omitted category)		
Central		1 if person who live in Central (not include Bangkok), = 0 otherwise	+/-	No literatures support the findings
North		1 if person who live in Northern, = 0 otherwise		
Northeast		1 if person who live in Northeastern, = 0 otherwise		
South		1 if person who live in Southern, = 0 otherwise		
Urban	Urban or Rural site	1 if person live in municipality area and 0 if person live in non-municipality area	-	The living in remote area could lead to decrease the number of mental disorders (Flatau et al., 2000)
Insufficient	Perception of income	The perception of income with four categories 1 if person perceive that not sufficient income during the past year, = 0 otherwise	-	Income has positive impact to mental health state (Yiengprugsawan et al., 2011; McMilan et al., 2010; Yur'yev et al., 2010)
Slightly sufficient		1 if person perceive that a slightly sufficient income during the past year, = 0 otherwise	-	

Sufficient		1 if person perceive that sufficient income during the past year, = 0 otherwise	-	
Very sufficient		1 if person perceive that very sufficient income during the past year, = 0 otherwise (omitted category)		
No self esteem	Self esteem	Self-esteem degree with four categories 1 if person had no self-esteem during a past month, = 0 otherwise (omitted category)		
Slight self esteem		1 if person had slight self-esteem during a past month, = 0 otherwise	+	The positive self-esteem could be factor that leading to happiness (Mann et al., 2004)
Moderate self esteem		1 if person had moderate self-esteem during a past month, = 0 otherwise	+	
High self esteem		1 if person had high self-esteem during a past month, = 0 otherwise	+	High self-esteem related to lower symptoms of both anxiety and depression (Henrikson et al., 2017)
No social interaction	Social interaction	Level of social interaction with four categories 1 if person had no social interaction during a past month, = 0 otherwise (omitted category)		
Slight social interaction		1 if person had slight social interaction during a past month, = 0 otherwise	+	There was a positive statistically significant association between amount of social interaction and level of life

Moderate social interaction		1 if person had moderate social interaction during a past month, = 0 otherwise	+	satisfaction. (Ono et al., 2011)
High social interaction		1 if person had high social interaction during a past month, = 0 otherwise	+	

Some of the variables in the table above need some further explanations, the first point is describing why choosing industrial sector as a reference group and why keeping the not working variable to be a part of the model. The reason for this study is to keep “not working” as one of the explanatory variables in the model since this study would like to highlight the impact of not-working on mental health, so the researcher needs to pick other employment category as a reference group. The second reason refers to the reference group of employment status, the researcher chose the industry sector because in this sector most of the jobs are considered as the most formal job among all the other remaining. According to these reasons, the interpretation for estimated coefficient of each employment status impact on their mental health state needs to be compared with the industrial sectors.

The second point is the explanation about the question that represents the 3 mechanisms consist of: income, self-esteem and social interaction, in which the questions are captured partially upon the exact term, those questions are explained in detail as follow.

For those questions that are relevant to income, since in the questionnaire does not include any questions about the amount of income that has been received but asking about the sufficiency of the income per year for those individuals. Since then, the researcher therefore chooses the question that represents a variant of income, so the question is “Do you have a sufficiency income in the past year?”. The answer that applies to this question will be a range of 0-3, which these ranges represent as 0 meaning is never, 1 given as slightly, 2 mean moderates and 3 given as the most.

For the question that will represent the self-esteem part, in the questionnaire will include the level of self-esteem. Since the following questions have been included in the assessment of mental health state, the researcher assumes that it is not appropriate to use as represent explanatory variable. Since then the researcher has chosen other questions that ask about the satisfaction for allocating individual time, this is also part of increasing self-esteem in the individual as where part of self-esteem that (Coopersmith, 1981) has given (i.e. general capacity, ability, performance and relationship with others). So, the question will represent self-esteem. The question is “Are you satisfy with how you allocate your working time, personal life and family?” The answer will be 0-3 stages, 0 meaning is never, 1 given as slightly, 2 mean moderates and 3 given as the most.

For social interaction, the researcher has chosen the question that applies as follow “Does friends or people in the society of yours help you when you needed help?”. Since social support is a part of social interaction, the researcher chooses this as a representation. The answer will be in 4 stages, 0-3; 0 meaning is never, 1 given as slightly, 2 means moderates and 3 given as the most.

4.2 Study Design

In this research uses Thailand Mental Health Indicator short form - 15 (TMHI-15) to define the mental health state of people which the total point is 45(continuous variable) then categorized to 3 categories, including:

- poor mental health state (score between 0 and 26),
- normal mental health state (score between 27 and 34),
- good mental health state (score between 35 and 45)

4.3 Econometric Model

With ordered categorical dependent variable, one appropriate econometric model is ordered logit model as outlined below. The study will include full sample of all working status as well as subsample of those who work and not work separately.

The reasons for including subsample analysis is to investigate the effect of sociodemographic variables that have an impact on mental health, since they are having the different impact across the two groups (i.e. working and not working). This could answer the 3rd and 4th hypothesis that focus on gender and educational stage, how the sociodemographic can affect the mental health state. If the researcher found the factors that deteriorate the mental health state, so the government might be able to find a policy to deal with these factors. In contrast, if the researcher found the factors that improve the mental health state, the proper support could be implemented for those particular group of people who were working or not working.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Likewise, the result from the aspect “community characteristic” can also indicate how regional living and urbanization could have impact on a mental health state of those who are working and not working. So, the government can gear the policy of improving the mental health state to be more suitable for the different community characteristic between those who are working and not working.

Full sample analysis

$$MH^* = \beta_0 + \beta_1 Notworking + \beta_2 Agri + \beta_3 Service + \beta_4 Age2239 + \beta_5 Age4059 + \beta_6 Age60above + \beta_7 Male + \beta_8 Married + \beta_9 Widowed + \beta_{10} Divorced + \beta_{11} Othermari + \beta_{12} Schwithodeg + \beta_{13} Bachelorabove + \beta_{14} Headhouse + \beta_{15} Central + \beta_{16} North + \beta_{17} Northeast + \beta_{18} South + \beta_{19} Urban + \beta_{20} Insuffi + \beta_{21} Slighsuffi + \beta_{22} Suffi + \beta_{23} Slightself + \beta_{24} Modself + \beta_{25} Highself + \beta_{26} Slightsoc + \beta_{27} Modsoc + \beta_{28} Highsoc + \varepsilon_i$$

Sub sample analysis

$$MH^* = \beta_0 + \beta_1 Age2239 + \beta_2 Age4059 + \beta_3 Age60above + \beta_4 Male + \beta_5 Married + \beta_6 Widowed + \beta_7 Divorced + \beta_8 Othermari + \beta_9 Schwithodeg + \beta_{10} Bachelorabove + \beta_{11} Headhouse + \beta_{12} Central + \beta_{13} North + \beta_{14} Northeast + \beta_{15} South + \beta_{16} Urban + \beta_{17} Insuffi + \beta_{18} Slightsuffi + \beta_{19} Suffi + \beta_{20} Slightself + \beta_{21} Modself + \beta_{22} Highself + \beta_{23} Slightsoc + \beta_{24} Modsoc + \beta_{25} Highsoc + \varepsilon_i$$

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

MH* is a latent index which assume to have linear function with parameters and is a function of many observed explanatory variables as well as the error term, ε. The research observes mental health state, MH, which is an ordered categorial variable.

For MH defined Mental Health, this research used ordered logistic regression to analyze the effect of each factor on this outcome.

For the data analysis of MH, the model should be represented like this:

$Y_i = 1 \rightarrow$ poor mental health state

$= 2 \rightarrow$ normal mental health state

$= 3 \rightarrow$ good mental health state

Assuming that the error term has logistic distribution, the following probability expressions can be obtained:

$$\Pr(Y_i=1) = \frac{e^{\left(c_1-\left(\beta_1 X_{1i}+\cdots+\beta_k X_{ki}\right)\right)}}{1+e^{\left(c_1-\left(\beta_1 X_{1i}+\cdots+\beta_k X_{ki}\right)\right)}}$$

$$\Pr(Y_i=2) = \frac{e^{\left(c_2-\left(\beta_1 X_{1i}+\ldots+\beta_k X_{ki}\right)\right)}}{1+e^{\left(c_2-\left(\beta_1 X_{1i}+\ldots+\beta_k X_{ki}\right)\right)}} - \frac{e^{\left(c_1-\left(\beta_1 X_{1i}+\ldots+\beta_k X_{ki}\right)\right)}}{1+e^{\left(c_1-\left(\beta_1 X_{1i}+\ldots+\beta_k X_{ki}\right)\right)}}$$

$$\Pr(Y_i=3) = 1 - \frac{e^{\left(c_3-\left(\beta_1 X_{1i}+\ldots+\beta_k X_{ki}\right)\right)}}{1+e^{\left(c_3-\left(\beta_1 X_{1i}+\ldots+\beta_k X_{ki}\right)\right)}}$$

Where c_1, c_2 and c_3 are the cutoff points that will be estimated along with the coefficients.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Note that, the explanatory variables in these probability expressions are corresponded to those variables listed in the full-sample and sub sample analysis above.

These probabilities' expressions will be used to form likelihood function, which later be maximized to get the coefficient estimates. For the sign of coefficient shows the direction of marginal effect for the highest category whereas the direction of the marginal effect of the lowest category will be opposite from the sign of the coefficient.

Once the coefficient estimates were obtained and the best specification chosen, the marginal effect was calculated to investigate the effect of explanatory variables on the probability of mental health. Marginal effect is defined as $\partial \Pr(Y=j)/\partial X_k$ when X is continuous variable, the following marginal effects can be obtained:

$$\frac{\partial Pr(Y=j)}{\partial X_k} = \frac{\partial F(C_j - (\beta_1 X_1 + \cdots + \beta_k X_k))}{\partial X_k} - \frac{\partial F(C_{j-1} - (\beta_1 X_1 + \cdots + \beta_k X_k))}{\partial X_k}$$

$$= \beta_k [f\left(C_{j-1} - (\beta_1 X_1 + \cdots + \beta_k X_k)\right) - f\left(C_j - (\beta_1 X_1 + \cdots + \beta_k X_k)\right)]$$

and $\Pr(Y=j \mid X=1) - \Pr(Y=j \mid X=0)$ for X that is dummy variable.

Where these explanatory variables (i.e. X_1 to X_k) are corresponding to the list of explanatory variables in the full-sample analysis and sub-sample analysis above.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

CHAPTER 5

DATA

5.1 Mental health survey

Thailand Mental Health Index (TMHI) version 2007 is the questionnaire which researcher utilizes for measured Mental Health state in the study, this questionnaire is constructed by Mongkol, et.al. (2007) under the Department of Mental Health.
This questionnaire has two objectives:

1. To develop a tool to measure the mental health indicators of Thai people.
2. To find the norm, which is used as the criterion for determining mental health

The TMHI 2007 that is widely used currently, there are both full (55 items) and short (15 items) version, with 4 domains (mental state, mental capacity, mental quality, supporting factors) and 15 sub-domains. For this research, the researcher used the short version (15 items).

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

5.2 Data Sampling

The data sampling for this research comes from the 2014 survey on Conditions of Society, Culture and Mental Health (Thai happiness) which prepared by the National Statistical Office of Thailand. The survey utilized stratified two-stage sampling method, in which all the provinces are the stratum, hence in total there are 77 stratums. For each stratum except Bangkok, the sub stratum was created which are municipality and non – municipality area. The enumeration area (EA) is the primary sampling, and those secondary sampling is household level. For the secondary sampling, the size of sample in sub stratum of municipality area is 16 households per

EA, and non-municipality area is 12 households per EA. Then the representative households were selected randomly.

5.3 Sample Size

This survey is taken place from a sample of 27,960 households across the regions, when omitting missing variables, the total number of respondents are 75,560.

5.4 Data cleaning process

The total number of those who response is total of 75,560, excluding those respondents with age less than 15 years old, due to the reason that they did not answer the mental health questions. For those who did not answer are in the total of 42,553 this cause the sample to leave with 33,007 from 75,560. Continually exclude those did not fully complete with other part of the questions in the total of 37 people this left with net full sample of 32,970 people.

And for the sub sample analysis for the not-working group have been exclude of the total of 23,710 people from net sample from full sample analysis, this left with 9,260 people for sub sample (not working) analysis. Same as sub sample analysis for working group has exclude in total of 9,260 people from net sample of full sample analysis, this make the total of 23,710 people for sub sample (working) analysis.

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

CHAPTER 6

RESULTS AND DISCUSSION

6.1 Overview of the Dataset

In this research, researcher utilizes secondary data from the 2014 survey on Conditions of Society, Culture and Mental Health (Thai happiness) which prepared by the National Statistical Office of Thailand. There are 32,790 participants aged 15 and above included in the study.

6.2 Summary of the Statistics for the Total Sample

Table 6 shows summary statistics for the total sample. For the sample, the mean of three categories of mental health state shows most of participants fell into the second category: normal mental health state (56.6%). Also, the smallest group of people were found to have poor mental health state at only 7.1%. There were 36.2% of people who had good mental health state than normal people.

The mean for four categories of employment status shows that most people most of sample were in agricultural sector (33.5%). Also, the smallest group of people were employed in industrial sector at 7.1%. There were 28.1% of the people who were not working. Furthermore, 31.4% of the sample are employed in the service sector.

In terms of socioeconomics-demographic aspects, there were slightly more females (59.2%) than male (40.8%) in the whole sample. Most of participants were aged over 40 years old (72.17%). The majority (67.9%) of them are married, with about 14.9% of them singled and the remaining 17.9% were either widowed, divorced or having other marital status. About education level, 85.8% of them are school without degree (school without degree, including primary school, middle school, high school and vocational education), 9.9% of them have bachelor and above degree and only 4.3% of them have no education. In terms of income, perception of enough income were utilized in this study, that were about 47.1% of participants felt that they

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

have sufficient income, 42.4% of them felt that their income was slightly sufficient and about 5.8% of them perceived their income as insufficient and about 4.8% of the sample feel very satisfied their income. About 51.1% of participant were head of household and 48.9% were not.

For the community factors, most of the sample (28.4%) lived in northeast of Thailand and the least about 16.6% lived in southern part of Thailand. Also, most people in the sample lived in urban areas (54.6%).

And in term of mechanism that transmit the effect of employment to mental health state, the majority self-esteem level of participants was moderate self-esteem (73.62%) and also the most state of social interaction term of samples was moderate social interaction (69.61%).

Table 6 Summary of all variable for the total sample

Variable	Obs.	Mean	Std. Dev.	Min	Max
Poor mental health	32970	.071	.257	0	1
Normal mental health	32970	.566	.496	0	1
Good mental health	32970	.362	.481	0	1
Notworking	32970	.281	.449	0	1
Agriculture	32970	.335	.472	0	1
Industry	32970	.071	.256	0	1
Services	32970	.314	.464	0	1
Male	32970	.408	.491	0	1
Female	32970	.592	.491	0	1
Age1521	32970	.083	.275	0	1
Age2239	32970	.196	.397	0	1
Age4059	32970	.452	.498	0	1
Age60above	32970	.27	.444	0	1
Singled	32970	.149	.356	0	1
Married	32970	.679	.467	0	1
Widowed	32970	.123	.328	0	1
Divorced	32970	.021	.142	0	1
Other marital status	32970	.029	.168	0	1
No education	32970	.043	.203	0	1
School without degree	32970	.858	.349	0	1
Bachelor'sdegree above	32970	.099	.299	0	1

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Insufficient	32970	.058	.233	0	1
Slightly sufficient	32970	.424	.494	0	1
Sufficient	32970	.471	.499	0	1
Very sufficient	32970	.048	.213	0	1
Head of household	32970	.511	.5	0	1
Not head	32970	.489	.5	0	1
Bangkok	32970	.041	.199	0	1
Central	32970	.269	.443	0	1
North	32970	.239	.427	0	1
Northeast	32970	.284	.451	0	1
South	32970	.166	.372	0	1
Urban	32970	.546	.498	0	1
Rural	32970	.454	.498	0	1
No social interaction	32970	.006	.078	0	1
Slight social interaction	32970	.166	.372	0	1
Moderate social interaction	32970	.696	.46	0	1
High social interaction	32970	.132	.338	0	1
No self-esteem	32970	.003	.057	0	1
Slight self-esteem	32970	.061	.24	0	1
Moderate self-esteem	32970	.736	.441	0	1
High self esteem	32970	.2	.4	0	1

6.2.1 Descriptive Statistics for several variables

This part shows the descriptive statistics for several selected variables of the total sample. For mental health, mean of three categories of mental health state shows that most of participants fall into the second category of normal mental health state (56.6%). Also, the smallest group of people are found to have poor mental health state at only 7.1%. There are 36.2% of people who had good mental health state.

Table 7 shows the mean for four categories of employment status that the summary statistics show that most people are working in agricultural sector (33.5%). Also, the smallest group of people are employed in industrial sector at 7.1%. There are 28.1% of the people who are not working. This include those who are unemployed as well as those not in the labor force. Furthermore, 31.4% of the sample are employed in the service sector.

Most participants are female (59.2%), that aged over 40 years old (72.17%), the majority of them are married (67.90%). For educational stage, 85.8% of them have schooling without bachelor's degree. The largest proportion of the sample perceived that their income is sufficient (47.1%) and live in urban area (54.56%).

In term of mechanism variables, the percentage of participants who have no social interaction are twice higher than those have no self-esteem (0.62%>0.33%). While in the case of high level of both variables, the percentage of participants who have high level of self-esteem is higher than those who have high level of social interaction (19.95%>13.18%).

Table 7 Frequency, Percentage of each variable characteristics (N=32,970)

Variables characteristics	**Frequency**	**Percent**
Mental health state		
- poor mental health	2,349	7.12
- normal mental health	18,675	56.64
- good mental health	11,946	36.23
Employment status		
- not working	9,260	28.09
- agricultural sector	11,039	33.48
- industrial sector	2,332	7.07
- services sector	10,339	31.36
Age group		
15-21	2,721	8.25
22-39	6,453	19.57
40-59	14,893	45.17
≥60	8,903	27.00
Gender		
- Male	13,445	40.78
- Female	19,525	59.22
Marital status		
- Singled	4,901	14.87
- Married	22,382	67.89
-Widowed	4,049	12.28
- Divorced	677	2.05
-Other	961	2.91

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Education level		
-No education	1,418	4.30
- School without bachelor's degree	28,277	85.77
-Bachelor's degree and above	3,275	9.93
Perception on income		
- Insufficient income	1,897	5.75
- Slightly sufficient	13,966	42.36
- Sufficient	15,531	47.11
- Very sufficient	1,576	4.78
Living region		
- Bangkok	1,363	4.13
- Central	8,872	26.91
- Northern	7,887	23.92
- Northeastern	9,364	28.40
- Southern	5,484	16.63
Being head of household		
- Yes	16,853	51.12
- No	16,117	48.88
Type of living area site		
- Urban	17,990	54.56
- Rural	14,980	45.44
Social interaction state		
-No social interaction	203	0.62
-Slight social interaction	5471	16.59
-Moderate social interaction	22952	69.61
-High social interaction	4344	13.18
Self-esteem state		
-No self esteem	109	0.33
-Slight self esteem	2011	6.10
-Moderate self esteem	24273	73.62
-High self esteem	6577	19.95

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

6.3 Summary of the Statistics for the Sub Sample

Table 8 reveals the summary statistics for the sub sample of participants who are working and not-working. For poor mental health state, the mean of not-working samples is the highest, higher than that of the total sample and working sample, sequentially (0.09>0.071>0.064). For good mental health state, the mean of working

participants is the highest, higher than those not-working group (0.372>0.337). Compared to the total sample, the situation of the poor mental health state on the those not-working is more severe.

In the sub sample, the proportion of women are still more than men like total sample, especially in not-working group, there is higher proportion of females than that of the working group (0.697>0.551). For the age group the majority are not similar in not-working and working sample. The majority of not working were those aged 60 and or above group (0.555) while in the working group the majority were those aged 40 to 59 years old (0.554). Married still constitutes at the majority marital status for both not-working (0.508) and working (0.746) sample, like the total sample (67.89%). For the educational stage, the mean of those who have no education in not-working sample group is higher than in the working group (0.71 > 0.32) while the mean of those have bachelor's degree or above, are higher in those working group than not-working group (0.112>0.068). And in term of being head of household, the majority of those who are not-working is not head of household (0.529) while the majority of those who are working is head of household (0.527).

In term of community characteristics, the percentage of those living in Bangkok are the least for both not-working group (5.2%) and working group (3.7%), like the total sample. Also, the mean of participants who living in urban are the majority in both sub-samples (0.586 and 0.53) like the total sample.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

For the mechanism variables, social interaction terms of both groups, the percentage of moderate social interaction is the highest (0.682 and 0.702). Another finding is for social interaction variable. It is found that no social interaction is less prevalent among those who are working and more prevalent for those non-working group (0.005 < 0.01). Then, for self-esteem variable, our statistic reveals that high level of self-esteem is found among those working, which is higher than the not-working group (0.398 >0.21).

Table 8 Summary of statistics for the sub-sample (not-working and working)

	Not Working		Working	
Variables	Mean	Std.Dev.	Mean	Std.Dev.
Poor mental health	.09	.286	.064	.245
Normal mental health	.573	.495	.564	.496
Good mental health	.337	.473	.372	.483
Male	.303	.459	.449	.497
Female	.697	.459	.551	.497
Age 15-21	.178	.383	.045	.208
Age 22-39	.078	.267	.242	.428
Age 40-59	.19	.392	.554	.497
Age 60 or above	.555	.497	.159	.366
Singled	.197	.398	.13	.336
Married	.508	.5	.746	.435
Widowed	.259	.438	.07	.254
Divorced	.014	.117	.023	.15
Other marital status	.022	.146	.032	.176
No education	.071	.256	.032	.177
Schooling without bachelor's degree	.862	.345	.856	.351
Bachelor's degree or above	.068	.251	.112	.315
Being Head of household	.471	.499	.527	.499
Not be head of household	.529	.499	.473	.499
Bangkok	.052	.223	.037	.189
Central	.294	.456	.259	.438
North	.241	.428	.238	.426
Northeast	.249	.433	.298	.457
South	.162	.369	.168	.374
Urban	.586	.493	.53	.499
Rural	.414	.493	.47	.499
Insufficient income	.126	.332	.031	.173
Slightly sufficient	.465	.499	.407	.491
Sufficient	.371	.483	.51	.5
Very sufficient	.037	.19	.052	.222
No social interaction	.01	.098	.005	.069
Slight social interaction	.179	.383	.161	.367
Moderate social interaction	.682	.466	.702	.458
High social interaction	.129	.335	.133	.339
No self-esteem	.008	.09	.001	.038
Slight self-esteem	.054	.226	.064	.244

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Moderate self-esteem	.733	.442	.737	.440
High self-esteem	.21	.403	.398	.398
Total observation	9260		23710	

6.4 Cross tabulation between mental health and important variables

Before regression, the cross-tabulation of selected explanatory variables and mental health state will be shown in this part. From the cross-tabulations, a preliminary assessment of the relationship between important explanatory variables and dependent variables will follow.

Table 9 shows the percentage of mental health state in each employment status. There were 2349 participants who were poor mental health state, 18675 people who normal mental health state and 11946 who had good mental health. Of the participants were not-working, 9% of participants were had poor mental health. In agriculture sector, 6.44% of participants fell into the poor mental health group. Of the samples who worked in industry sector, 7.2% had poor mental health and 6.16% of participants worked in services sector were in poor mental health state. Comparing across the row of poor mental health state, one can see that the largest proportion belongs to those who not working (i.e. 9%). On the other hand, comparing across the row of good mental health, the largest proportion (i.e. 39.6%) occurs for those working in service sector and the smallest proportion is found for not working people. For the chi-square test, the p-value is equal to 0.000, which is less than 0.05. This means that the H_0 was rejected and thus the mental health state and employment status are not independent of each other. That is mental health state significantly differs across employment status

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Table 9 Cross-tabulation between mental health state and employment status

	Employment status				
Mental health state	Not-working	Agriculture	Industry	Service	Total
Poor mental health	833	711	168	637	2349
	(35.46%)	(30.27%)	(7.15%)	(27.12%)	(100%)
	(9.00%)	(6.44%)	(7.20%)	(6.16%)	(7.12%)
Normal mental health	5310	6430	1325	5610	18675
	(28.43%)	(34.43%)	(7.10%)	(30.04%)	(100%)
	(57.34%)	(58.25%)	(56.82%)	(54.26%)	(56.64%)
Good mental health	3117	3898	839	4092	11946
	(26.09%)	(32.63%)	(7.02%)	(34.25%)	(100%)
	(33.66%)	(35.31%)	(35.98%)	(39.58%)	(36.23%)
Total	9260	11039	2332	10339	32970
	(28.09%)	(33.48%)	(7.07%)	(31.36%)	(100%)
	(100%)	(100%)	(100%)	(100%)	(100%)
Pearson chi2(6) =	133.9055	Pr =	0.000		

Table 10 shows the observations and percentage for mental health state across gender. As can be from *table 10*, from the sample of this study, there were 19525 females and 13445 males. As for mental health state related to gender, 7.51% of female had poor mental health and 6.56% of male had poor mental health. So, a slightly higher percentage of female were found to have poor mental health state compared to male. Furthermore, for good mental health, higher percentage of male (i.e. 38.56%) have good mental health state than female (i.e. 34.63%)

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Table 10 Cross-tabulation between mental health state and gender

	Gender		
Mental health state	**Female**	**Male**	**Total**
Poor mental health	1467	882	2349
	(7.51%)	(6.56%)	(7.12%)
Normal mental health	11296	7379	18675
	(57.85%)	(54.88%)	(56.64%)
Good mental health	6762	5184	11946
	(34.63%)	(38.56%)	(36.23%)
Total	19525	13445	32970
	(100.00%)	(100.00%)	(100.00%)
Pearson chi2(2) =	56.4136 Pr =	0.000	

Table 11 shows the percentage of mental health state across age group. As can be seen from *table 11*, across all age groups, the majority of the sample falls into normal mental health. Nevertheless, for poor mental health, it is found that the largest portion occurs among the age 40-59 years old (i.e. 41.68%). For good mental health state, the age group with the highest proportion is those in 40-59 years old range. The chi-square test shows mental health and age were not independent each other (Pr=0.00<0.05). This means mental health state significantly differs across age groups.

Table 11 Cross-tabulation between mental health state and age group

	Age group				
Mental health state	**15-21**	**22-39**	**40-59**	**≥60**	**Total**
Poor mental health	165	475	979	730	2349
	(7.02%)	(20.22%)	(41.68%)	(31.08%)	(100.00%)
Normal mental health	1595	3692	8309	5079	18675
	(8.54%)	(19.77%)	(44.49%)	(27.20%)	(100.00%)
Good mental health	961	2286	5605	3094	11946
	(8.04%)	(19.14%)	(46.925)	(25.90%)	(100.00%)
Total	2721	6453	14893	8903	32970
	(8.25%)	(19.57%)	(45.17%)	(27.00%)	(100.00%)
Pearson chi2(6) =	45.2559 Pr =		0.000		

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Table 12 reveals the percentages of participants mental health and educational stage. There were 1418 people who had no education, 28277 had some schooling but without degree and 3275 those who had bachelor's degree and above. In those no education, 10.93% of samples were in poor mental health state. For those who had some schooling but without degree, 7.35% of samples had poor mental health. And for those had bachelor's degree onward, 3.57% were in poor mental health state. This shows that the largest proportion of people with no educated is found among those with normal mental health. Conversely, the cross tabulation shows that 49.4% of those with university degree tends to have good mental health states, which is much higher than other education categories. The p-value of the chi-square test was 0.00, which was less than 0.05, therefore the educational stage and mental health were not independent of each other and mental health states significantly varies across education level.

Table 12 Cross-tabulation between mental health state and educational stage

	Educational stage			
Mental health state	**No education**	**School without bachelor's degree**	**Bachelor's degree and above**	**Total**
Poor mental health	155 (10.93%)	2077 (7.35%)	117 (3.57%)	2349 (7.12%)
Normal mental health	892 (62.91%)	16244 (57.45%)	1539 (46.99%)	18675 (56.64%)
Good mental health	371 (26.16%)	9956 (35.21%)	1619 (49.44%)	11946 (36.23%)
Total	1418 (100.00%)	28277 (100.00%)	3275 (100.00%)	32970 (100.00%)
Pearson chi2(4) =	361.0586	Pr =	0.000	

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Table 13 shows the percentage of participants mental health across region. There were 1363 people lived in Bangkok, 8872 lived in central of Thailand, 7887 lived in north of Thailand, 9364 lived in northeast of Thailand and 5484 lived in south. The majority of the sample falls into normal mental health state regardless of region of residence. However, among people with poor mental health, the highest percent is found in Central region (i.e. 34.27%) and the least is found in the Southern (i.e. 12.26%). Among those with good mental health state, the highest proportion is found for those living in the Northeastern (i.e. 28.44%). The p-value of the chi-square test was 0.00, which was less than 0.05, therefore the living region and mental health were not independent of each other and this means mental health state significantly changes across living region.

Table 13 Cross-tabulation between mental health state and region

	Region					
Mental health state	**Bangkok**	**Central**	**North**	**Northeast**	**South**	**Total**
Poor mental health	99	805	504	653	288	2349
	(4.21%)	(34.27%)	(21.46%)	(27.80%)	(12.26%)	(100.00%)
Normal mental health	774	5098	4374	5314	3115	18675
	(4.14%)	(27.30%)	(23.42%)	(28.46%)	(16.68%)	(100.00%)
Good mental health	490	2969	3009	3397	2081	11946
	(4.10%)	(24.85%)	(25.19%)	(28.44%)	(17.42%)	(100.00%)
Total	1363	8872	7887	9364	5484	32970
	(4.13%)	(26.91%)	(23.92%)	(28.40%)	(16.63%)	(100.00%)
Pearson chi2(8) =	114.9110	Pr =	0.000			

Table 14 shows the percentage of participants' mental health state across perception of income. As can be from *table 14*, from the sample of this study, there were 1897 people who perceive their income were insufficient, 13966 people those perceive slightly sufficient income, 15531 people who feel their income is sufficient and 1576 people whose income is very sufficient. Among those who perceived their income not sufficient, 21.45% had poor mental health and for those who felt their income were very sufficient for them, 1.46% had poor mental health. This shows that having high perceived income seems to be associated with lower poor mental health. As expected for good mental health state, it is found that the largest proportion falls upon those who perceive their income to be very sufficient and the smallest proportion happens for those who report having insufficient income. The p-value of the chi-square test was 0.00, which was less than 0.05, therefore the perception of income and mental health were not independent of each other and this could imply mental health state significantly differs across the individually perception of income.

Table 14 Cross-tabulation between mental health state and perception of income

	Perception of income				
Mental health state	**Insufficient**	**Slightly sufficient**	**Sufficient**	**Very sufficient**	**Total**
Poor mental health	407	1464	455	23	2349
	(21.45%)	(10.48%)	(2.93%)	(1.46%)	(7.12%)
Normal mental health	1061	8984	8287	343	18675
	(55.93%)	(64.33%)	(53.36%)	(21.76%)	(56.64%)
Good mental health	429	3518	6789	1210	11946
	(22.61%)	(25.19%)	(43.71%)	(76.78%)	(36.23%)
Total	1897	13966	15531	1576	32970
	(100.00%)	(100.00%)	(100.00%)	(100.00%)	(100.00%)
Pearson chi2(6) =	3,300	Pr =	0.000		

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Table 15 represents the percentage of participants mental health among each level of social interaction. From the table 15, there were total 32,970 respondents, and 0.62% of them felt that they had no social interaction, while 13.18% of them felt that they had high level of social interaction with others and the majority of them (69.91%) felt that they had social interaction in moderate degree. If investigating poor mental health state further, the largest percentage of respondents answered that they had moderately social interaction (48.49%). And for those who had good mental health state, they answered that they had high social interaction with the highest percentage (26.9%). The p-value of the chi-square test was 0.00, which was less than 0.05, therefore the social interaction and mental health were not independent of each other and this means mental health state significantly changes across degree of social interaction.

Table 15 Cross-tabulation between mental health state and social interaction

	Social interaction				
Mental health state	**No Interaction**	**Slight interaction**	**Moderate Interaction**	**High interaction**	**Total**
Poor mental health	39	1088	1139	83	2349
	(1.66%)	(46.32%)	(48.49%)	(3.53%)	(100.00%)
Normal mental health	122	3473	14032	1048	18675
	(0.65%)	(18.60%)	(75.14%)	(5.61%)	(100.00%)
Good mental health	42	910	7781	3213	11946
	(0.35%)	(7.62%)	(65.13%)	(26.90%)	(100.00%)
Total	203	5471	22952	4344	32970
	(0.62%)	(16.59%)	(69.61%)	(13.18%)	(100.00%)

Pearson chi2(6) = 4.9e+03 Pr = 0.000

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Table 16 shows the observations and percentages for mental health state of participants across each level of self-esteem degree. As can be seen from table 16, 73.62% of total sample in this study, felt that they had self-esteem in moderate level while 0.33% of total sample felt that they had no self-esteem. Specifically, in those who have no self-esteem, they had the poor mental health state with highest percentage comparing to those in other mental health states (39.4%>35.78%>24.77%). For those had high self-esteem, the percentage of people who had good mental health state, is the highest when comparing to those had similar level of self-esteem in other mental health state (71.92%>26.32%>1.76%). And the chi-square test reveals that mental health and self-esteem were not independent each other (Pr=0.00<0.05). This means mental health state significantly differs across self-esteem level.

Table 16 Cross tabulation mental health across self esteem

	Self esteem				
Mental health state	**No self esteem**	**Slight self esteem**	**Moderate self esteem**	**High self esteem**	**Total**
Poor mental health	43	640	1550	116	2349
	(1.83%)	(27.25%)	(65.99%)	(4.94%)	(100%)
	(39.4%)	(31.82%)	(6.39%)	(1.76%)	(7.12%)
Normal mental health	39	1104	15801	1731	18675
	(0.21%)	(5.91%)	(84.61%)	(9.27%)	(100.00%)
	(35.78%)	(54.90%)	(65.10%)	(26.32%)	(56.64%)
Good mental health	27	267	6922	4730	11946
	(0.23%)	(2.24%)	(57.94%)	(39.59%)	(100%)
	(24.77%)	(13.28%)	(28.52%)	(71.92%)	(36.23%)
Total	109	2011	24273	6577	32970
	(0.33%)	(6.10%)	(73.62%)	(19.95%)	(100%)
	(100%)	(100%)	(100%)	(100%)	(100%)
Pearson chi2(6) = 70.98		Pr = 0.000			

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

6.5 Result of each regression

In this section, ordered logit regressions are employed for investigating the effect of each employment status, socio-demographic factors, community characteristic factors and channel in which employment may affect mental health state. The analyses were divided to full-sample analysis and sub-sample analysis to see the outcomes from all sample and specifically different outcomes of those working and those who were not working. An empirical estimation was conducted for both full sample as well as sub sample of those working and not working and the coefficient estimates could show the direction of effects of each factor on the outcome of the highest mental health state whether there are a positive or negative impact. Also, the likelihood ratio test is utilized to choose the best model for both full sample and sub sample. Moreover, the marginal effects analysis was utilized to see the magnitude of impact of each variable on each mental health state: poor, normal and good mental health state.

6.5.1 Estimated coefficient of the factors affecting mental health state of full samples

In this part, 4 regressions for mental health state of full-sample analysis with different sets of explanatory variables, which were utilized to find out which set of independent variables were suitable with the data. Using the likelihood-ratio test to calculate to show the explanatory power of additional variables. The standard of a P-value less than 0.05 was employed to discover that the coefficients of the additional variables were statistically significance.

For Ordered Logit Regression of mental health state of full-sample analysis; Model 1 utilized to see the impact of only employment status on mental health state, Model 2 and 3 were added to socio-demographic term and community characteristic to see the effect of individually character and living environment on mental health state. And for model 4, the additional terms of possible channels in which employment may influence on mental health state were analyzed. Which is, the variables capturing social interaction and self-esteem.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

In the end, likelihood-ratio test given the results that Model 4 is the most significant model that suit with full-sample analysis, due to P-Value that less than 0.05. This shows that by adding all explanatory variable together will be given the best results, which is shown in Table 17. Estimated coefficient that got from running Model 4 can only be providing the direction of explanatory variable, which affect how the good mental health state is dedicate. But it couldn't refer on how much impact towards the direction that been given on explanatory variable. On the other hand, using marginal effect analysis can help refer with the amount of the direction.

Based on final model of full analysis, the results were interpreted as follows in column (i) of *Table 20.*

In term of employment status, there are 2 sectors that had negatively significant relationship including those were not working and those who worked in an agriculture sector when comparing with industrial sector, which is as expected before. While those employed in service sector was not statistically significant with negative coefficient.

Age is significantly related to mental health state at the 1% level in negative way, including age group between 22 – 39 years old, 40 – 59 years old and for elderly group (i.e. aged 60 above) when comparing to age group between 15 – 21. The result refers as direction of estimated coefficient that took place like expected. Being male is a positive significantly related to good mental health state at 1% significant level, when comparing to female.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

In the case of marital status, to be discovered that married was significant at 1% level with positively, comparing with single status. Any other way, the estimated coefficient of other marital status it's significantly negative, at the percentage of significant at 5 % level, comparing to single group.

In the educational stage, getting educated not only getting the bachelor's degree and above but also going to school without getting bachelor's degree were positive significantly at the 1% level. Comparing to no education group. Being head of household was negative significantly associated to mental health state at the 5% level, comparing to not being a head of household group.

For community characteristics, estimate coefficient of the population that living in Central and Northeast area was negatively significant at the 1% level, comparing with those who lived in Bangkok.

Lastly, for the mechanisms of employment that effect on mental health state, firstly the degree of sufficient in their income were negative significantly associated with a good mental health state based on very sufficient level, which the result similar as expected before. Secondly, the degree of self-esteem showed that having moderately self-esteem onwards were positive significantly related to good mental health state, comparing with no self-esteem group. Likewise, the degree of social interaction that revealed having moderately social interaction onwards were positive significant comparing with no social interaction. Together with these three mechanisms the result appears to be significant as 1% level.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Table 17 Estimated coefficient and likelihood-ratio test of full sample model

	Model 1: only employment status variables		***Model 2: adding socio-demographic variables***		***Model 3: adding community characteristic variables***		***Model 4: adding mechanism variables***	
Variables	**Coef.**	**SE**	**Coef.**	**SE**	**Coef.**	**SE**	**Coef.**	**SE**
Notworking	-0.131***	0.046	-0.121**	0.049	-.0163***	0.049	-0.161***	0.054
Agriculture	-0.005	0.045	-0.034	0.046	-0.106**	0.047	-0.214***	0.051
Industry			Reference					
Services	0.155***	0.045	0.053	0.046	0.012	0.046	-0.063	0.05
Age15-21							Reference	
Age2239			-0.284***	0.052	-0.275***	0.052	-0.321***	0.056
Age4059			-0.11**	0.051	-0.099*	0.051	-0.241***	0.055
Age60above			-0.078	0.053	-0.065	0.053	-0.213***	0.057
Male			0.149***	0.025	0.146***	0.025	0.157***	0.027
Singled							Reference	
Married			0.277***	0.037	0.266***	0.037	0.25***	0.04
Widowed			-0.048	0.053	-0.063	0.053	-0.061	0.057
Divorced			-0.128	0.086	-0.147*	0.086	-0.099	0.092
Other marital			-0.342***	0.075	-0.334***	0.075	-0.212**	0.079
No education							Reference	
School without bachelor's degree			0.365***	0.056	0.412***	0.057	0.264***	0.06
Bachelor's degree above			0.991***	0.067	1.037***	0.068	0.604***	0.073
Being head of household			-0.094***	0.026	-0.089***	0.026	-0.055**	0.028
Bangkok							Reference	
Central					-0.055	0.059	-0.309***	0.064
North					0.21***	0.06	0.017	0.065
Northeast					0.091	0.06	-0.184***	0.065
South					0.205***	0.062	-0.038	0.067
Urban					0	0.023	0.022	0.025
Insufficient income							-1.964***	0.086

Slightly sufficient							-1.551***	0.07
Sufficient							-0.899***	0.073
Very sufficient							Reference	
No self-esteem							Reference	
Slight self-esteem							-0.061	0.221
Moderate self-esteem							1.142***	0.216
High self-esteem							2.586***	0.218
No social interaction							Reference	
Slight social interaction							-0.125	0.154
Moderate social interaction							0.752***	0.153
High social interaction							1.86***	0.157
Constant	-2.562	0.045	-2.164	0.083	-2.074	0.1	-2.221	0.284
Constant	0.578	0.041	1.017	0.082	1.114	0.099	1.57	0.285
Chi-square (df)	103.380(3)		720.883(14)		813.423(19)		9383.056(28)	
Prob > chi2	0.000		0.000		0.000		0.000	
LR-test of incremental variables								
	Model 1		**Model 2**		**Model 3**		**Model 4**	
H_0			Model 1		Model 2		Model 3	
H_1			Model 2		Model 3		Model 4	
F-statistic			617.5 ***		92.54***		8569.63***	
Sample size	32,970		32,970		32,970		32,970	
*** p-value<.01, ** p-value<.05, * p-value<.1								

6.5.2 Estimated coefficients of factors affecting mental health state of the sub-sample

For subsample analysis, employment status is not part of the explanatory variable since we group the subsample based on employment whether a person work or not work.

The not-working sub sample group.

Based on table 18, 5 regressions for mental health state of not-working people of sub-sample analysis with different sets of explanatory variables, which were used to find out which set of independent variables were appropriated with the data. Using the likelihood-ratio test to calculate to show the explanatory power of additional variables. The standard of a P-value less than 0.05 was employed to discover that the coefficients of the additional variables were statistically significance.

For Ordered Logit Regression of mental health state of sub-sample analysis for a not-working group; Model 1 includes socio-demographic term to show the impact on mental health state, Model 2 adds the community characteristic to see the effect of individually character and living environment on mental health state. Model 3 additionally includes income variable, in term of perception of income. Additional for model 4 included the self-esteem variable. Lastly, Model 5 adds social interaction.

In the end likelihood-ratio test given the results that Model 5 is the most significant model that suit with sub-sample analysis of not-working, due to P-Value that less than 0.05. Which shown that by adding all explanatory variable together will be given the best results, which as Table 18 was given. Estimated coefficient that got from running Model 5 can only provide the direction of explanatory variable.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Based on final model of sub-sample analysis of not-working group, the results were interpreted as follows in column (ii) of *Table 20.*

In the table 20, the results shown that the age was negatively significant for mental health of people who are not-working at the similarly 1% level as full-sample analysis. Including age group between 22 – 39 years old, 40 – 59 years old and the aged above 60, when comparing with the age group between 15 – 21. The result refers as direction of estimated coefficient took place like expected. Meanwhile, being a male was not significant for mental health of those not-working.

Considering to the group of marital status for people who is not-working, married also was significant in positive direction but the level of significantly was changed to 5 % from 1% of the full-analysis. This shown that not-working married people is having a good mental health state, comparing with the single status. For other marital status (i.e. the mostly were separated) was not significant for those who were not working. For education group, gaining an education either getting a bachelor's degree and above or going to school without getting bachelor's degree, lead to positive significantly related to good mental health of people who not-working at the same level as full sample been, comparing with no education group. For being head of a household, it was also negatively significant at the 10% level from 5% of significant full-sample analysis. The new one significance for those not-working was living in urban area, which was positive significantly associated to good mental health of not-working people at the 10% significant level.

Considered the community characteristics, estimate coefficient of the population that living in Central area was negatively significant at the 5 % level and Northeast area was negatively significant at the 1 % level, comparing with those who lived in Bangkok. In addition, by living in the urban area can cause positively significant towards the not working group at the 10% level significant.

For the mechanism of employment, all significant variables still were significant at the similarly level and direction of significant as full sample. Firstly, the perception of income in both sufficient and insufficient, comparing with very sufficient group, lead to negative impact in good metal health state. In addition, in term of self-esteem was having a moderate level onwards positive significantly related to good mental health state, comparing with no self-esteem group and social interact was having a moderate level onwards positive significantly related to good mental health state, comparing no social interaction group.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Table 18 *Estimated coefficient and likelihood-ratio test for sub-sample (not-working) model*

Not-working										
	Model 1: adding socio-demographic variables		***Model 2: adding community characteristic variables***		***Model 3: adding income variables***		***Model 4: adding Self-esteem variables***		***Model 5: adding Social-interaction variables***	
Variables	**Coef.**	**SE**	**Coef.**	**SE**	**Coef.**	**SE**	**Coef.**	**SE**	**Coef.**	**SE**
Age15-21	Reference									
Age2239	-0.48***	0.105	-0.485***	0.105	-0.528***	0.107	-0.557***	0.111	-0.579***	0.112
Age4059	-0.287***	0.092	-0.291***	0.092	-0.377***	0.094	-0.406***	0.098	-0.456***	0.099
Age60above	-0.192**	0.089	-0.199**	0.089	-0.247***	0.091	-0.274***	0.094	-0.349***	0.096
Male	0.036	0.049	0.035	0.049	0.055	0.05	0.054	0.052	0.026	0.053
Singled	Reference									
Married	0.193**	0.08	0.197**	0.08	0.159*	0.082	0.147*	0.085	0.188**	0.086
Widowed	-0.08	0.095	8	0.096	-0.047	0.097	-0.073	0.101	-0.052	0.102
Divorced	-0.422**	0.197	-0.41**	0.197	-0.376*	0.199	-0.32	0.204	-0.275	0.209
Other marital	-0.226	0.161	-0.213	0.161	-0.203	0.162	-0.132	0.167	-0.101	0.169
No education	Reference									
School without bachelor's degree	0.323***	0.084	0.354***	0.084	0.256***	0.085	0.247***	0.088	0.238***	0.089
Bachelor's degree above	0.983***	0.114	1.005***	0.116	0.6***	0.119	0.537***	0.124	0.561***	0.126
Being head of household	-0.117**	0.05	-0.119**	0.05	-0.135***	0.051	-0.09*	0.053	-0.104*	0.053
Bangkok			Reference							
Central			-0.086	0.099	-0.141	0.101	-0.192*	0.106	-0.267**	0.107
North			0.085	0.101	0.111	0.103	0.043	0.107	-0.035	0.109
Northeast			-0.081	0.101	-0.06	0.103	-0.148	0.107	-0.317***	0.109
South			0.045	0.105	0.009	0.107	-0.045	0.112	-0.17	0.113
Urban			0.045	0.043	0.019	0.044	0.044	0.046	0.082*	0.046
Insufficient income					-2.499***	0.138	-2.085***	0.146	-1.866***	0.15
Slightly sufficient					-1.94***	0.126	-1.536***	0.135	-1.351***	0.139
Sufficient					-1.223***	0.126	-0.911***	0.135	-0.83***	0.139
Very sufficient							Reference			
No self-esteem							Reference			

Slight self-esteem							-0.293	0.269	-0.114	0.27
Moderate self-esteem							1.212***	0.255	1.151***	0.256
High self-esteem							2.895***	0.26	2.506***	0.261
No social interaction									Reference	
Slight social interaction									-0.178	0.235
Moderate social interaction									0.707***	0.231
High social interaction									1.819***	0.241
Constant	-2.171	0.102	-2.137	0.14	-4.108	0.189	-2.598	0.32	-2.126	0.381
Constant	0.862	0.099	0.899	0.138	-0.928	0.185	0.889	0.32	1.499	0.382
Chi-square (df)	170.940(11)		185.398(16)		806.857(19)		2068.792(22)		2555.944(25)	
Prob > chi2	0.000		0.000		0.000		0.000		0.000	
LR-test of incremental variables										
	Model 1		**Model 2**		**Model 3**		**Model 4**		**Model 5**	
H_0			Model 1		Model 2		Model3		Model 4	
H_1			Model 2		Model 3		Model 4		Model 5	
F-statistic			14.46**		621.46***		1261.93***		487.15***	
Sample size	9,260		9.260		9,260		9,260		9,260	
*** p-value<.01, ** p-value<.05, * p-value<.1										

The working sub sample group.

Table 19 performed the estimated parameters and likelihood ratio test of each model of ordered logistic regression for deciding to select best model of sub sample analysis on those who working.

In table 19, five regressions for mental health state of working people are included in sub-sample analysis with different sets of explanatory variables, which were used to find out which set of independent variables were suitable with the data. Using the likelihood-ratio test to calculate which to show the explanatory power of additional variables. The standard of a P-value less than 0.05 was employed to discover that the coefficients of the additional variables were statistically significance.

For Ordered Logit Regression of mental health state of sub-sample analysis for working group; Model 1 includes socio-demographic term to show the impact on mental health state, Model 2 adds the community characteristic to see the effect of individually character and living environment on mental health state. Model 3 additionally includes as income variable, in term of perception of income. Additional for model 4 included the self-esteem variable. Lastly, Model 5 as social interaction. Which these sub-sample analysis group are similarly to the not-working sub-sample analysis. By using the sub-sample of 5 model shown that is can provide the best result of explanatory variables for working group analysis.

Based on final model of sub sample analysis of working people, the results were interpreted as follows in column (iii) of *Table 20.*

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

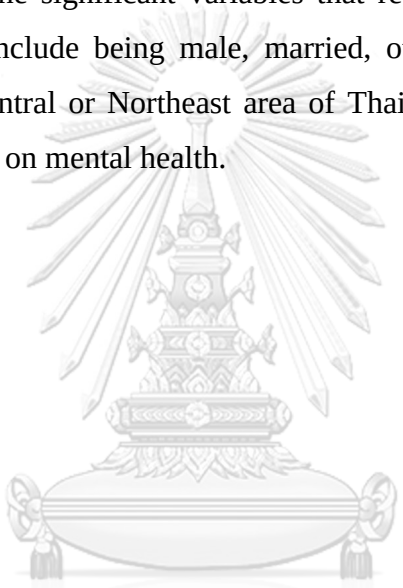
These following are the sociodemographic term in sub-sample analysis of working group. Conversely with not-working group, the age was not significantly related to good mental health of those who working in any age group while being male was positively significant at 1% significant level as the full-sample analysis. For marital status, married still was positively significant for good mental health of people who working, while the other marital status (e.g. separated) was negatively significant at the 5% level. When comparing with the single. Which marital status also significantly like the full-sample analysis. Having an education both gaining a bachelor’s degree or schooling without bachelor’s degree also was positive significantly associated to mental health of those who working at the 1% significant level as the significance of both full-sample and sub sample (not-working) regression.

Being a head of household were not significant for mental health of people who working, which is in contrary with those not-working.

For community characteristics, living in Central and Northeast of Thailand, still were negatively significant at the 1% level. When comparing to those who are living in Bangkok, which are significant with the similar direction of both full-sample analysis and sub-sample of not-working.

The mechanism terms also were significant in the same direction as both of full sample and sub sample (not-working) analysis.

In conclusion, the significant variables that result on good mental health of people who working include being male, married, other marital status, getting an education, living in Central or Northeast area of Thailand, and all mechanisms that employment influenced on mental health.



จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Table 19 *Estimated coefficient and likelihood-ratio test for sub-sample (working) model*

Working										
	Model 1: adding socio-demographic variables		***Model 2: adding community characteristic variables***		***Model 3: adding income variables***		***Model 4: adding Self-esteem variables***		***Model 5: adding Social-interaction variables***	
Variables	**Coef.**	**SE**	**Coef.**	**SE**	**Coef.**	**SE**	**Coef.**	**SE**	**Coef.**	**SE**
Age15-21	Reference									
Age2239	-0.055	0.069	-0.047	0.069	-0.091	0.071	-0.046	0.073	-0.082	0.074
Age4059	0.108	0.068	0.108	0.068	0.026	0.07	0.038	0.073	-0.03	0.074
Age60above	0.146*	0.074	0.152**	0.075	0.101	0.076	0.079	0.079	-0.008	0.081
Male	0.181***	0.029	0.174***	0.029	0.188***	0.03	0.197***	0.031	0.187***	0.032
Singled	Reference									
Married	0.323***	0.043	0.305***	0.043	0.294***	0.044	0.272***	0.046	0.286***	0.046
Widowed	-0.033	0.068	-0.055	0.069	-0.013	0.07	-0.081	0.073	-0.071	0.074
Divorced	-0.02	0.096	-0.046	0.096	0.046	0.098	-0.027	0.102	-0.014	0.103
Other marital	-0.34***	0.085	-0.332***	0.085	-0.25***	0.086	-0.255***	0.089	-0.203**	0.09
No education	Reference									
School without bachelor's degree	0.402***	0.075	0.462***	0.076	0.336***	0.077	0.328***	0.08	0.301***	0.081
Bachelor's degree above	1.077***	0.085	1.141***	0.086	0.676***	0.089	0.735***	0.092	0.705***	0.093
Being head of household	-0.087***	0.03	-0.075**	0.03	-0.098***	0.031	-0.061*	0.032	-0.034	0.033
Bangkok			Reference							
Central			-0.039	0.074	-0.164**	0.076	-0.253***	0.079	-0.335***	0.08
North			0.24***	0.074	0.166**	0.076	0.057	0.08	-0.059	0.081
Northeast			0.119	0.073	0.149**	0.075	-0.031	0.079	-0.207***	0.08
South			0.251***	0.076	0.226***	0.078	0.064	0.082	-0.032	0.083
Urban			0.012	0.027	-0.034	0.028	0.006	0.029	0.035	0.029
Insufficient income					-2.834***	0.109	-2.32***	0.113	-1.985***	0.115
Slightly sufficient					-2.402***	0.074	-1.879***	0.079	-1.646***	0.082
Sufficient					-1.466***	0.072	-1.076***	0.078	-0.932***	0.08

Very sufficient					Reference					
No self-esteem							Reference			
Slight self-esteem							-0.428	0.399	-0.216	0.397
Moderate self-esteem							0.961**	0.395	0.954**	0.394
High self-esteem							2.709***	0.397	2.428***	0.396
No social interaction									Reference	
Slight social interaction									-0.115	0.204
Moderate social interaction									0.745***	0.203
High social interaction									1.855***	0.207
Constant	-1.923	0.1	-1.748	0.122	-4.006	0.144	-2.709	0.421	-2.111	0.458
Constant	1.331	0.099	1.514	0.121	-0.561	0.142	1.029	0.421	1.761	0.459
Chi-square (df)	519.784(11)		598.258(16)		2621.429(19)		5686.595(22)		6797.407(25)	
Prob > chi2	0.000		0.000		0.000		0.000		0.000	
Likelihood-ratio test of incremental variables										
	Model 1		**Model 2**		**Model 3**		**Model 4**		**Model 5**	
H_0			Model 1		Model 2		Model 3		Model 4	
H_1			Model 2		Model 3		Model 4		Model 5	
F-statistic			78.47***		2023.17***		3065.17***		1110.81***	
Sample size	23,710		23,710		23,710		23,710		23,710	
*** p-value<.01, ** p-value<.05, * p-value<.1										

Table 20 Results of ordered logit regression for final model of full and sub sample model

	Full sample (i)		***Sub sample- Not working (ii)***		***Subsample-Working (iii)***	
Variables	**Coef.**	**SE**	**Coef.**	**SE**	**Coef.**	**SE.**
Notworking	-0.161***	0.054				
Agriculture	-0.214***	0.051				
Industry	Reference					
Services	-0.063	0.05				
Age15-21	Reference					
Age2239	-0.321***	0.056	-0.579***	0.112	-0.082	0.074
Age4059	-0.241***	0.055	-0.456***	0.099	-0.03	0.074
Age60above	-0.213***	0.057	-0.349***	0.096	-0.008	0.081
Male	0.157***	0.027	0.026	0.053	0.187***	0.032
Singled	Reference					
Married	0.25***	0.04	0.188**	0.086	0.286***	0.046
Widowed	-0.061	0.057	-0.052	0.102	-0.071	0.074
Divorced	-0.099	0.092	-0.275	0.209	-0.014	0.103
Other marital	-0.212**	0.079	-0.101	0.169	-0.203**	0.09
No education	Reference					
School without bachelor's degree	0.264***	0.06	0.238***	0.089	0.301***	0.081
Bachelor's degree above	0.604***	0.073	0.561***	0.126	0.705***	0.093
Urban	0.022	0.025	0.082*	0.046	0.035	0.029
Bangkok	Reference					
Central	-0.309***	0.064	-0.267**	0.107	-0.335***	0.08
North	0.017	0.065	-0.035	0.109	-0.059	0.081
Northeast	-0.184***	0.065	-0.317***	0.109	-0.207***	0.08
South	-0.038	0.067	-0.17	0.113	-0.032	0.083
Being head of household	-0.055**	0.028	-0.104*	0.053	-0.034	0.033
Insufficient income	-1.964***	0.086	-1.866***	0.15	-1.985***	0.115
Slightly sufficient	-1.551***	0.07	-1.351***	0.139	-1.646***	0.082
Sufficient	-0.899***	0.073	-0.83***	0.139	-0.932***	0.08
Very sufficient	Reference					
No self-esteem	Reference					
Slight self-esteem	-0.061	0.221	-0.114	0.027	-0.216	0.397
Moderate self-esteem	1.142***	0.216	1.151***	0.231	0.954**	0.394
High self-esteem	2.586***	0.218	2.506***	0.036	2.428***	0.396
No social interaction	Reference					
Slight social interaction	-0.125	0.154	-0.178	0.235	-0.115	0.204
Moderate social interaction	0.752***	0.153	0.707***	0.231	0.745***	0.203
High social interaction	1.86***	0.157	1.819***	0.241	1.855***	0.207
Constant	-2.221	0.284	-2.126	0.381	-2.111	0.458
Constant	1.57	0.285	1.499	0.382	1.761	0.459
Chi-square (df)	9383.056(28)		2555.944(25)		6797.407(25)	
Prob > chi2	0.000		0.000		0.000	
Sample size	32,970		9,260		23,710	
*** p-value<.01, ** p-value<.05, * p-value<0.1						

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

6.5.3 Marginal effect of the factors affecting mental health state.

As mentioned before, the estimated coefficient from Ordered Logit Regression could only show the direction of each explanatory variable to the highest category of dependent variable (i.e. good mental health state). But the investigating of magnitude of impact in each outcome category were needed to utilize marginal effect to reveal the magnitudes from each explanatory variable. The interpretation will demonstrate only in statistically significant variables.

Marginal effect of employment status that impact to each categories of mental health state*:*

Based on the marginal effect of each status of employment that get from the full-sample analysis, which referred from Table 21, the resulted are included in three mental health state as follow. Firstly, the marginal effect values of not working that impact the poor mental health state which equals to 0.01, which means that if a person is not-working, then the probability of being poor mental health state will be consisting of 1% higher than working in industry sector. Secondly, the marginal effect values of not working that impact on the normal mental health state equals to 0.02, which meant that if the person is not-working, the probability of being normal is 2% higher than working in industry sector. The last mental health state is good, for the effect values of not working that will impact the good mental health state is equals to - 0.029, which means that the person who is not-working the probability will be 2.9% lower than working in industry sector.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

On the other hand, agriculture sector is the representative of people who are working in the sector of agriculture. They are also maintaining three main results of mental health state as well. Essentially, the marginal effect values in poor mental health state of the agriculture sector is equals to 0.013, the probability is equivalent to 1.3% higher than the not-working state by 0.3%. Furthermore, the marginal effect values in normal mental health state is equal to 0.025, this means that the probability is equals to 2.5% higher than the not-working state.

Finally, for the good mental health state, the marginal value is equal to -0.038, in which the probability will be equals to 3.8%, to compare with the no-

working the result show that its higher than the not-working sector. To conclude this part, the result of both not-working and agriculture are slightly different from each other.

Marginal effect of all explanatory variables (except employment status) on poor mental health state:

The factor that impact poor mental health state for the full sample analysis refers from Table 21 as follow:

The marginal effect of being male was negatively significant at 1% confidence level, if one was man, then he will have a 0.9% lower probability of being poor mental health state than a woman on average. The marginal effect of each age group were 0.019, 0.015, 0.013 consequently and that mean if a person were aged 22-39 or 40-59 or 60 years old above, a person will have a 1.9%, 1.5% and 1.3% higher probability of being poor mental health state than a person who was 15 to 21 years old, which is used as a reference category.

For the marital status, the probability of a married couple will be poor mental health state, which will decrease by 1.5% comparing to a person who is singled. While a person who located in other marital status (e.g. separated), the probability of having poor mental health will increase by 1.3%.

In addition, the educational stage, when a person who went to school without getting a bachelor's degree or got bachelor's degree and above, the probability of being poor mental health state will be reduced by 1.6% and 3.6% subsequently than a person who had not educated.

Moreover, being a head of household had related to being poor mental health state in case that, a person was head of household, the probability of being poor mental health state will be 0.3% higher than those were not.

Furthermore, the living area reveals that if a person lived in Central or Northeastern of Thailand, the probability of having a poor mental health will be 2% and 1% consequently, higher than those who live in a capital (i.e. Bangkok).

In terms of perception of income, for poor mental health category the coefficient of each level of individually income sufficient were 0.118, 0.093 and 0.054, if a person felt that insufficient income or slightly sufficient or sufficient, a

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

person will have a 11.8%, 9.3% and 5.4% subsequently, higher probability of being poor mental health state than person who he/she has very sufficient income.

For self-esteem, if a person felt moderately self-esteem, then a person will have 7% lower probability of having poor mental health than person who felt no self-esteem.

As well as, the probability of a person who gain high level of self-esteem has 16% less probability of having poor mental health comparing to who gain no self-esteem. For social interaction term, from *table 21* showed that having moderately social interaction was related to poor mental health state in a negative manner with the coefficient was -0.045, which means that if a person had moderately social interaction, the probability of being in poor mental health state will be 4.5% lower than a person who had no social interaction. Likewise, if a participant had high level of social interaction, he will have a 11.2% less probability of being poor mental health.

<u>The sub-sample analysis of not-working founded to be different from the full sample analysis as follows,</u>

From Table 22 showed that the Socio-demographic factors are a followed:

For those who were not-working, the coefficient of each age group were 0.042, 0.033, 0.03 subsequently and that mean if a person were aged 22-39 or 40-59 or 60 years old above, a person will have a 4.2%, 3.3% and 3% higher probability of being poor mental health state than a person who was 15 to 21 years old. These numbers show that marginal effect of each age group, in those not-working is higher than marginal effect of full sample analysis.

For the not working being a male is not significant, which mean that being a man is not matter for mental health for those who not working. Marginal effect for marital status, have lower value than those who are not working when comparing to full sample analysis.

If a person married, the probability of being poor mental health state will decline by 1.4% than a person who singled. Moreover, in case of educational stage, when a person goes to school but without bachelor's degree or got bachelor's degree

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

above, the probability of being poor mental health state will decrease by 1.7% and 4.1% subsequently compare to a person who had not educated.

In case of being head of a household of those not-working, the probability to being poor mental health state will be 0.8% higher than those were not. From the marginal effect value of education stage and being head of household can be seen that the effect of getting an education and being head of household for those who not working, which is more than in full-sample analysis.

In term of community characteristics: the living area of those not-working reveal that, if a person lived in Central or Northeastern of Thailand, the probability of having poor mental health will be 2% and 2.3% consequently. Higher than those who lived in Bangkok. Meanwhile, the urban area, the coefficient of living in urban area was -0.006 and living in urban area was significant at 10% confidence level. If a person is not-working lived in urban area, he will have a 0.6% lower probability of being poor mental health than person who lived in rural on average. While, full sample analysis living in urban area is not significant.

Marginal effect of mechanism terms in not working group is slightly more than full-sample analysis. In terms of perception of income, for poor mental health category the coefficient of each level of individually income sufficient were 0.137, 0.099 and 0.061. If a person felt insufficient in his income or slightly sufficient or sufficient, a person will have a 13.7%, 9.9% and 6.1% higher probability of being poor mental health state than person who felt very sufficient income.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

For self-esteem, if a person had moderately self-esteem, then person will have 8% lower probability of having poor mental health than person who had no self-esteem. As the probability of a person who felt high self-esteem which person have 18.4% less probability comparing to who had no self-esteem. For social interaction term, the being moderately social interaction was related to poor mental health state in a negative manner with the coefficient was -0.052, which means if a person had moderately social interaction, the probability of being in poor mental health state will be 5.2% lower than a person who had none social interactive.

Likewise, if a person had high social interaction, he will have a 13.3% less probability of being poor mental health.

From *table 23*, then for the working group, the differences of marginal effect on poor mental health state were found as follow:

Firstly, socio-demographic factors for the sub sample for those working group, all age group are not significant for having a poor mental stage. Which means that the age is irrelevant to the poor mental health stage in a group of working people. Male was negatively significant at a 1% significant level. If a person was man, then he will have a 0.9% lower probability of being poor mental health state than a woman on average.

Whereas the marital status, if a person married, the probability of being poor mental health state will decrease by 1.6% compare to a person who singled, while a person was in other marital status (e.g. separated) the probability of having poor mental health will increase by 1.1%. For educational stage, if a person who got school without bachelor's degree or got bachelor's degree above, the probability of being poor mental health state will be declined by 1.7% or 3.9% than a person who had not education.

Secondly, community characteristics for living area, if a person lived in Central or Northeastern of Thailand, the probability of having poor mental health will be increased by 1.8% and 0.3% compare to those who live in Bangkok. While living in urban area not significant toward having good mental health stage for those who are working.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Thirdly, marginal effect of all mechanism giving less value and slightly different value than not-working and full-sample analysis. For perception of sufficient of income, if a person felt that his income was insufficient or slightly sufficient or sufficient, a person will have a 10.9%, 9% or 5.1% higher probability of being poor mental health state compare to person who felt his income was very sufficient.

Lastly, for self-esteem, if a person had moderate self-esteem, then a person will have 5.2% lower probability of having poor mental health then a person who had no self-esteem. Like the probability of a person who had high self-esteem, which the person will have 13.3% less probability comparing to those who had no self-esteem. For social interaction term, the being moderately social interaction was related to poor mental health state in a negative manner with the coefficient was -0.041, which means if a person had moderately social interaction, the probability of being in poor mental

health state will be 4.1% lower than a person who had none social interaction. Likewise, if a person had high social interaction, he will have 10.2% lower probability of being poor mental health.

Marginal effect of all explanatory variables (except employment status) on normal mental health state:

For full sample analysis shown in Table 21, which shown the factor that impact normal mental health state are as follow:

Being a male was also had doubled the marginal effect on being normal mental health state, when compare to be a male on poor mental health stage. That means he will have a 1.8% lower probability of being normal mental health state than a woman on average. Likewise the coefficient of each age group were increased as twice level from magnitude of being poor mental health state, so a person that aged between 22-39 or 40-59 or above 60 years old, a person will have a 3.7%, 2.8% and 2.5% higher probability of being normal mental health state than a person who was 15 to 21 years old, subsequently.

If a participant married, the probability of being normal mental health state will decline by 2.9% than a person who was singled. The doubling increasing of magnitude was also took place in case of educational stage, when a person who got to school without bachelor's degree or got bachelor's degree and above, the probability of being normal mental health state will be declined by 3.1% and 7% subsequently than a person who are not educated.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Doubling magnitude also took place in the living area variables and term of being head of household, that are, if a person was head of household, the probability to being normal mental health state will be 0.6% higher than those were not. And lived in central or northeastern of Thailand, the probability of having normal mental health will be 3.6% and 2.1% consequently, higher than those who live in the capital (i.e. Bangkok).

In terms of perception of income, if a person felt that insufficient income or slightly sufficient or sufficient, a person will have 23%, 18.1% and 10.5% subsequently, higher probability of being normal mental health state than person who felt very sufficient income.

In case of self-esteem, if a person felt moderate self-esteem, then person will have double magnitude (i.e. 13.3%) lower probability of having normal mental health than person who felt no self-esteem. Also, the doubling probability of a person who felt high self-esteem which that person has 30.1% lower probability comparing to who felt that no self-esteem.

For social interaction term, if a person had moderate social interaction, the probability of being in normal mental health state will be 8.8% lower than a person who had no social interactive. Likewise, if a participant had high social interaction, he will have a 21.7% lower probability of being normal mental health compared to a person who had no social interaction.

From table 22, to consider the sub-sample analysis of not-working, what we found differences from the full sample are:

Firstly, the *socio-demographic factors*, there are the increasing of marginal effect for those who are not working when compare to marginal effect for full sample analysis. Which shown that a person aged between 22-39 or 40-59 or 60 years old above, he will have a 5.8%, 4.6% and 3.5% higher probability of being a normal mental health state compare to a person who was 15 to 21 years old, subsequently. For marital status, if a person married, the probability of being normal mental health state will decline by 1.9% compare to a person who singled. When a person who go to school without bachelor's degree or got bachelor's degree above, the probability of being normal mental health state will be declined by 2.4% and 5.6% subsequently than a person who had no education. And in term of being head of a household, if a person was head of household, the probability to being normal mental health state will be 1.1% higher than those were not. One of the different points from full-sample analysis from being male and being other marital status, which is not significant.

Later, the one main different in term of community characteristics as living in urban is significant for those who not working. Those who lived in urban area will have a 0.8% lower probability of being normal mental health than person who lived in rural on average. As living in Central or Northeastern of Thailand, the probability of having normal mental health will be 2.7% and 3.2%, higher than those who live in

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

capital (i.e. Bangkok). Which the result is less than marginal effect of full-sample analysis.

Next, in term of mechanisms of employment are impacted on the mental health state, marginal effect value of those who not working, with the value got decrease from full-sample analysis. In which the perception of income, if a person felt that insufficient income or slightly sufficient or sufficient, a person will have 18.8%, 13.6% and 8.3%, higher probability of being normal mental health state than person who felt his income was very sufficient.

In case of self-esteem, if a person had moderate self-esteem, then person will have 11.6% lower probability of having normal mental health compare to person who had no self-esteem. Also, the probability of a person who had high self-esteem which person have 25.2% lower probability comparing to who had no self-esteem.

Lastly, for those social interaction term, if a person had moderately social interaction, the probability of being in normal mental health state will be 7.1% lower than a person who had no social interactive. Likewise, if a participant had high social interaction, he will have a 18.3% lower probability of being normal mental health compared to a person who had no social interaction.

In the table 23 it is telling that the marginal effect on normal mental health for the working group, the differences were discovered as below:

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

For the first one, *socio-demographic factors* affect those working in which age and being head of household not matter to having poor mental health state. While the marginal effect of being male, appear to be less than full sample. Which there are males consisting of 2.3% lower probability of being normal mental health state than a woman on average. For marital status, if a person married, the probability of being normal mental health state will decrease by 3.5% than a person who singled. While a person who was in other marital status (e.g. separated) the probability of having poor mental health will increase by 2.5%.

Next, in a case of educational stage, if a person who goes to school without bachelor's degree or got bachelor's degree and above, the probability of being normal mental health state will decrease by 3.7% and 8.7% subsequently, compare to a person who had no education.

Thirdly community characteristics is having one of the different that were not significant of living in urban area compare to those is not working for living region, if a person who working lived in central or northeast of Thailand, the probability of having normal mental health will be increased 4.1% and 2.5% consequently, compare to those who live in Bangkok.

Mechanisms of employment influencing mental health state: in terms of perception of income, if a person who working felt that insufficient income or slightly sufficient or sufficient, a person will have 24.4%, 20.3% and 11.5%, higher probability of being normal mental health state than person who felt his income was very sufficient.

For self-esteem, if a person had moderately self-esteem, then person will have 11.7% lower probability of having normal mental health compare to person who had no self-esteem. Also, the probability of a person who had high self-esteem which person have 30% lower probability comparing to who had no self-esteem.

For social interaction term, if a person had moderately social interaction, the probability of being in normal mental health state will be 9.2% lower than a person who had no social interactive. Which contain value more than not working estimate to be 2%. Likewise, if a person had high social interaction, he will have a 22.8% lower probability of having normal mental health compared to a person who had no social interaction.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Marginal effect of all explanatory variables (except employment status) on good mental health state:

Refers to table 21, for full sample analysis, which the factor that impact on good mental health state show how much the marginal effect. Notably, as the result shown that all explanatory variables have inverse the direction of marginal effect from the direction on poor and normal mental health state as follow.

For the socio-demographic factors, those who were 60 years old or above were 3.8%, less likely to be in a good mental health state. Male was 2.8% more likely to have a good mental health compare to female. Those who married was 4.4% more likely to being in a good mental health state compare to those who were singled. While those who had other marital status (i.e. mostly of them were separated) was

3.7% less likely to being in a good mental health state. And those who was head of a household was 1% less likely to be in good mental health state compare to who were not a head of a household. Those who had educated in school without bachelor's degree was 4.7% more likely to being in a good mental health and those who had bachelor's degree or above was 10.7% also more likely to having good mental health compare to those who had not educated.

Whereas the community characteristics factor, those who lived in Central or Northeast of Thailand were 5.5% or 3.3 % less likely to being in good mental health state compare to those who live in Bangkok.

For the channels in which employment may impact mental health, those who had perception of their income was sufficient, were 1.59% less likely to having good mental health state compare to those who felt their income were very sufficient.

In case of self-esteem, those who had high level of self-esteem were 45.7% more likely to being in good mental health state compare to those had no self-esteem. Likewise, those who had moderate self-esteem were 20.1% more likely to having good mental health. And those who had moderate social interaction or high level of social interaction the probability of being in good mental health state will be 13.3% and 33% higher than a person who had no social interaction

From the table 22 is it shown that when to do the sub-sample analysis of not-working, what is found differences from the full sample.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Essentially, the socio-demographic factors are maintaining of those who were 60 years old or above were 6.1% less likely to being in a good mental health state. Which got the double probability comparing with probability of full sample. Those who married was 3.3% more likely to being in a good mental health state compare to those who were singled. And those who was head of a household was 1.8 % less likely to good mental health state compare to were not. Those who had educated in school without bachelor's degree was 4.1% more likely to being in good mental health and those who had bachelor's degree or above was 10% also more likely to having good mental health compare to those who had not educated. On the other hand, being male not significant those who not working.

Next is the Community characteristics: those who lived in Central or Northeast of Thailand were 4.6% or 5.5 % less likely to being in good mental health state compare to those who live in Bangkok. Also, the one main different from full sample analysis that it the significant of living in urban area. For those who lived in urban area were 1.4% less likely to being good mental health than person who lived in rural.

For Mechanisms term the marginal effect is not too different from full-sample analysis.

For those who had perception of their income was sufficient, were 14.4% less likely to having good mental health state compare to those who felt their income were very sufficient. In case of self-esteem, those who had high self-esteem were 44% more likely to being in good mental health state compare to those had no self-esteem. Likewise, those who had moderate self-esteem were 20% more likely to having good mental health.

And those who had moderate social interaction or extremely social interaction the probability of being in good mental health state will be 12.3% and 31.6% higher than a person who had no social interactive.

For marginal effect value on good mental health state of those who are working, the difference from not-working group and full-sample are shown in table 23, in the detailed as follow:

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

In term of the socio-demographic factors, the age not relevant to those working and working male was 3.3% more likely to be in good mental health state compare to female. Those who married was 5.1% more likely to being in good mental health state compare to those who were singled. Those who had other marital status (i.e. most of them were separated) was 3.6% less likely to being in good mental health state. Those who had educated in school but without bachelor's degree was 5.4% more likely to being in good mental health and those who had bachelor's degree or above was 12.6% more likely to having good mental health compare to those who had not educated.

Next, the Community characteristics affect those who lived in Central or Northeast of Thailand were 6% or 3.7 % less likely to being in good mental health

state compare to those who live in Bangkok. While, living in urban not relevant to those who are working.

Lastly, Mechanisms of employment influencing mental health state, the marginal affect value not different too much upon full-sample analysis and not working people. For those who had perception of their income was sufficient, were 16.6% less likely to having good mental health state compare to those who felt their income were very sufficient. In case of self-esteem, those who had high self-esteem were 43.2% more likely to be in a good mental health state compare to those had no self-esteem.

Likewise, those who had moderate self-esteem were 17% more likely to having good mental health. And those who had moderately social interaction or high social interaction the probability of being in good mental health state will be 13.3% and 33% higher than a person who had no social interaction.

In descending order of the marginal effect of each explanatory variable on being good mental health for those working, it was found that having high self-esteem was the greatest contributing factor (43.2%) followed by the feeling of insufficient income (35.3%) and having extremely social interaction (33%). All three mechanisms seem like able to improve the mental health state of people who working.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Table 21 Marginal effects of mental health state in full sample

	Poor mental health state		***Normal mental health state***		***Good mental health state***	
Variables	**ME**	**SE**	**ME**	**SE**	**ME**	**SE**
Notworking	0.01***	0.003	0.02***	0.006	-0.029***	0.009
Agriculture	0.013***	0.003	0.025***	0.006	-0.038***	0.009
Industry	Reference					
Services	0.004	0.009	0.007	0.006	-0.011	0.009
Age15-21	Reference					
Age22-39	0.019***	0.003	0.037***	0.007	-0.057***	0.01
Age40-59	0.015***	0.003	0.028***	0.007	-0.043***	0.01
Age60above	0.013***	0.003	0.025***	0.007	-0.038***	0.01
Male	-0.009***	0.002	-0.018***	0.003	0.028***	0.005
Single	Reference					
Married	-0.015***	0.002	-0.029***	0.005	0.044***	0.007
Widowed	0.004	0.003	0.007	0.007	-0.011	0.01
Divorced	0.006	0.006	0.012	0.011	-0.018	0.016
Other marital	0.013***	0.005	0.025***	0.009	-0.037***	0.014
No education	Reference					
School w/o bachelor's degree	-0.016***	0.004	-0.031***	0.007	0.047***	0.011
Bachelor's degree above	-0.036***	0.004	-0.07***	0.009	0.107***	0.013
Urban	-0.001	0.002	-0.003	0.003	0.004	0.004
Bangkok	Reference					
Central	0.02***	0.004	0.036***	0.007	-0.055***	0.011
North	0.001	0.004	0.002	0.008	-0.003	0.012
Northeast	0.01***	0.004	0.021***	0.008	-0.033***	0.011
South	0.002	0.004	0.004	0.008	-0.007	0.012
Head of household	0.003**	0.002	0.006**	0.003	-0.01**	0.005
Insufficient income	0.118***	0.005	0.23***	0.01	-0.347***	0.015
Slightly sufficient	0.093***	0.005	0.181***	0.008	-0.274***	0.012
Sufficient income	0.054***	0.004	0.105***	0.008	-0.159***	0.012
Very sufficient	Reference					
No self-esteem	Reference					
Slight self-esteem	0.004	0.013	0.007	0.026	-0.159	0.039
Moderate self-esteem	-0.07***	0.013	-0.133***	0.025	0.201***	0.038
High self-esteem	-0.16***	0.013	-0.301***	0.026	0.457***	0.038
No social interaction	Reference					
Slight social interaction	0.01	0.009	0.014	0.018	-0.022	0.027
Moderatesocial interaction	-0.045***	0.009	-0.088***	0.018	0.133***	0.027
High social interaction	-0.112***	0.01	-0.217***	0.018	0.33***	0.028
Sample size	32,970					
***p-value<.01, ** p-value<.05, * p-value<0.1						

Table 22 Marginal effects of mental health state in sub-sample (not-working)

Not-working						
	Poor mental health state		***Normal mental health state***		***Good mental health state***	
Variables	**ME**	**SE**	**ME**	**SE**	**ME**	**SE**
Age15-21	Reference					
Age22-39	0.042***	0.008	0.058***	0.011	-0.1***	0.02
Age40-59	0.033***	0.007	0.046***	0.01	-0.08***	0.02
Age60above	0.03***	0.007	0.035***	0.01	-0.061***	0.02
Male	-0.002	0.004	-0.003	0.005	0.005	0.009
Single	Reference					
Married	-0.014**	0.006	-0.019**	0.009	0.033**	0.015
Widowed	0.004	0.007	0.005	0.01	-0.009	0.018
Divorced	0.02	0.015	0.028	0.021	-0.048	0.036
Other marital	0.007	0.012	0.01	0.017	-0.018	0.029
No education	Reference					
School w/o bachelor's degree	-0.017***	0.007	-0.024***	0.009	0.041***	0.015
Bachelor's degree above	-0.041***	0.009	-0.056***	0.013	0.1***	0.022
Urban	-0.006*	0.003	-0.008*	0.005	0.014*	0.008
Bangkok	Reference					
Central	0.02**	0.008	0.027**	0.011	-0.046**	0.02
North	0.003	0.008	0.004	0.011	-0.006	0.02
Northeast	0.023***	0.008	0.032***	0.011	-0.055***	0.02
South	0.012	0.008	0.017	0.011	-0.029	0.02
Head of household	0.008*	0.004	0.011*	0.005	-0.018*	0.009
Insufficient income	0.137***	0.012	0.188***	0.015	-0.324***	0.026
Slightly sufficient	0.099***	0.011	0.136***	0.014	-0.235***	0.024
Sufficient income	0.061***	0.01	0.083***	0.014	-0.144***	0.024
Very sufficient	Reference					
No self-esteem	Reference					
Slight self-esteem	0.008	0.02	0.011	0.027	-0.02	0.047
Moderate self-esteem	-0.08***	0.02	-0.116***	0.026	0.2***	0.044
High self-esteem	-0.184***	0.02	-0.252***	0.027	0.44***	0.045
No social interaction	Reference					
Slight social interaction	0.013	0.017	0.018	0.024	-0.031	0.041
Moderate social interaction	-0.052***	0.017	-0.071***	0.023	0.123***	0.04
High social interaction	-0.133***	0.018	-0.183***	0.024	0.316***	0.042
Sample size	9,260					
*** p-value<.01, ** p-value<.05, * p-value<0.1						

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Table 23 Marginal effect of mental health state in sub-sample (working)

Working						
	Poor mental health state		***Normal mental health state***		***Good mental health state***	
Variables	**ME**	**SE**	**ME**	**SE**	**ME**	**SE**
Age15-21	Reference					
Age22-39	0.004	0.004	0.01	0.009	-0.15	0.013
Age40-59	0.002	0.004	0.004	0.009	-0.005	0.013
Age60above	0.0004	0.004	0.001	0.01	-0.001	0.014
Male	-0.01***	0.002	-0.023***	0.004	0.033***	0.006
Single	Reference					
Married	-0.016***	0.003	-0.035***	0.006	0.051***	0.008
Widowed	0.004	0.004	0.009	0.009	-0.013	0.013
Divorced	0.001	0.006	0.002	0.013	-0.002	0.018
Other marital	0.011**	0.005	0.025**	0.011	-0.036**	0.016
No education	Reference					
School w/o bachelor's degree	-0.017***	0.004	-0.037***	0.01	0.054***	0.014
Bachelor's degree above	-0.039***	0.005	-0.087***	0.011	0.126***	0.017
Urban	-0.002	0.002	-0.004	0.004	0.006	0.005
Bangkok	Reference					
Central	0.018***	0.004	0.041***	0.01	-0.06***	0.014
North	0.003	0.004	0.007	0.01	-0.011	0.014
Northeast	0.011**	0.004	0.025***	0.01	-0.037**	0.014
South	0.002	0.005	0.004	0.01	-0.006	0.015
Head of household	0.002	0.002	0.004	0.004	-0.006	0.006
Insufficient income	0.109***	0.007	0.244***	0.014	-0.353***	0.02
Slightly sufficient	0.09***	0.005	0.203***	0.01	-0.293***	0.014
Sufficient income	0.051***	0.005	0.115***	0.01	-0.166***	0.014
Very sufficient	Reference					
No self-esteem	Reference					
Slight self-esteem	0.012	0.022	0.027	0.05	-0.038	0.071
Moderate self-esteem	-0.052**	0.022	-0.117**	0.05	0.17**	0.07
High self-esteem	-0.133***	0.022	-0.3***	0.05	0.432***	0.07
No social interaction	Reference					
Slight social interaction	0.006	0.011	0.014	0.025	-0.02	0.036
Moderate social interaction	-0.041***	0.011	-0.092***	0.025	0.133***	0.036
High social interaction	-0.102***	0.012	-0.228***	0.026	0.33***	0.037
Sample size	23,710					
*** p-value<.01, ** p-value<.05, * p-value<0.1						

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

6.6 Exploring mechanisms that link working status and mental health

In this part, the researcher has analyzed mechanisms that employment may impact on mental health state by using an ordered logistic model for analyzing the impact of each employment status on each mechanism. The purpose of this analysis is to see how employment status impacts the mechanism and to find out which mechanism plays the role of influencing employment on the mental health state.

The reason for using an ordered logistic model is because the variable of mechanisms that the researcher needs to analyze has a character of an ordinal variable that reflects the degree of those mechanisms.

This model below is used for the analyzing:

$$\begin{aligned} Mechanism^{*} = {} & \beta_0 + \beta_1 Notworking + \beta_2 Agri + \beta_3 Service + \beta_4 Age2239 + \beta_5 Age4059 \\ & + \beta_6 Age60above + \beta_7 Male + \beta_8 Married + \beta_9 Widowed + \beta_{10} Divorced \\ & + \beta_{11} Othermari + \beta_{12} Schwithodeg + \beta_{13} Bachelorabove + \beta_{14} Headhouse \\ & + \beta_{15} Central + \beta_{16} North + \beta_{17} Northeast + \beta_{18} South + \beta_{19} Urban + \varepsilon_i \end{aligned}$$

Mechanism* is a latent index which assume to have linear function with parameters and is a function of many observed explanatory variables as well as the error term, ε. This part observes mechanisms

From the result of the estimated coefficient in Table 24 show that.

In terms of the perception of income, people who are a part of not working have shown the result of a strongly negative effect on perception of income compared with the industrial sector. Meaning that for the not working people it could deteriorate the feeling that their income is very sufficient compared to those who work in the industrial sector.

Likewise, working in the agricultural sector also appears to have a strongly significant impact on the perception of income in a negative direction. By this, the result also meant that people who are working in the agricultural sector could likely have a feeling of insufficient income compared to people who work in the industrial sector.

Oppositely, working in a service sector found the result of positively significant related to a perception of income compared to the industrial sector. This statement

explains that people who work in a service sector tend to have an increased perception with their income sufficiency. Therefore, with the significance and the direction that we found from perceived income, it might be reasonable to be the mechanism that employment could improve the mental health state. The difference of perceived income for each employment status is the channel that impacts on mental health state.

Follow by the next mechanism, which is self-esteem results for not-working appears to be positively significant with strongly statistically significant at the level of 0.01 compared to the industry sector. Which means that the people who are not-working tend to have higher self-esteem than the industrial sector. Therefore, if the not-working people have higher self-esteem, this means that self-esteem is not the channel that employment could increase the mental health state.

Similarly, the result for agriculture is positively significant towards self-esteem compared to the industrial sector, also that means those who work in the agricultural sector are likely to have higher self-esteem than the people who work in the industrial sector. Referring to the finding of the mental health state, working in the agricultural sector likely to deteriorate mental health state. The contradict result shows that, in this case self-esteem seems not be the channel that improves the mental health state. In the case of the service sector, the estimated coefficient shows the insignificant result in self-esteem.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

For the last mechanism is social interaction, it is shown for the not-working to be positively significant at the level of 0.05 on social interaction. This result means that people who are not-working seem to have a higher social interaction than the industrial sector. According to this, if the not-working people have higher social interaction than those who are working, this means that social interaction cannot be the channel that can cause employment to increase their mental health state.

Likewise, agriculture employed results had a strongly positive significance at a statistical level of 0.01. This means that people who work in the agricultural sector tend to have a higher social interaction compared to those who are in the industrial sector. Implying to the results of mental health state, that working in the agricultural

sector expected to have lower mental health state. By these results it is also shown that social interaction does not seem to be the channel that improves the mental health state. Due to the expectation and the results are contradicted.

In conclusion, the researcher found that the only mechanism that has a reasonable result toward employment affects mental health state which is through the perception of income. The other two channels (i.e. self-esteem and social interaction), provide unexpected results, which shows that people who are not-working tend to have better self-esteem and social interaction than those who are working. This means that those two channels are not the precise channels that cause the worsen mental health of the not-working people.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Table 24 Estimated coefficient of mechanisms

	Perception of income		**Self -esteem**		**Social interaction**	
Variables	**Coef.**	**SE**	**Coef.**	**SE**	**Coef.**	**SE**
Notworking	-0.643***	0.048	0.171***	0.057	0.11**	0.053
Agriculture	-0.191***	0.046	0.18***	0.055	0.282***	0.051
Industry	Reference					
Services	0.113**	0.045	0.068	0.054	0.126**	0.05
Age15-21						
Age2239	0.153***	0.051	-0.178***	0.059	0.006	0.056
Age4059	0.335***	0.05	0.004	0.058	0.237***	0.055
Age60above	0.273***	0.053	0.045	0.06	0.318***	0.057
Male	-0.018	0.025	0.032	0.028	0.072***	0.027
Singled	Reference					
Married	0.165***	0.037	0.162***	0.043	0.008	0.04
Widowed	-0.153***	0.051	0.092	0.06	-0.053	0.056
Divorced	-0.348***	0.083	0.061	0.096	-0.188**	0.091
Other marital	-0.238***	0.071	-0.177**	0.086	-0.328***	0.078
No education	Reference					
School without bachelor's degree	0.498***	0.054	0.225***	0.064	0.28***	0.06
Bachelor's degree above	1.674***	0.067	0.574***	0.076	0.688***	0.072
Being head of household	0.035	0.025	-0.126***	0.029	-0.105***	0.028
Bangkok	Reference					
Central	0.307***	0.059	0.239***	0.07	0.513***	0.062
North	0.273***	0.059	0.32***	0.071	0.658***	0.063
Northeast	-0.047	0.059	0.402***	0.071	0.871***	0.063
South	0.208***	0.061	0.423***	0.073	0.629***	0.065
Urban	0.0638***	0.023	-0.061**	0.026	-0.108***	0.025
Constant	-1.989	0.098	-5.013	0.147	-3.915	0.124
Constant	0.854	0.096	-1.977	0.114	-0.38	0.104
Constant	4.094	0.1	2.121	0.114	3.138	0.106
Chi-square (df)	2755.065(19)		269.458(19)		654.311(19)	
Prob > chi2	0.000		0.000		0.000	
Sample size	32,970		32970		32970	
*** p-value<.01, ** p-value<.05, * p-value<.1						

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

6.7 Conclusion of full-sample and sub-sample analysis results

Table 25 reveals the conclusion of the results of the three regressions above. The sign represented the direction of the impact on the dependent variable (i.e. good mental health state). The blank spot means that there was insignificant association between dependent variables and that explanatory variable.

1. In terms of employment status, being not working and working in agricultural sector had negatively significant relationship with being good mental health state, and the signs of both coefficients were similarly sign as expected. For working in service sector, had no significant relationship in any mental health state. According to these empirical results in term of employment status, the first hypothesis (i.e. the mental health of the people not-working is worse than the mental health of the people who work in industrial sector) and second hypothesis (i.e. the mental health of those who worked in agricultural sector is worse than mental health of industry sector employed people) were both seem to match with the results.
2. For the socio-demographic variables in both of full-sample analysis and sub-sample analysis. These factors include married, getting an education either schooling without bachelor's degree or having bachelor's degree and onwards, these can affect a good mental health state significantly. Either married or receiving any level of educations can have the positive affect on having good mental health state. For the empirical result of educational stage on mental health, it corresponds to the 4th hypothesis that people with higher education should have better mental health than those with lower education.
3. Considering community characteristics in both full-sample analysis and sub-sample analysis, living in Central or Northeastern of Thailand both are having significantly negative relationships upon good mental health state
4. For the mechanism variables in both full-sample analysis and sub sample analysis, those mechanisms include income, self-esteem and having social interaction. These variables are all significant result towards good mental health state. Those who has perception of slightly sufficient and sufficient income tend to have a negative relationship towards good mental health

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

state when comparing with group of those who are having a perception of income that are very sufficient. While both self-esteem and social interaction are having a significant positive relationship towards a good mental health state, in term of those who maintain with a moderate and a high level of both self-esteem and social interaction. The empirical results of perceived income were matched to 5th hypothesis that higher perception of income is related to better mental health.

5. For the sub-sample analysis of not-working people, the socio-demographic variable involving good mental health state including the variables of being male and having other marital status (i.e. the majority of this marital status group is separated). Which being a male can give a result of positive towards good mental health state, meanwhile by having other marital status can lead to a result of negative towards a good mental health state.
   The empirical result of male wasn't match with the 3rd hypothesis, that dedicate with the mental health of male is worse than the mental health of female. It might occur from the reason, in which context in Thailand male are more freely to act upon social value and culture on the other hand women still stuck in the conserved principles.
6. For sub-sample analysis of not-working people, the community characteristics variables which have a significant relationship upon statistics towards a good mental health state only variables that living in urban area. Which appears as a positive result as good mental health state. Meanwhile, it is not consisting of community characteristics variables that could lead to the mental health of a working group.
7. For the sub-sample analysis of working people, the factors that we find significance are being elder (i.e. aged 60 or above) and being head of household. In which of being either elderly or being head of household can have a significant negative effect towards a good mental health state.
8. For all analyses, the factors that we find insignificant are widowed, divorced, living in southern and living in northern of Thailand.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Table 25 Conclusion of results

Variables	**Full sample**	**Sub sample- Not working**	**Sub sample-Working**
Notworking	-		
Agriculture	-		
Services			
Age2239	-	-	
Age4059	-	-	
Age60above	-	-	
Male	+		+
Married	+	+	+
Widowed			
Divorced			
Other marital	-		-
Schooling without bachelor's degree	+	+	+
Bachelor's degree above	+	+	+
Being head of household	-	-	
Central	-	-	-
North			
Northeast	-	-	-
South			
Urban		+	
Insufficient income	-	-	-
Slightly sufficient	-	-	-
Sufficient	-	-	-
Slight self-esteem			
Moderate self-esteem	+	+	+
High self-esteem	+	+	+
Slight social interaction			
Moderate social interaction	+	+	+
High social interaction	+	+	+

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

CHAPTER 7

CONCLUSION & RECOMMENDATIONS

7.1 Conclusion

Since there are a lot of empirical studies reveal that unemployment impacts mental health of the people, but to assess the impact of different employment sector on mental health is also one of the interesting aspects to investigate. This research attempts to investigate the relationship between mental health and employment status in Thailand. Data that used for estimation came from the 2014 edition of survey on conditions of society, culture and mental health (Thai happiness). Utilizing ordered logistic regression models based of different regression specifications, including full sample analysis which to see the impact on mental health state from difference employment sector and sub sample analysis, to see which socio-demographic factors or community characteristics that could affect the mental health state of those who are working and those are not working.

For the full sample analysis, the results reveal that employment status had an impact on mental health state of Thai people. Those working in an agricultural sector were less likely to have good mental health state than those who worked in industrial sector, one possible explanation is that working in agricultural have the problem of instability of job duration and fluctuated income. The empirical result also finds that mental health state of people who are not-working have less tendency to adopt good mental health state as compared to those who worked in industry jobs. The main reasons were explained in the existing studies which reveals that since work can provide a chance to develop new skills that can be the part of their identity. Indeed, those new skills can lead to the multi-tasking of an individual, this can lead to more self-esteem (Trunk, Heffner and Kramer, 2011). Another possible explanation, the aspect of social interaction which could improve mental health of those who are working because the feeling to be part of a society is the basic need of humans and working is a one way to becoming accepted (Honey, 2004). The findings of relationship between mental health state and employment status in this study, were

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

consistent with the studies in Brazil (Bernarda et al., 2003) and in Australia (Milner et al., 2014), respectively.

In case of socio-demographic factors; gender, age, educational attainment, marital status and being head of household were significantly related to mental health state of Thai people.

Firstly, for age group, this group had a strongly negative significance impact on having good mental health state relative to age 15 to 21 group. Moreover, the age could be impact on mental health state, especially when those people who were not-working. By this, the study finds larger impact of age on mental health among those not-working. This finding, especially the elder age group had negative impact on mental health state, was similar with the study in Spain (Torre et al., 2018).

Secondly, upon gender group was positive impact of having male on being good mental health state, that means being female lead to worse mental health state, specifically among those working sample. This discovering is consistent with Honkonen et al. (2007) in Finland.

Thirdly, for educational attainment, being educated without bachelor's degree, with bachelor's degree or above, are significantly positive effect on having good mental health state, for full sample as well as for working and not working samples.

Fourthly, marriage could increase the probability of having good mental health state, while the other marital status (i.e. the majority of this status were separated) could decrease the probability to having a good mental health, especially if individuals were working.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Lastly, for being a head of household, it has negatively significance effect on having a good mental health state, while there was not significance of this variable among those working sample. There were differences of mental health state across the community characteristics. As people living in central and northeastern region, they were less likely for being in a good mental health state than those living in Bangkok, whether they work or not. For the type of living area, living in urban area had positive significantly impact on having good mental health state only for people who were not-working.

In terms of mechanisms, from the part of exploring mechanisms/channels which employment impacts on the mental state. The only mechanism that has rational outcomes is the perception of income, which the result of exploring mechanisms is consistent with the result of mental health. These other two channels (i.e. self-esteem and social interaction), the results were not corresponding onwards to mental health, so self-esteem and social interaction were not the exact mechanisms.

The perception of income could decrease the level of mental health state if they felt that their income was not very adequate. In term of self-esteem, having moderate self-esteem could improve the level of mental health state, as well as those who had high self-esteem were more likely to have a good mental health than those having no self-esteem. For the social interaction, the most or moderate social interaction had the strong positive effect on having good mental health state, in which probable explanation was the social supporting (the one of social interaction) could help people deal with unfavorable situation better than isolated dealing (Honey, 2004). All three mechanisms could impact on mental health state among full sample as well as for subsample whether they were working or not.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

7.2 Recommendations

Based on the finding of this study, the policy recommendations are proposed in order to improve the mental health state of Thai people following the significant variables found in this research.

First of all, mental health has a leading impact on a person's standard of living, cost to individual and society. This study shows that the type of employment could have an affect on the mental health state of Thai people. As a result, it shows that people who were not working had a significant negative relationship of being in good mental health. The support from the government should be provided to these not-working. The examples of not-working are the students, unemployed or elderly that were retired. In the case of students, the study has already been proven that education plays a part of improving people's mental health. Therefore, education should be covered throughout Thailand Education systems by providing an accessible education. In Thailand, the free schooling policy which aims to provide free education to students for 15 years (i.e. schooling until high school level or Vocational Certificate) has already been implemented. For the suggestion, compulsory education should still be maintained and emphasize more on the educational improvement in terms of the quality.

Secondly, in Thailand, agriculture is one of the major sectors and has a significant negative relationship towards having good mental health. To improve their mental health state, the government needs to solve the problem of instability of income and encouragement on agricultural activities. There are various kinds of welfare such as revenue assurance and Crop Insurance. This revenue assurance helps to stabilize the product's price and make sure that the product is under the market price. However, this revenue assurance welfare is effective in a certain field but not the whole sector. Another existing policy is the “Crop Insurance”, this policy covers the damage cost from disaster in terms of agriculture productions. Since there are too many conditions set by the government, both of them still do not cover the whole sector. Meanwhile, the government should not limit the type of crops or productions so that those policies can be easily accessible by those agriculturers and helpful concerning their instability of income and improvement on agriculture activities.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Thirdly, the study found that aging had a strong negative significance of having a good mental health state, corresponding to the current situation of aging society. “Which the mental health problem of the elderly was possibly from the income issue that could increase stress in terms of financial hardship” (Goldberstein, 2015). The adequate income for elderly could slightly improve mental health on the feeling of not being a burden from their family. In Thailand, the age ranking of those elders who will get the allowance is between 60 and above at the rate of THB600 and increases THB100 every 10 years. To compare with Hong Kong, elderly residents aged 70 or above gain HK$ 1,435 (i.e. around THB6,000) per month per person. Even though the cost of living index between Thailand and Hong Kong is just approximately two times different. (Asia Current Cost of Living Index, 2020) The government should reconsider the increase of allowance so that those elders can have an improved standard of living and a better mental health state.

The fourth recommendation is dealing with the issue of gender inequality in Thailand. Being female had a negative significance of having a good mental health state, while being men had a positive impact on having a good mental health. The implication of this result showed that inequality of gender still exists in Thailand. To improve mental health state of women, the government needs to make an effort to solve the problem of gender inequality in the aspect of gender bias (i.e. the preference or prejudice toward one gender over the others) or gender discrimination. For instance, the policy should support organization, base on the “Zero Tolerance Policy” which is the policy that allows the organization to accept the employee and treat them without any gender discrimination. In addition, “Pay Equity” and positioning the position should not be based on gender bias but should be based on their work performances. These are the policies that support those in the working sectors. On the other hand, those public policies should be more practical on the punishment about sexual harassment case. According to the current situation, there is a gap in the law, which is the actual legal code in the end does not affect the offender. Which will disturb the mental health state of the victim or female, in terms of fear and anxiety.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Last, due to this study reveals that there were impacts of perceived income on the mental health state of people on both those working and those not-working. The possible explanation is that both were facing the increasing cost of living which could lead to the worrying about insufficient income and it could become one factor that leads to mental health deterioration. The government needs to deal with the problems such as the price rising, minimum wage or other costs related to cost of living in Thailand.

This study assesses the effect of employment status, socio-demographic factors and community characteristics on the mental health state of Thai people. The future studies need to be conducted to expand the understanding on the impact of each employment status, which uses other criteria for grouping type of employment, on mental health state. In other aspects of mental health (e.g. mental illness, mental disorder), further studies should be conducted to investigate the impact of employment or unemployment on the mental health issue. The studies also need to examine the other mechanisms that employment could affect mental health in Thailand.

7.3 Limitations

There remain some limitations of this research, as follows:

1) Dataset:

   First, social context changes annually, while the latest dataset which author could utilized is from 2014 wave. The results would be better representative if data was utilized from more contemporary. Furthermore, if there are another dataset that could classify further on the employment situation (e.g. unemployment, duration of finding the job), the result could be even more useful.

   Secondly, the inability to distinguish between individuals not in the labor force and those unemployed was from the lack of questions about unemployment on this survey, therefore the actual unemployed were not included into the analysis.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

2) Mechanisms variables was the strong variables that affect mental health state, while the questions that represented the variables in this questionnaire, can partially capture each of mechanism variables. It would be more beneficial to find more variables that can strongly represent these mechanisms.
3) Actual income may be better perceived income in investigating the impact of income on personal mental health state according to existing literature. Nonetheless, the question in this survey was only asking the term people about the perception in their income.
4) Limitation of model,

   First, for the mental health state of full sample analysis, by doing variance inflation factor (VIF) analysis, From the list of explanatory variables that we included in the model, we find the variance inflation factor, overall value is 10.51 which is greater than 10. Therefore, there is evidence showing slightly of multicollinearity problem (i.e. if VIF value >10 there was multicollinearity). Therefore, further studies need to investigate more into this problem.

   Second, there might be some endogeneity problems, the problem occurs when explanatory variables have some correlation with the error term of the model. In this case, employment status can affect mental health state but on the other hand, mental health state might also lead to affect the working performance or applying for a job. Due to this problem, the estimated coefficient might be biased therefore, the claiming of the causal relationship might not be accurate. Since, this paper does not cover this problem, further studies need to concern more about the instrumental variable method (IV). The instrumental variable should be the variable that correlates to the employment but have no relationship with the error term of the model (i.e. no direct impact on mental health state)

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

REFERENCES

Apichai, M., Tavee, T., & Pichet, U. (2005). The development and testing of a new Thai Mental Health Indicator (TMHI). *J Psychiatr Assoc Thailand, 50*, 71-91.

Baumeister, R. F., Campbell, J. D., Krueger, J. I., & Vohs, K. D. (2003). Does high self-esteem cause better performance, interpersonal success, happiness, or healthier lifestyles? *Psychological science in the public interest, 4*(1), 1-44.

Bertera, E. M. (2005). Mental health in US adults: The role of positive social support and social negativity in personal relationships. *Journal of social and personal relationships, 22*(1), 33-48.

Bishop, P., & Gripaios, P. (2010). Spatial externalities, relatedness and sector employment growth in Great Britain. *Regional Studies, 44*(4), 443-454.

Bolton, W., & Oatley, K. (1987). A longitudinal study of social support and depression in unemployed men. *Psychological medicine, 17*(2), 453-460.

Chaiprasit, K., & Santidhiraku, O. (2011). Happiness at work of employees in small and medium-sized enterprises, Thailand. *Procedia-Social and Behavioral Sciences, 25*, 189-200.

Chuang, H. L., Hsieh, N., & Lin, E. S. (2010). Labour market activity of foreign spouses in Taiwan: Employment status and choice of employment sector. *Pacific Economic Review, 15*(4), 505-531.

Corcoran, P., & Arensman, E. (2011). Suicide and employment status during Ireland's Celtic Tiger economy. *European journal of public health, 21*(2), 209-214.

Dooley, D., Prause, J., & Ham-Rowbottom, K. A. (2000). Underemployment and depression: longitudinal relationships. *Journal of Health and Social Behavior*, 421-436.

Edwards, B., Gray, M., & Hunter, B. (2015). The impact of drought on mental health in rural and regional Australia. *Social Indicators Research, 121*(1), 177-194.

Flatau, P., Galea, J., & Petridis, R. (2000). Mental health and wellbeing and unemployment. *Australian Economic Review, 33*(2), 161-181.

Ford, E., Clark, C., McManus, S., Harris, J., Jenkins, R., Bebbington, P., . . . Stansfeld, S. (2010). Common mental disorders, unemployment and welfare benefits in England. *Public health, 124*(12), 675-681.

Galderisi, S., Heinz, A., Kastrup, M., Beezhold, J., & Sartorius, N. (2015). Toward a new definition of mental health. *World Psychiatry, 14*(2), 231.

Golberstein, E. (2015). The effects of income on mental health: evidence from the social security notch. *The journal of mental health policy and economics, 18*(1), 27.

Goldsmith, A. H., Veum, J. R., & Darity Jr, W. (1997). Unemployment, joblessness, psychological well-being and self-esteem: Theory and evidence. *The Journal of Socio-Economics, 26*(2), 133-158.

Gouttebarge, V., Aoki, H., Verhagen, E., & Kerkhoffs, G. (2016). Are level of education and employment related to symptoms of common mental disorders in current and retired professional footballers? *Asian journal of sports medicine, 7*(2).

Greene, C. B. (2011). *The impact of employment on severe and persistent mental illness: A community mental health study of self-esteem and symptomatology.* Capella University,

Harnois, G., Gabriel, P., & Organization, W. H. (2000). Mental health and work:

Impact, issues and good practices.
Henriksen, I. O., Ranøyen, I., Indredavik, M. S., & Stenseng, F. (2017). The role of self-esteem in the development of psychiatric problems: a three-year prospective study in a clinical sample of adolescents. *Child and adolescent psychiatry and mental health, 11*(1), 68.
Honey, A. (2004). Benefits and drawbacks of employment: Perspectives of people with mental illness. *Qualitative health research, 14*(3), 381-395.
Honkonen, T., Virtanen, M., Ahola, K., Kivimäki, M., Pirkola, S., Isometsä, E., . . . Lönnqvist, J. (2007). Employment status, mental disorders and service use in the working age population. *Scandinavian journal of work, environment & health*, 29-36.
Khan, M., Mahmood, H. Z., Akhtar, S., & Muhmood, K. (2014). Understanding employment situation of women: A district level analysis. *International Journal of Gender and Women's Studies, 2*, 168-169.
Kronenberg, C., Jacobs, R., & Zucchelli, E. (2017). The impact of the UK National Minimum Wage on mental health. *SSM-population health, 3*, 749-755.
Lindsay, S. (2011). Employment status and work characteristics among adolescents with disabilities. *Disability and rehabilitation, 33*(10), 843-854.
Ludermir, A. B., & Lewis, G. (2003). Informal work and common mental disorders. *Social psychiatry and psychiatric epidemiology, 38*(9), 485-489.
Ludermir, A. B., & Lewis, G. (2005). Is there a gender difference on the association between informal work and common mental disorders? *Social psychiatry and psychiatric epidemiology, 40*(8), 622-627.
McMillan, K. A., Enns, M. W., Asmundson, G., & Sareen, J. (2010). The association between income and distress, mental disorders, and suicidal ideation and attempts: findings from the Collaborative Psychiatric Epidemiology Surveys. *The Journal of clinical psychiatry, 71*(9), 1168-1175.
Meyer, S. R., Decker, M. R., Tol, W. A., Abshir, N., Mar, A. A., & Robinson, W. C. (2016). Workplace and security stressors and mental health among migrant workers on the Thailand–Myanmar border. *Social psychiatry and psychiatric epidemiology, 51*(5), 713-723.
Milner, A., LaMontagne, A., Aitken, Z., Bentley, R., & Kavanagh, A. M. (2014). Employment status and mental health among persons with and without a disability: evidence from an Australian cohort study. *J Epidemiol Community Health, 68*(11), 1064-1071.
Mongkol, A., Tangseree, T., Udomratn, P., Huttapanom, W., & Chuta, W. (2007). *The development of Thai Mental Health Indicator (TMHI): from past to present.* Paper presented at the The 3rd international conference on gross national happiness towards global transformation.
Neubert, M., Süssenbach, P., Rief, W., & Euteneuer, F. (2019). Unemployment and mental health in the German population: the role of subjective social status. *Psychology research and behavior management, 12*, 557.
Numbeo. (2020). Asia: Cost of Living Index by City 2020 Mid Year. Retrieved from https://www.numbeo.com/cost-of-living/region_rankings.jsp?title=2020-mid&region=142
Ono, E., Nozawa, T., Ogata, T., Motohashi, M., Higo, N., Kobayashi, T., . . . Miyake, Y. (2011). *Relationship between social interaction and mental health.* Paper

presented at the 2011 IEEE/SICE International Symposium on System Integration (SII).

Organization, I. L. (1993). Resolution concerning the International Classification of Status in Employment (ICSE), adopted by the Fifteenth International Conference of Labour Statisticians (January 1993).

Organization, W. H. Mental health: strengthening our response. 2018 Mar 30. In.

Organization, W. H. (2004). *Prevention of mental disorders: Effective interventions and policy options: Summary report*: World Health Organization.

Organization, W. H. (2005). *Promoting mental health: concepts, emerging evidence, practice: a report of the World Health Organization, Department of Mental Health and Substance Abuse in collaboration with the Victorian Health Promotion Foundation and the University of Melbourne*: World Health Organization.

Organization, W. H. (2013). Mental health action plan 2013-2020.

Organization, W. H. (2017). *Depression and other common mental disorders: global health estimates*. Retrieved from

Pernice, R., Trlin, A., Henderson, A., North, N., & Skinner, M. (2009). Employment status, duration of residence and mental health among skilled migrants to New Zealand: results of a longitudinal study. *International Journal of Social Psychiatry, 55*(3), 272-287.

Perreault, M., Touré, E. H., Perreault, N., & Caron, J. (2017). Employment status and mental health: Mediating roles of social support and coping strategies. *Psychiatric Quarterly, 88*(3), 501-514.

Puangsorn, P., & Buathong, N. (2017). Mental health and defense mechanism among flight attendants in a commercial airline in Thailand. *Chulalongkorn Medical Journal, 61*(6), 799-813.

Ritchie, H., & Roser, M. (2020). Mental health. 2020. In.

Rosenthal, L., Carroll-Scott, A., Earnshaw, V. A., Santilli, A., & Ickovics, J. R. (2012). The importance of full-time work for urban adults' mental and physical health. *Social science & medicine, 75*(9), 1692-1696.

Taylor, R., Page, A., Morrell, S., Carter, G., & Harrison, J. (2004). Socio-economic differentials in mental disorders and suicide attempts in Australia. *The British Journal of Psychiatry, 185*(6), 486-493.

Yiengprugsawan, V., Somboonsook, B., Seubsman, S.-a., & Sleigh, A. C. (2012). Happiness, mental health, and socio-demographic associations among a national cohort of Thai adults. *Journal of Happiness Studies, 13*(6), 1019-1029.

Yur'yev, A., Värnik, A., Värnik, P., Sisask, M., & Leppik, L. (2012). Employment status influences suicide mortality in Europe. *International Journal of Social Psychiatry, 58*(1), 62-68.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

VITA

NAME	Patchara Suwannasin
DATE OF BIRTH	10 July 1995
PLACE OF BIRTH	Songkhla, Thailand
INSTITUTIONS ATTENDED	Faculty of Economics, Kasetsart University
HOME ADDRESS	181/44 Chatthong Gardenville 3, Pawong, Mueang Songkhla, Songkhla 90100

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University