

## CHAPTER 5

### DISCUSSION AND CONCLUSION

In this study, a cross-sectional deductive research by telephone interviewing followed the questionnaire guideline survey was employed to study the relationship between calories burnt by exercise, compliance, eating behavior score, Type 2 diabetes knowledge, BMI, demographic data namely—age and gender,—and Fasting Blood Glucose, for 200 patients who came to Saraburi Hospital for Type 2 diabetes during the period of January 15, 2008 to March 15, 2008.

The objective of this study was 1. To compare the means of Fasting Blood Glucose, compliance, diabetes knowledge, age, calories burnt by exercise, BMI and eating behavior score between gender 2. To find correlations between BMI, age, calories burnt by exercise, diabetes knowledge, eating behavior score, compliance, and Fasting Blood Glucose and 3. To find Hierarchical Stepwise Multiple Regression Analysis Model to predict Fasting Blood Glucose.

The data were discussed and presented into three sections according to the research questions as the followings:-

When controlling for drug:

1. Did Type 2 diabetes patients male and female have different calories burnt by exercise, compliance score, eating behavior score, diabetes knowledge, age, BMI and Fasting Blood Glucose?

2. Could (calories burnt by exercise, compliance score, eating behavior score, diabetes knowledge, BMI and age) individually predict Fasting Blood Glucose in Type 2 diabetes patients? In other words were there any significant correlation between (calories burnt by exercise, compliance score, eating behavior score, diabetes knowledge, BMI and age) and Fasting Blood Glucose?

3. What factors significantly predicted Fasting Blood Glucose in Type 2 diabetes patients?

Conclusion, recommendation, qualifications of this study and future study were also provided.

Our study found that most of Type 2 diabetes patients were female. The data was similar to the study of Sornpuang (1998)<sup>(82)</sup> and Moolasarn (2005)<sup>(83)</sup>. The patients averages age were  $59.34 \pm 11.99$  years old. Most of patients were married. The largest subgroup at a particular level of educational attainment had completed grade school and the most of patients were officer.

### **5.1 Assessment of research question**

This study examined the relationship between BMI, age, calories burnt by exercise, diabetes knowledge, eating behavior score, compliance score and Fasting Blood Glucose. Our study posed three fundamental inquiries (when controlling for drug “Metformin”).

#### 5.1.1 The first question

The first question asked “Did Type 2 diabetes patients male and female have different calories burnt by exercise, compliance score, eating behavior score, diabetes knowledge, age, BMI and Fasting Blood Glucose?”. Our study found that Fasting Blood Glucose, compliance score, diabetes knowledge, age, BMI, and eating behavior score between male and female were not significantly different ( $p > 0.05$ ) but calories burnt by exercise between male and female were significantly different ( $p < 0.05$ ). In other words, male exercised more than female. The result was similar to the study of Santiparp (2003)<sup>(83)</sup>.

#### 5.1.2 The second question

The second question asked “Could (BMI, age, calories burnt by exercise, compliance score, diabetes knowledge and eating behavior score) individually predict Fasting Blood Glucose in Type 2 diabetes patients? In other words were there any significant correlation between (BMI, age, calories burnt by exercise, compliance score, diabetes knowledge and eating behavior score) and Fasting Blood Glucose?” The study

found that there were all seven independent variables in this model, The diabetes knowledge score had significant negative largest correlation with Fasting Blood Glucose ( $r = -0.42^{**}$ ,  $p < 0.01$ ). Calories burnt by exercise and age had significant negative correlation with Fasting Blood Glucose as well ( $r = -0.24^{**}$ , and  $r = -0.14^*$ ,  $p < 0.01$ , and  $p < 0.05$ , respectively). It meant that the more patients had diabetes knowledge, the more they exercised and the older they were the less Fasting Blood Glucose they got.

### 5.1.3 The third question

The third question asked “What factors significantly predicted Fasting Blood Glucose in Type 2 diabetes patients?” The study found that gender ( $p < 0.01$ ), age ( $p < 0.05$ ), calories burnt by exercise ( $p < 0.01$ ), diabetes knowledge ( $p < 0.01$ ) score and BMI ( $p < 0.05$ ) were the significant predictors of Fasting Blood Glucose in the equation with R Square = 0.26. Surprisingly, compliance and eating behavior were not significantly predictors of the model.

In our study, compliance score and eating behavior score were not significant predictors of Fasting Blood Glucose while most studies confirmed that they did. The possible explanations of this phenomenon were: Firstly was because of the question of validity and reliability of the 2 scales. After perusing and examining the 2 scales carefully, Cronbach’s Alpha coefficient of Sorofman’s Compliance scale for constructs “right time” and “right amount” were 0.8157, and 0.8526 respectively and Auamnoy Eating Behavior Scale was 0.7915. These indicated the internal consistency of the 2 scales were obviously beyond the shadow of doubt. Therefore, researcher believed in the second possible explanation “the white coat incident”. Secondly “The white coat incident” was patients always answered compliance questions according to satisfy physicians or researchers even when the patients didn’t comply to it well. This phenomenon could skew the results of this study and caused independent variables (compliance score and eating behavior score) were not significant predictors.

The  $R^2$  (coefficient of determination) was the total percent variance of dependent variable (Fasting Blood Glucose) could be explained by all seven dependent variables namely: Male, BMI, age, calories burnt by exercise, compliance score, diabetes knowledge and eating behavior score or how good the seven predictors were? with the

value range from 0 to 1. The higher  $R^2$  value indicated a better of explanatory power of the model resulted in greater prediction of the dependent variables. Nevertheless, the  $R^2$  of this study had low value (0.26), possible explanations were: Firstly, researcher could control and could be responsible only for one part (the researcher's part) of the whole study. Still many other parts came from physicians, laboratory technician, pharmacists and also patients. Our statistical calculations were under assumption that all collected data were true. However if they were not true these uncontrollable factors would confound the study and/or caused specification errors. It was beyond the scope of this study to control all of these uncontrollable factors.

## **5.2 Conclusion and recommendation**

Our study found that when controlling for drug "Metformin", Type 2 diabetes patients Fasting Blood Glucose could be significantly predicted by 1. Diabetes knowledge—meaning the more knowledge patients had the less Fasting Blood Glucose they got ( $p < 0.01$ ), 2. The quantity of calories burnt by exercise—meaning the more they exercise the less Fasting Blood Glucose they got ( $p < 0.05$ ). However, age had inversely correlation to Fasting Blood Glucose—meaning, the older the patients were the lower Fasting Blood Glucose they got. 3. Gender was a significant factor to predict Fasting Blood Glucose. We found that male Type 2 diabetes patients had significantly higher Fasting Blood Glucose than female ( $p < 0.01$ ), BMI was a significant factor to predict Fasting Blood Glucose. We found that patients had more BMI the less Fasting Blood Glucose they got ( $p < 0.01$ ). Surprisingly, compliance score and eating behavior were not significantly predictors of the model.

In summary, diabetes knowledge, calories burnt by exercise and gender were three significantly most influence factors for predicting Fasting Blood Glucose. The diabetes patients should be educated how to cope with diabetes and do the more exercise.

## **5.3 Qualification of this study**

The study contained many limitations. And so to address these limitations properly, we have as well suggest some research directions so to get a better understanding in the future, as the followings:-

### 5.3.1 Qualification of controlling other drugs confounder

In this study we controlled only one drug “Metformin” which was prescribed at the first visit when the patient was diagnosed as Type 2 diabetes. We were not interested in the other drugs which physicians prescribed along with Metformin. This would be major potential confounders to the study.

### 5.3.2 Qualification of the compliance scale

Regarding questions in medical regimen compliance scale; patient might not clearly understand all questions that interviewer asked, the scale needed more content validity to well specify compliance. Moreover, researchers required more capable evidence based technique to identify medical regimen compliance for example “pill count”.

### 5.3.3 Qualification of the eating behavior scale

Nonetheless, The Auamnoy Eating Behavior Visual Analog Scale version 3 was improved from The Auamnoy Eating Behavior Ordinal Scale version 2. Still there were rooms to revise. Even though Cronbach’s Alpha coefficient of The Auamnoy Eating Behavior Visual Analog Scale was 0.7915, for a better solution in the future this scale necessitated adjustment.

### 5.3.4 Qualification of the statistical analysis

This research could be improved by using One Way ANCOVA statistics (for hypotheses 1-7) controlling for (baseline) fasting blood sugar—pretest before treatment with drugs—and age of patients as the two covariates and blocking design by drug. It would yield more reliable and precise results when get rid of these confounders. For hypotheses 8-13, future research design would minimize error form extraneous variables namely—age, Fasting Blood Glucose before treatment (baseline) by applying partial correlation instead of simple correlation liked this research. We certainly believed

that the more powerful statistical techniques were employed the more accurate and reliable outcomes we would achieve unconditionally.

#### **5.4 Future study**

Future study should be done in more Type 2 diabetes patients in different hospitals in Thailand with more accurately question by adding more valid constructs and proper indicators in the questionnaire to increase scale reliability. Moreover, the other anti-diabetic drug groups and generic names must be controlled. This would yield a better precise result and could be generalized findings to all Thai diabetes patients as a whole.