KNOWLEDGE, ATTITUDES AND PRACTICES REGARDING DIABETES MELLITUS AMONG MYANMAR MIGRANT WORKERS IN BANG KHUN THIAN DISTRICT, BANGKOK, THAILAND

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ความรู้ ทัศนคติ การปฏิบัติต่อโรคเบาหวานในแรงงานอพยพชาวพม่าในเขตบางขุนเทียน กรุงเทพมหานคร ประเทศไทย

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เนียน วิน : ความรู้ ทัศนคติ การปฏิบัติต่อโรคเบาหวานในแรงงานอพยพชาวพม่าในเขตบางขุนเทียน กรุงเทพมหานคร ประเทศไทย (KNOWLEDGE, ATTITUDES AND PRACTICES REGARDING DIABETES MELLITUS AMONG MYANMAR MIGRANT WORKERS IN BANG KHUN THIAN DISTRICT, BANGKOK, THAILAND) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: ปีเตอร์ ซีนอล, 103 หน้า.

การศึกษาภาคตัดขวางในเขตบางขุนเทียน กรุงเทพมหานคร ประเทศไทย การศึกษานี้ดำเนินขึ้นเมื่อเดือนพฤษภาคม และเดือนมิถุนายน พุทธศักราช 2558 โดยมีวัตถุประสงค์เพื่อประเมินความรู้ ทัศนคติ และการปฏิบัติตนต่อโรคเบาหวานในแรงงานอพยพชาวพม่าที่อาศัยอยู่ในเขตบางขุนเทียน จำนวน 437 คน (เพศชาย 286 คน และเพศหญิง 151 คน) โดยการสัมภาษณ์จากผู้ให้คำตอบโดยตรง เครื่องมือที่ใช้ในการศึกษา คือ แบบสอบถาม การศึกษานี้ได้รับการอนุมัติทางจริยธรรมให้ดำเนินการศึกษาเมื่อวันที่ 28 พฤษภาคม พุทธศักราช 2558 (หมายเลข 089.1/58) แบบสอบถามประกอบไปด้วยหัวข้อต่างๆ ดังนี้ คือ ลักษณะทางประชากรและการตระหนักรู้ ปัจจัยเสี่ยง ความรู้ ทัศนคติ และการปฏิบัติตนต่อโรคเบาหวาน สถิติที่ใช้ในการศึกษาคือ ไคส์สแควร์ (Chi square) การวิเคราะห์การถดถอยเชิงเส้น (Linear regression) และสมการถดถอยแบบ Logistic regression ผลการศึกษาพบว่า แรงงานส่วนใหญ่มีความรู้ต่อโรคเบาหวานระดับดี และมีทัศนคติด้านบวกอยู่ในระดับกลาง ส่วนคะแนนด้านการปฏิบัติตนมีความผันแปร พบว่าผู้ชายมีระดับความรู้ดีด้านการปฏิบัติตนมากว่าผู้หญิง การตระหนักรู้และระยะเวลาการอาศัยในประเทศไทยมีความสัมพันธ์กัน (p=0.02) อายุมีความความสัมพันธ์ต่อการตระหนักรู้โรคเบาหวานในหญิงตั้งครรภ์(p=0.002) มีความสัมพันธ์เชิงบวกระหว่างประวัติครอบครัวและระยะเวลาการอาศัยในประเทศไทย (p=0.043) เพศชายมีความสัมพันธ์เชิงบวกกับการสูบบุหรี่ (p<0.001) ระยะเวลาการอาศัยในประเทศไทยมีความสัมพันธ์กับการสุบบุหรี่ (p<0.001) อายุมีความสัมพันธ์กับความดันโลหิตสูง (p< 0.001) อายุมีความสัมพันธ์กับดัชนีมวลกาย (BMI) และกลุ่มตัวอย่างที่มีอายุ 44 ปีขึ้นไปมีแนวโน้มที่มีดัชนีมวลกายมากกว่ากลุ่มที่มีอายุต่ำกว่า 31 ปี (p=0.046) สถานภาพการสมรสมีความสัมพันธ์กับดัชนีมวลกาย (BMI) และกลุ่มตัวอย่างที่สมรสแล้วมีแนวโน้มที่มีดัชนีมวลกาย (BMI) มากกว่ากลุ่มสถานภาพโสด (p=0.031) เมื่อเปรียบเทียบด้านกลุ่มชาติพันธุ์พบว่ากลุ่มฉาน (Shan) มีดัชนีมวลกาย (BMI) มากกว่ากลุ่มพม่า (Burmese) (p=0.005) และกลุ่มชาติพันธุ์อื่น ๆ มีแนวโน้มที่จะมีค่าดัชนีมวลกายน้อยกว่าเมื่อเทียบกับพม่า (Burmese) (p = 0.04) ผู้ตอบแบบสอบถามที่ไม่มีใบอนุญาตทำงานมีความสัมพันธ์เชิงลบกับความรู้ ทัศนคติ และการปฏิบัติตน p-value <0.001, 0.017 และ <0.001 ตามลำดับ เพศชายมีความสัมพันธ์เชิงลบต่อระดับความรู้ (p = 0.027) ผู้ตอบแบบสอบถามที่มีการศึกษาระดับมัธยมมีความรู้มากกว่าผู้ที่ไม่เรียนหนังสือ (p = 0.038) กลุ่มชาติพันธุ์ยะไข่ (Rakhine) มีความสัมพันธ์เชิงบวกกับความรู้ (p = 0.026) ผู้ตอบแบบสอบถามที่มีระดับการศึกษาในมหาวิทยาลัยมีความสัมพันธ์ที่ดีกับระดับทัศนคติ (p = 0.032) เพศชายมีความสัมพันธ์เชิงบวกกับต่อการปฏิบัติตนเมื่อเทียบกับเพศหญิง (p = 0.001) กลุ่มชาติพันธุ์ยะไข่มีความสัมพันธ์ที่ดีต่อการปฏิบัติตน (p = 0.023) มีความสัมพันธ์ระหว่างความรู้และทัศนคติ ความรู้และการปฏิบัติตน หากแต่ไม่มีความสัมพันธ์ระหว่างทัศนคติและระดับปฏิบัติตน การศึกษานี้เป็นข้อมูลพื้นฐานลักษณะทางประชากรในแรงงานอพยพชาวพม่าที่อาศัยอยู่ในเขตบางขุนเทียน แม้ว่าผลการศึกษาจะมีคะแนนในระดับดีในด้านความรู้ ทัศนคติ แต่ผลคะแนนการปฏิบัติตนมีความผันแปรตามเพศ การให้ความรู้ด้านสุขศึกษาที่มีประสิทธิภาพจะเป็นมาตรการต่อการปฏิบัติตนที่ดีต่อสุขภาพและการปรับเปลี่ยนวิถีการดำเนินชีวิตบนพื้นฐานของความรู้และทัศนคติซึ่งเป็นสิ่งจำเป็น การศึกษาการประมาณของโรคเบาหวานในกลุ่มอพยพชาวพม่าจึงเป็นเรื่องที่ควรศึกษา

คำสำคัญ ความรู้ ทัศนคติ และการปฏิบัติตน โรคเบาหวาน กลุ่มผู้ใช้แรงงานชาวพม่า

สาขาวิชา สาธารณสุขศาสตร์ ลายมือชื่อนิสิต .....

ปีการศึกษา 2557 ลายมือชื่อ อ.ที่ปรึกษาหลัก .....

5778813953 : MAJOR PUBLIC HEALTH
KEYWORDS: KNOWLEDGE / ATTITUDES / PRACTICES / DIABETES MELLITUS / MYANMAR MIGRANT WORKERS

NYAN WIN: KNOWLEDGE, ATTITUDES AND PRACTICES REGARDING DIABETES MELLITUS AMONG MYANMAR MIGRANT WORKERS IN BANG KHUN THIAN DISTRICT, BANGKOK, THAILAND. ADVISOR: PETER XENOS, Ph.D., 103 pp.

A cross sectional study was done in Bang Khun Thain district, Bangkok, Thailand in May and June, 2015. The main purpose of this study was to assess knowledge, attitudes and practices regarding diabetes mellitus among Myanmar migrant workers living in Bang Khun Thain district of Bangkok metropolitan area. The study was done on 437 subjects (286 men and 151 women). Face to face interview was carried out by using structured interviewer administered questionnaires. The ethical approval was given on 25 May, 2015 with protocol No. 089.1/58. Questionnaires regarding socio-demographic characteristics and awareness, risk factors, knowledge, attitudes and practices regarding diabetes mellitus were assessed. Chi square test, linear regression and logistic regression were used for statistical analyses.

Most of the respondents got good knowledge scores and moderately positive attitude scores. The results of the practice score varied: most of the male respondents got good level of practice scores whereas the female respondents got poor level of practice scores. There is an association between awareness of diabetes mellitus and duration of living in Thailand ($p=0.02$). Age is found to be associated with awareness of gestational diabetes ($p=0.002$). There is a positive association between family history of diabetes mellitus and duration of living in Thailand ($p=0.043$). Males have positive association with smoking status ($p<0.001$). Duration of living in Thailand is also associated with smoking status ($p<0.001$). Age is found to be associated with the presence of hypertension ($p< 0.001$). Age is associated with BMI and people who are 44 years of age and above tend to have more BMI than people who are under 31 years of age ($p=0.046$). Marital status also has association with BMI and married respondents tend to have more BMI than singles ($p=0.031$). Shan ethnic group has more BMI compared to Burmese ($p=0.005$) and the ethnic group which is labelled as other tends to have less BMI compared to Burmese ($p=0.04$). Respondents who don't have work permit have negative association with knowledge, attitude and practice with p-value of <0.001, 0.017 and <0.001 respectively. Males have negative association with knowledge level ($p=0.027$). Respondents who have middle school level of education have more knowledge compared to those who never attended the school ($p=0.038$). Rakhine ethnic group has positive association with knowledge ($p=0.026$). Respondents who have University level of education have positive association with attitude level ($p=0.032$). Males have positive association with practice compared to females ($p=0.001$). Rakhine ethnic group has positive association with practice level ($p=0.023$). There are associations between knowledge and attitude, and knowledge and practice. But there are no association between attitude and practice level.

The study provides baseline socio-demographic characteristics of Myanmar migrant workers in Bang Khun Thian district. Estimation of knowledge, attitudes and practices could be done among the study population. Although the respondents got good knowledge and attitude scores, the practice scores vary between genders. Effective health education for healthy practice measures and lifestyle modification based on knowledge and attitudes is needed. Further study for estimation of diabetes mellitus among the migrants should be done.

Field of Study: Public Health Student's Signature .....

Academic Year: 2014 Advisor's Signature .....

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LIST OF ABBREVIATIONS

WHO –World Health Organization

IDF-International Diabetes Federation

DM-Diabetes mellitus

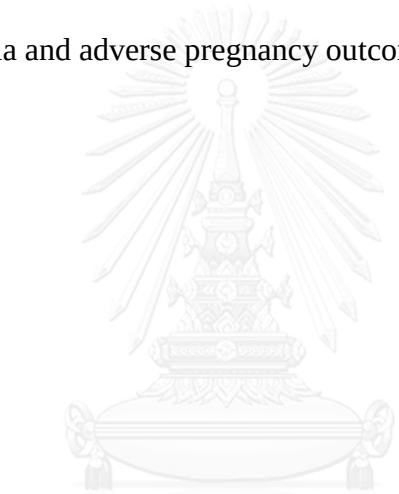
IOM-International Organization for Migration

RBS-Random blood sugar

FBS-Fasting blood sugar

BMI-Body mass index

HAPO-Hyperglycemia and adverse pregnancy outcome



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CHAPTER I
INTRODUCTION

1.1 Background

There is the huge impact of chronic non-communicable diseases nowadays due to lifestyle changes and environmental factors. Prevalence of such diseases are common not only in developed countries but also in developing countries where the prevalence of infectious diseases is still high. Chronic diseases have to be cured in long term, affect the economic activity of people and cause impairment of the quality of life because of their lifelong morbidities. Diabetes mellitus is a chronic metabolic disease that affects the population of the whole world. As of 2013 data 347 million people get diabetes (International Diabetes Federation). As of WHO in 2012, 1.5 million deaths were caused by diabetes. And diabetes mellitus will be the seventh leading cause of death in 2030 according the projection of WHO.

Diabetes is a chronic disease caused either by absent or inadequate production of the hormone, insulin by the gland, pancreas or defect of the body to adequately utilize the produced insulin called insulin resistance. It has been recognized since 1500 BC. Diabetes became a clinical entity in 1812. Canadian doctor Frederick Banting discovered the hormone insulin in 1921 which is the definitive treatment of type 1 diabetes and in some cases of type 2 diabetes. Pathogenesis of diabetes mellitus is not known clearly. It is caused by the multiple factors. (WHO)

The prevalence of diabetes in people above 18 years of age is estimated to be 9 % in 2014 and more than 80% of diabetes related deaths are from low and middle income countries (WHO). In developing countries, the rate of diabetes prevalence is rapidly increasing. In 2025, two of the three diabetes patients will be from developing nations and one in three would be from China or India. Drastic changes of socio-demographic characteristics and unbalanced distribution of those benefits in developing countries would cause increased prevalence of double burden of communicable and non-communicable diseases. (Narayan et al., 2011)

There is also the high prevalence of diabetes mellitus in Western Pacific region which includes Southeast Asian countries according to the classification of International Diabetic Federation.

Although health education and facilities of health services are progressing by time, most of the people are still unaware of the risk factors, pathogenesis, treatment options, lifestyle modifications and regular monitoring of diabetes mellitus. Awareness of the nature of this disease might reduce the prevalence of disease and its consequent morbidities and mortalities. (Narayan et al., 2011)

The prevalence of diabetes mellitus is increasing in developing world. According to international diabetic federation, the prevalence of diabetes in Thailand is about 9% and that in Myanmar is about 6%. The trend of prevalence is increasingly common around 40 to 60 years of age in developing countries.

By the UN definition, a migrant worker means a person who is engaged or has been engaged in a remunerated activity in a State of which he or she is not a national. According to 2014 data, number of registered Myanmar migrant workers excluding dependent persons in Thailand is 623648(IOM). Bang Khun Thian is one of the districts of Bangkok metropolitan area. It has two sub-districts. According to 2011 data, there are about 7000 Myanmar migrant workers in that district.

The purpose of this study is to assess the knowledge, attitudes and practices of the Myanmar migrant workers in Bang Khun Thian district, Bangkok, Thailand regarding prevention, treatment, controlling and monitoring of diabetes mellitus.

As there is still high range of influx of migrants from Myanmar to Thailand due to economic instability in Myanmar, the health issue of those workers have been considered as one of the top priorities of public health sector. There are just few studies that are related to diabetes mellitus among Myanmar migrant workers.

1.2 Research Questions

1. What are the knowledge, attitudes and practices regarding diabetes mellitus among Myanmar migrant workers in Bang Khun Thian district, Bangkok, Thailand?
2. What are the associations of socio-demographic characteristics and awareness level of diabetes mellitus, socio-demographic characteristics and presence of the risk factors of diabetes mellitus, socio-demographic characteristics and knowledge, attitudes and

practices regarding diabetes mellitus among Myanmar migrant workers in Bang Khun Thian district, Bangkok, Thailand?

1.3 Research Objectives

1.3.1 General Objective

To study the knowledge, attitudes and practices regarding diabetes mellitus among Myanmar migrant workers in Bang Khun Thian district, Bangkok, Thailand.

1.3.2 Specific Objectives

1. To evaluate the knowledge, attitudes and practices, awareness level and risk factors related to diabetes mellitus among Myanmar migrant workers in Bang Khun Thian district, Bangkok, Thailand.

2. To describe the socio-demographic characteristics and their relations to awareness, risk factors, knowledge, attitudes and practices regarding diabetes mellitus and to describe the associations between risk factors and knowledge, attitudes and practices regarding diabetes mellitus.

1.4 Research Hypothesis

There are associations between socio-demographic characteristics and risk factors, socio-demographic characteristics and awareness, socio-demographic characteristics and knowledge, attitudes and practices, risk factors and knowledge, attitudes and practices regarding diabetes mellitus among Myanmar migrant workers in Bang Khun Thian district, Bangkok, Thailand.

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1.5 Conceptual framework

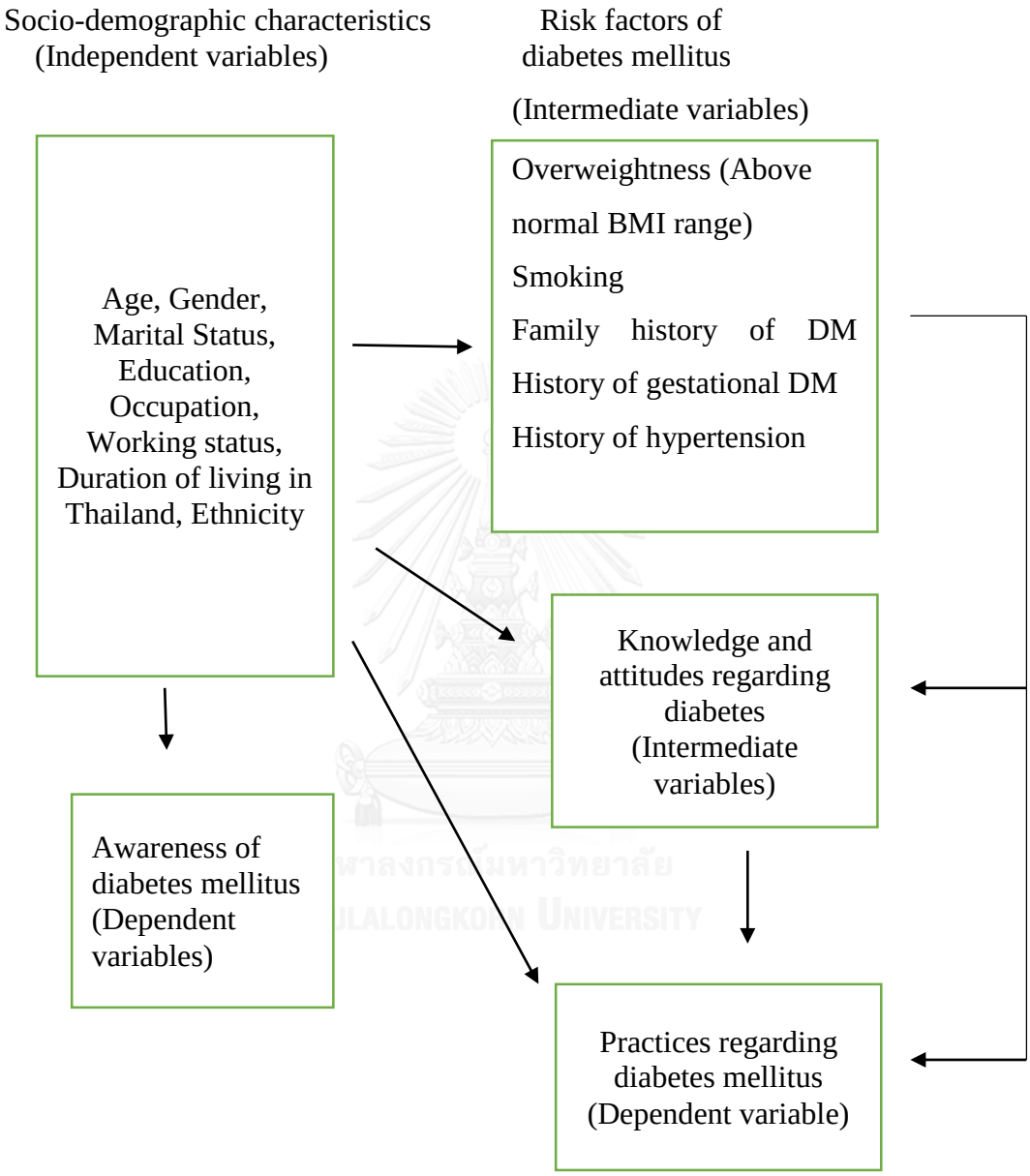

Figure 1: Conceptual framework

1.6 Operational Definitions

Age refers to the last completed birthday at the time of interview.

Residence is the area that the study population lives.

Occupation refers to the working status of the participants.

Education refers to the highest attained level of education.

Marital status refers to current marital status of the respondents.

Diabetes mellitus refers to the fasting plasma glucose level ≥7mmol/L (126mg/dl) or 2 hour plasma glucose level ≥11.1mmol/L (200mg/dl). (WHO)

BMI means body mass index. According to WHO criteria, the normal BMI ranges from 18.5 to 24.9 kg/m2. BMI above 24.9 kg/m2 is defined as overweight and above 29.9kg/m2 is defined as obese.

Awareness means the awareness level of the respondents regarding diabetes mellitus.

Knowledge refers to the participant's knowledge regarding prevention, treatment, control and complications of diabetes.

Attitude means the participant's attitude towards prevention, treatment, control and complications of diabetes mellitus.

Practice refer to the participant's preventive measures, controls measures in both non-diabetics and diabetics.

Hypertension means systolic blood pressure ≥140 mmHg and diastolic pressure ≥ 90mmHg. (WHO).

Symptoms mean the presentation of diabetic patients.

Risk factors mean the factors that aggravate to cause diabetes mellitus.

Complication means the consequence of diabetes mellitus due to poor control of blood glucose.

Eating behaviors mean the food preferences and pattern of eating of the respondents.

Exercise means a specific activity performed to develop or maintain fitness.

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CHAPTER II
LITERATURE REVIEW

2.1 Impact of non-communicable diseases

Non-communicable diseases are chronic in nature. The duration of them is lifelong and pathogenesis is slowly progressive in nature. Cardiovascular diseases, chronic pulmonary diseases, cancers and diabetes are the major non-communicable diseases. Low and middle income countries have the tremendous impact of non-communicable diseases (IDF). As of WHO data, the number of death by non-communicable diseases will exceed number of combination of deaths caused by nutritional, maternal and child causes in 2030.

Physical inactivity, unhealthy diet, smoking and alcohol drinking causes increased risk of non-communicable disease. Although the incidence of non-communicable disease is predominant in old age people, more than 9 million of deaths which are attributable to NCD occurs before the age of 60 (WHO). These diseases are more prevalent as the globalized spread of unhealthy lifestyles. Unhealthy lifestyles may lead to hypertension, raised plasma glucose, dyslipidemia and increased body weight. (High BMI). The attributable risk factors that lead to death globally are hypertension (16.5%), smoking (9%), increased plasma glucose level (6%), lack of exercise (6%) and high BMI (5%) (WHO).

2.2 Type 1 diabetes mellitus

It is also called insulin-dependent diabetes mellitus. It is considered as an autoimmune disease but the exact pathogenesis is not known. The definitive treatment of it is exogenous insulin injection. There is an increased risk of diabetic ketoacidosis. Symptoms include polyuria, thirst, weight loss and increased appetite. Retinopathy, neuropathy, nephropathy and dermopathy are the common complications of this disease (WHO).

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2.3 Type 2 diabetes mellitus

It constitutes the 90% of total diabetes. There is reduced insulin secretion or decreased utilization of insulin by body cells. Symptoms and complications are the same as type 1 diabetes. The precipitating factors that cause type 2 diabetes are genetic cause, physical inactivity, overweight and unhealthy eating behaviors. Unlike type 1 diabetes, there are alternative treatment choices such as oral hypoglycemic agents depending on the control of disease. It might not be unnoticed or undiagnosed for years. The disease may need insulin when it is not controlled by oral drugs. Although it is mainly prevalent in old age, there is an increasing trend in people less than 60 years of age. (WHO)

2.4 Gestational diabetes

There is the increased blood glucose level during pregnancy. These women have increased risk of permanent diabetes later in their life. (IDF)

2.5 Impaired Glucose tolerance test and impaired fasting glucose

Impaired glucose tolerance test and impaired fasting glucose are the intermediate conditions between normal and diabetic state. According to WHO criteria impaired glucose tolerance test is defined as fasting plasma glucose level from 6.1 mmol/l (110 mg/dl) to 6.9 mmol/l (125 mg/dl). Impaired glucose tolerance test is defined as two-hour glucose levels of 140 to 199 mg/dl (7.8 to 11.0 mmol/l) on the 75-g oral glucose tolerance test. People with impaired glucose tolerance test and impaired fasting glucose are at high risk of developing diabetes mellitus. (IDF)

2.6 Consequences of diabetes mellitus

Increased risk of heart disease and cerebrovascular accident.

Peripheral and central neuropathy. Neuropathy is common in extremities leading to diabetic foot and may lead to amputation.

Easily prone to get local and systemic infections.

Retinopathy that might lead to blindness progressively. About one percent of total cause of blindness is due to diabetes retinopathy.

Nephropathy that might lead to renal failure progressively. (WHO)

2.7 Diagnosis and treatment

Diabetes mellitus is easily diagnosed by the expert medical personnel in the inexpensive blood sugar testing. Diabetes mellitus is currently defined as the fasting plasma glucose level ≥7mmol/L or 126mg/dl (WHO) or 2hr plasma glucose level ≥11.1mmol/L (200mg/dl) (WHO). For type 1 diabetes mellitus, lifelong insulin injection is necessary since there is no endogenous production of insulin by pancreas. For type 2 diabetes mellitus, oral hypoglycemic agents can be used according to the disease condition. As the complications are already present when the type 2 diabetes is diagnosed, regular screening for retinopathy, nephropathy, neuropathy and foot care are essential measures. (WHO)

2.8 Prevention

As diabetes is related with unhealthy lifestyles, modification on lifestyle is equally important as medical treatments. Preventive measures for diabetes for both non-diabetic and for diabetics to prevent complications include

-health education

-eating balanced diet

-regular exercise

-controlling body weight

-medical check-up such as testing random blood sugar and fasting blood sugar

-control of stress

-control of blood pressure

-avoiding smoking and alcohol

-regular checkup for RBS, FBS and hemoglobin A_1C (glycated hemoglobin) and check-up for complications in diabetic patients (WHO).

2.9 Diabetes mellitus as a global concern

Diabetes mellitus is now considered as the major public health problem. The incidence and prevalence of this disease was significantly high both for developed and developing countries.

2.10 Diabetes mellitus in developing countries

The prevalence of diabetes mellitus is higher in developing countries than in developed countries now. Due to economic development in low and middle income countries, the consequence is increased life expectancy and increasing trend in prevalence of lifestyle related and degenerative disease. Those developing countries are experiencing double burden of communicable and non-communicable diseases. Health systems of developing countries still need to be improved and not equipped properly to deal with the double burden of diseases which in turn make adverse effects of health and economy of those countries.

The growing problem of diabetes in developing countries has only been recently recognized due to inadequate standardized data over time. Related studies and data were mainly concerned upon adult and changes of diagnostic criteria made the data more difficult to compare. But these studies and data provide useful information for changing trends of disease prevalence.

In 2007, the global prevalence of diabetic patients were 246 million and 165 million of them were living in developing world. As the diabetes prevalence increases with age, there will be 50% increase in the present prevalence as the WHO and IDF projection and 276 million people in diabetes population will be from developing world in 2025.

In developing countries, the prevalence of diabetes mellitus occurs at the age between 45 and 65 years of age. In those countries, non-communicable diseases

accounted for 50% of burden of disease in 2005 (Reddy et al.) There are various options for treatment of diabetic complication but most people can't afford to use them.

2.11 Prevalence of diabetes mellitus in Thailand

Western Pacific region is one of the regions where the prevalence of diabetes mellitus is rapidly emerging. Data shows that 138 million people in Western Pacific region got diabetes as of 2013. As of IDF (International Diabetic Federation) classification of geographical area, Thailand is involved in Western Pacific region. Thailand has the national diabetes prevalence of 8.45%. According to International diabetic federation, national prevalence of DM in ASEAN countries are as follows.

Table 1: **Prevalence of diabetes mellitus in ASEAN countries**

Country	National Prevalence (%)
Brunei Darussalam	7.69
Cambodia	2.56
Indonesia	5.81
Lao PDR	4.06
Malaysia	16.61
Myanmar	5.79
Philippines	5.89
Singapore	12.83
Thailand	8.45
Vietnam	5.33

(Source. IDF, 2013)

2.12 Health of Myanmar migrant workers

According to 2009 data, there are total of more than 2 million of registered and unregistered Myanmar migrant workers in Thailand. The difference in socio-economic development between these two countries make the Thailand destination of work from Myanmar workers. Despite the strong record of Thailand's public health standard, Myanmar migrant workers are still vulnerable to certain health risks. Variations of socio-demographic characteristics among the migrants also link to the limited access of health care service. There is no universally accepted health model for migrant workers.

Some unregistered, illegally live migrants have to face double burden of challenge for being illegal and fear to get health care service because of their illegal status when they get sick. Health education programs are still need to be improved and implemented among those workers. The prevalence of non-communicable diseases is related with the migration. Migrant populations have double burden of infectious and non-communicable diseases as the other people in developing countries. Limited education standard might lead to limited knowledge of diabetes mellitus, related attitudes and practice measures.

2.13 Prevalence of Diabetes Mellitus in Myanmar migrant workers living in Thailand

Bang Khun Thian district has the population of about 170000. The estimated population of Myanmar migrant workers in this area is about 7000 as of 2011 data. This data was obtained from Network for Migrant Worker's Development, a local NGO located in Bang Bong district. The estimated population is based on the number of migrant workers who have passport. Only workers who have work permit can use health insurance. The prevalence of diabetes among those workers is not known. One study done for Myanmar refugee camps in Myanmar-Thailand border concerning prevalence of gestational DM shows 10% prevalence on HAPO trial and 6.6% on WHO criteria. A study conducted in Karen (also spelled as Kayin), one ethnic group of Myanmar, living in Thasongyang, Thailand revealed 16.72 % people had hyperglycemia, 3.68% in diabetic range and 13.04 % in pre-diabetic state respectively.

2.14 Socio-demographic characteristics

Age

Age is one of the unmodifiable risks factor of diabetes mellitus. The risk of getting diabetes increases with age (American Diabetic Association). About 27% of US residents over 65 years of age have diabetes. According to WHO, there is gradually increasing trend of diabetes prevalence under 60 years of age globally. In developing countries, diabetes occurs between 45 and 65 years of age (Reddy et al, 2005). Diabetics

who were diagnosed before 39 years of age and getting regular treatments are more aware of this disease than older age groups (Caliskan et al, 2005).

Sex and marital status

There is no difference in prevalence of diabetes mellitus between men and women. But certain risk factors difference between both sexes might facilitate the occurrence of diabetes to the specific sex. A study in Turkey has shown that males are more aware of diabetes mellitus than females. Male knew more than female concerning knowledge about diabetes (Nisar et al. 2008). But some studies have shown that there is no association between diabetes awareness and gender (Caliskan et al, 2005). There is no association between marital status and prevalence of diabetes mellitus (Rahmanian et al. 2013)

Education

Many studies concluded that education status influences the awareness of diabetes mellitus. The study done in the Gambia has shown that university students are more aware of diabetes mellitus than the respondents with no formal education and so were the high school students than middle school students (Foma et al. 2013). Education level had strong association with knowledge of diabetes mellitus (Yun et al. 2007).

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Occupation

Study in Malaysia showed that type of occupation is related to the awareness of diabetes mellitus (Yun et al. 2007). A study in Northern India also showed that employment status is associated with awareness of diabetes mellitus (Murugesan et al. 2007).

2.15 Risk factors related to prevalence of diabetes mellitus

According to international diabetic federation, risk factors of type 2 diabetes mellitus are increasing age, overweight (BMI >24.9 kg/m^2), smoking, high blood pressure (systolic blood pressure ≥ 140 mmHg and diastolic blood pressure ≥ 90

mmHg), unhealthy diet, high cholesterol level, physical inactivity, impaired glucose tolerance test, family history of diabetes mellitus and gestational diabetes. One study which was conducted among the migrant Latino people in Massachusetts showed that they showed limited awareness of risk factors for diabetes mellitus. (Rosal et al. 2011).

2.16 Knowledge, attitudes and practices regarding diabetes mellitus

Several studies have shown that the awareness level of diabetes mellitus is low. The study in the Gambia showed that only 47% know what diabetes is. 53% of people who were aware of diabetes didn't know the cause of diabetes and 50% didn't know the preventive measures of diabetes mellitus. Awareness level regarding cause of diabetes mellitus, risk factors, complications and management were also low among the general population of the Gambia (Foma et al. 2013). In the study of Tarlai (rural Islamabad), Pakistan, 43% of respondents were aware of diabetes and its risk factors. People who went to health care provider were more aware of diabetes than people who didn't. Even the respondents who had diabetic patient in the family were not aware of diabetes mellitus (Ulvi et al. 2009).

The study in Malaysia showed that diabetes patients showed more awareness than the healthy people. That might be because of their perception that lack of knowledge might worsen the disease. Self-monitoring of blood glucose is the important indicator of diabetes awareness. None of the participants knew that there are various types of diabetes mellitus.

Proper and successful management of diabetes mellitus depends on thorough application of preventive measures and clinical intervention, detecting the disease and promoting self –management. The lack of significant difference in mean score for knowledge of pathology between diabetes and healthy patient alerts the need for considering more efficient health education about the basic of disease towards the diabetic population (Yun et al.2007).

CHAPTER III
RESEARCH METHODOLOGY

3.1 Research Design

Cross-sectional descriptive, analytical and quantitative study

3.2 Study Area

Bang Khun Thian District, Bangkok, Thailand.

3.3 Study Population: among Myanmar migrant workers.

3.4 Research criteria

3.4.1 Inclusion criteria

Myanmar migrant workers of 18 years of age and above, both males and females, who have been living in Thailand for at least 2 weeks.

3.4.2 Exclusion criteria

Myanmar migrant workers who are not willing to participate in the research. Myanmar migrant workers who do not understand Burmese language.

3.5 Sample Size

Cochran's formula was used.

The estimated prevalence of 50% (p=0.5) was used in order to get the maximum sample size since the prevalence of diabetes mellitus among the study population is not known.

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The sample size was

$$n = \frac{z^2 p(1-p)}{d^2}$$

$$= \frac{(1.96)^2 (0.5)(0.5)}{0.05^2} = 384 + 38(\text{10\% of sample size for non-respondents}) = 422$$

n= minimum sample size

d=allowance of error

p=unknown population (Estimated prevalence of 50%)

z=reliability coefficient (1.96)

3.6 Study period

From November, 2014 to July, 2015.

3.7 Sampling techniques

According to 2011 data(This means the data obtained from Network of Migrant Worker's Development who made the cluster mapping of the residence of Myanmar migrant workers in some areas of Bang Khun Thian and Bang Bong districts), the estimated population of Myanmar migrant worker in Bang Khun Thian district is about 7000. There are two sub-districts in Bang Khun Thian district: Tha Kham and Samae Dang. From Tha Kham sub-district, Tha Kham Soi 14, Thian Thale Soi 7, and Bang Khun Soi 14 areas were selected randomly. Specific mapping indicating the number of respondents from these areas was done according to the data that was given by local NGO. Samae Dang sub-district was reserved for sampling population in case there was not enough sample size with Tha Kham subdistrict. All members of the household who involved in inclusion criteria were asked to participate in the research.

3.8 Data collection tools

Structured interviewer-administered questionnaires were used for data collection. The components of questionnaires are

Socio-demographic characteristics

Basic awareness of diabetes mellitus

Assessment of some risk factors for diabetes mellitus

Knowledge on causes and risk factors of diabetes mellitus

Knowledge on diabetes regarding prevention and treatment and control

Attitude towards the causes, risk factors, symptoms, complications, preventive and control measures and management of diabetes mellitus

Practice of both diabetes and non-diabetes patients regarding preventive measures of diabetes mellitus.

Practice of diabetic patient regarding treatment, control regular checkup

3.9 Data collection process

Face to face interview was used for the research. The data was collected by filling the questionnaire prepared by the principal researcher. The data collectors were the principal researcher and the trained assistants. Trained assistants were Myanmar voluntary workers worked at the Network for Migrant Workers Development. They

were trained how to ask the questionnaires by the chief researcher prior to the face to face interview. The locations of interview were mainly on the houses of correspondent as well as on the other places like canteens and football fields which are close to the respondents' house. All eligible persons who involved in inclusion criteria would have to answer the question. Before conducting the survey the interviewers carefully explained about the process of survey and guaranteed the answerers about their confidentiality. The respondents must ascertain that they all were enthusiastic to get involved in the study and they had knowledge required enough to interpret and respond the questions. If any respondent of the household was absent at the time of data collection, the respondent(s) who would present at that time would be notified that the study would be done again for the absent respondent (s) and the research team would need to go back again. Respondents from areas which were not originally involved in random sampling areas would be asked to participate the survey in case the sample size would not be enough. So they would be targeted as reserved participants and the required mapping for them would be made before the research. Interview were taken on Sunday which is the holiday of the migrant workers, so they had free time on that day.

There are five parts in the questionnaires: (1) socio-demographic characteristics, awareness assessment and risk factors assessment for diabetes mellitus (2) Knowledge questions regarding diabetes mellitus (3) Attitude questions regarding diabetes mellitus (4) Practice questions regarding diabetes mellitus for all respondents and (5) Practice questions for the diabetes patients.

Scoring system for knowledge questions

For positive statements	For negative statements
1=False	1=True
2=Not sure	2=Not sure
3=True	3=False

The possible maximum total knowledge score for each respondent is 90. The knowledge scores are calculated as "0 to 62=Poor" (<70%), "63 to 72 =Moderate" (70-80%) and "73 to 90=Good" (>80%). The lowest score is estimated as 0 instead of 30 as there were some missing responses.

Scoring system for attitude questions

For positive statements	For negative statements
1= Strongly disagree	1=Strongly agree
2= Disagree	2=Agree
3=Not sure	3=Not sure
4=Agree	4=Disagree
5=Strongly agree	5=Strongly disagree

The possible maximum total attitude score for each respondent is 55. The attitude scores were calculated as “0 to 38=Poor” (<70%), “39 to 44 = Moderately positive” (70-80%) and “45 to 55=Good” (>80%). The lowest score is estimated as 0 instead of 11 as there were some missing responses.

Scoring system for practice questions

1=Regularly

2=Often

3=Sometimes

4=Seldom

5=Never

The possible maximum total practice scores of the questionnaire for all respondents is 25. The practice scores were calculated as “0 to 17=Poor” (<70%), “18 to 20 = Moderately positive” (70-80%) and “21 to 25=Good” (>80%). The lowest score is estimated as 0 instead of 5 as there were some missing responses.

The possible maximum total practice scores for the questionnaire for diabetic patients is 30. The practice scores were calculated as “lowest to 20=Poor” (<70%), “21 to 24 = Moderate” (70-80%) and “25 to 30=Good” (>80%). The lowest score is estimated as 0 instead of 5 as there were some missing responses.

3.10 Reliability and validity

A pretest (Pilot test) was done using 10% of sample size in Bang Bong district to test the reliability. Questionnaire had to be revised after the pretest. Cronbach’s alpha coefficient was used to test the reliability of the questionnaire. For validity,

questionnaire was checked by expert supervisor and researchers and was revised according to their suggestion.

3.11 Data entry and data analysis process

Questionnaires were coded. Data analysis is done in according to general and specific objectives of the research. Frequency, mean and percentage are calculated as descriptive statistics of socio-demographic characteristics. Chi-square test is used as an inferential statistics of the categorical data for both independent and dependent variables. Regression analyses were done using linear and logistic regression methods. The data analysis was done by using Statistical Package of Social Science (SPSS) software version 21.

3.12 Limitation of the study

There was the limitation of time as most of the workers were free to answer the questions only at Sunday which is the only day in a week they were free from work. As this study was conducted in limited sampled population, the result could be specific only to that study population. There were some people who missed to answer some questions of the questionnaire. Some houses were not convenient for interview so canteens, football fields and balconies were used instead for interview locations.

3.13 Ethical consideration

This study was done under the approval of ethical committee of Chulalongkorn University. Prior to interview, the purpose, process, ethical issues and benefits of the study were explained to the participants and they were assured of their confidentiality. The questionnaires would be asked only after getting the informed consent. The participants were also ensured that they could withdraw from the interview if they do not want to participate at any time.

3.14 Expected benefits and outcomes

Knowledge, attitudes and practices regarding diabetes mellitus among the studied population could be assessed. Although this study was not intended to measure the prevalence of diabetes mellitus, rough estimation of diabetes prevalence could be done by face to face interview of the respondents.

CHAPTER IV
RESULTS

This section depicts the research findings which include the socio-demographic characteristics, presence of risk factors for diabetes mellitus, awareness of diabetes mellitus and knowledge, attitudes and practices regarding diabetes mellitus among Myanmar migrant workers living in Bang Khun Thian district, Bangkok, Thailand. The total number of participants in this study was 437. The initial estimated sample size after adding 10% of required sample size was 422. But there were some participants who did not answer some questions completely. So to ensure for getting enough respondents 15 samples were added and the total sample size became 437. There was no drop-out participant. Some socio-demographic data are missed to be filled in by the research assistants.

Part 1-Descriptive findings

4.1 Socio-demographic characteristics

Table 2 shows the social-demographic characteristics of the respondents. There were 286 male participants and 151 female participants. The mean age of the respondents was 28.9 years ranging from 18 to 57 years. Age ranges were categorized into 3 sub-groups: “18-30” years, “31-43” years and “≥ 44 years”. Most of the respondents are between 18 and 30 years of age (62.5%). Most of the participants are married (64.3%). For educational background, most respondents are at the middle school level (38.7%). From those migrant workers who participated in the research, majority are the factory workers (84.2%). Most of them have work permit (89.5 %) and most have been living in Thailand for more than one year at the time of interview (86%). The majority of the ethnic groups are Burmese (52.9%).

Table 2: **Socio-demographic characteristics**

Socio-demographic characteristics	Number(n=437)	Percentage (%)
Age in years		
18-30	273	62.5
31-43	141	32.3
≥44	14	3.2
Missing	9	2.1
Gender		
Male	286	65.0
Female	151	35.0
Marital Status		
Single	143	32.7
Married	281	64.3
Divorced	4	0.9
Widowed	2	0.5
Separated	3	0.7
Missing	4	0.9
Education		
Can read and write, never attended the school	22	5.0
Primary school level	126	28.8
Middle school level	169	38.7
High school level	99	22.7
University level	16	3.7
Other	1	0.2
Missing	4	0.9
Occupation		
Factory worker	368	84.2
Construction worker	24	5.5
Dependent	24	5.5
Other	17	3.9
Missing	4	0.9

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Table 2: (Continued) Socio-demographic characteristics

Socio-demographic characteristics	Number(n=437)	Percentage (%)
Working Status		
With work permit	391	89.5
Without work permit	41	9.4
Missing	5	1.1
Duration of living in Thailand		
2 weeks to 1 year	51	11.7
Above 1 year	376	86.0
Missing	10	2.3
Ethnicity		
Burmese	231	52.9
Mon	18	4.1
Rakhine	105	24.0
Shan	30	6.9
Kayin	13	3.0
Other	36	8.2
Missing	4	0.9

4.2 Awareness indexes of diabetes mellitus

Table 3 describes the results regarding the general awareness of diabetes mellitus. Most of the respondents have ever heard of diabetes (91 %) and only 38 respondents (8.7%) of total have never heard of that disease. But most of the respondent have never heard of gestational diabetes and insulin: 58.4 % and 77.1% respectively. After interviewing all respondents, only 3 persons (0.7%) reported that they have diabetes according to the diagnosis of the medical doctor. 25 respondents (5.7%) did not know whether they have diabetes mellitus or not.

Table 3 : Awareness indexes of diabetes mellitus

Question	Number	Percentage (%)
Have you ever heard of diabetes mellitus?(n-437)		
Yes	398	91.1
No	38	8.7
Missing	1	0.2
Have you ever heard of gestational diabetes?(n=437)		
Yes	167	38.2
No	255	58.4
Missing	15	3.4
Have you ever heard of insulin? (n=437)		
Yes	100	22.9
No	337	77.1
According to medical check-up, have you ever been told by a medical doctor that you had diabetes mellitus? (n=437)		
Yes	3	0.7
No	403	92.2
Don't know	25	5.7
Missing	6	1.4
If you have diabetes mellitus, how long have you been diagnosed as diabetics by a medical doctor?(n=3)		
One year and above	3	100.0

4.3 Presence of risk factors for diabetes mellitus

Table 4 describes the assessment of presence of risk factors concerning the prevalence of diabetes mellitus. Of all female respondents, 97 (22.2%) reported that they were pregnant and of these, just 4 respondents told that they have been informed that they had gestational diabetes during their pregnancy. 62 respondents (14.2%) have diabetic(s) in their family. Regarding relationship with diabetic family member(s) from these respondents, only for 58 respondents could be collected and those findings are used only for descriptive statistics. For Body mass index calculation, total of 421 out of 437 could be calculated. Most of the respondents (71.6%) were within normal BMI

range (18.5-24.9kg/m^2). Most respondents have never smoked (62.7%). 368 respondents answered that they don't have hypertension and only 46 respondents (10.5%) reported that they have hypertension according to the diagnosis of the medical doctor.

Table 4 : Presence of risk factors for diabetes mellitus

Risk factor	Number	Percentage
Have you ever been told by a medical doctor that you had gestational diabetes when you were pregnant?(Only for female respondents who were pregnant) (n=103)		
Yes	4	3.8
No	82	79.6
Don't know	7	6.8
Missing	10	9.7
Do you have diabetic(s) in your family? (n=437)		
Yes	62	14.2
No	352	80.5
Don't know	20	4.6
Missing	3	0.7
If you have diabetic (s) in your family, what is your relationship with him/her/them? (n=62)		
Parent	27	46.6
Sibling	6	10.3
Grandparent	13	22.4
Parent and sibling	3	5.2
Parent and grandparent	3	5.2
Sibling and child	2	3.4
Other	4	6.4
Missing	4	6.4

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Table 4: (Continued) Presence of risk factors for diabetes mellitus

Risk factor	Number(n=437)	Percentage
BMI		
Below normal BMI range	55	12.6
Within normal BMI range	313	71.6
Overweight	46	10.5
Obese	7	1.6
Missing	16	3.7
Do you smoke?		
Yes	142	32.5
No	274	62.7
Quit	17	3.9
Missing	4	0.9
According to medical check-up, have you ever been told by a medical doctor that you have hypertension?		
Yes	46	10.5
No	368	84.2
Don't know	20	4.6
Missing	3	0.7

4.4 Knowledge regarding diabetes mellitus

4.4.1 Knowledge scores for each question

Table 5 shows the percentage distribution of knowledge score for each of the knowledge questions both for males and females. For positive statement, most of the respondents give the correct answers (more than 50% for each gender). But regarding the causes of diabetes mellitus, 49.6 percent of male respondents were not sure that it is caused by insulin deficiency and only 48.2 percent of them answered true to that statement. 17.9 % of males and 9.3% of females believed that diabetes mellitus is not associated with genetic predisposition.

For negative statements, there are significant reduction of correct answer. For question no. 12, most of the respondents (male 81.3% and female 78.7%) thought that there are special foods for diabetic patients. Similarly for question no. 14, most of the

respondents (male 76.2% and female 77.2%) thought that diabetes mellitus is the condition that there is raised sugar level in the urine only.

Table 5 : Knowledge scores for each question

Question 1	Male	Female
Prevalence of diabetes mellitus can be reduced by	Number (%)	Number (%)
1.1 Doing regular exercise at least 30 minutes per day (n=436)		
True	230 (80.4)	108 (72.0)
Not Sure	52 (18.2)	39 (26.0)
False	4 (1.4)	3 (2.0)
1.2 Maintaining normal body weight (n=436)		
True	238 (83.2)	120 (80.0)
Not Sure	42 (14.7)	27 (18.0)
False	6 (2.1)	3 (2.0)
1.3 Avoid overeating of sweet foods (n=436)		
True	265 (92.7)	136 (90.7)
Not Sure	18 (6.3)	14 (9.3)
False	3 (1.0)	0 (0)
1.4 Eating vegetables regularly (n=436)		
True	264 (92.3)	138 (92.0)
Not Sure	18 (6.3)	11 (7.3)
False	4 (1.4)	1 (0.7)

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Table 5: (Continued) Knowledge scores for each question

Question 2	Male	Female
Causes of diabetes mellitus	Number (%)	Number (%)
2.1 Genetic cause (n=435)		
True	149 (52.3)	103 (68.7)
Not Sure	85 (29.8)	33 (22.0)
False	51 (17.9)	14 (9.3)
2.2 Overeating of sweet foods (n=435)		
True	231 (81.1)	123 (82.0)
Not Sure	36 (12.6)	21 (14.0)
False	18 (6.3)	6 (4.0)
2.3 Insulin deficiency (n=433)		
True	137 (48.2)	76 (51.0)
Not Sure	141 (49.6)	72 (48.3)
False	6 (2.1)	1 (0.7)

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Table 5: (Continued) Knowledge scores for each question

Question 3	Male	Female
Complications of diabetes mellitus	Number (%)	Number (%)
3.1 Retinopathy (eye disease)(n=436)		
True	195 (68.2)	109 (72.7)
Not Sure	77 (26.9)	36 (24.0)
False	14 (4.4)	5 (3.3)
3.2 Proneness to infections(n=435)		
True	172 (60.4)	101 (67.3)
Not Sure	73 (25.6)	39 (26.0)
False	40 (14.0)	10 (6.7)
3.3Nephropathy(n=433)		
True	167 (58.8)	95 (63.8)
Not Sure	100 (35.2)	50 (33.6)
False	17 (6.0)	4 (2.7)
3.4 Ischemic heart disease(n=436)		
True	177 (61.9)	95 (63.3)
Not Sure	90 (31.5)	46 (30.7)
False	19 (6.6)	9 (6.0)
3.5 Stroke(n=436)		
True	160 (55.9)	91 (60.7)
Not Sure	106 (37.1)	50 (33.3)
False	20 (7.0)	9 (6.0)

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Table 5: (Continued) Knowledge scores for each question

Question 4	Male	Female
Management of diabetes mellitus	Number (%)	Number (%)
4.1 Diet control (n=435)		
True	268 (94.0)	133 (88.7)
Not Sure	14 (4.9)	15 (10.0)
False	3 (1.1)	2 (1.3)
4.2 Regular exercise(n=436)		
True	246 (86.0)	121 (80.7)
Not Sure	34 (11.9)	25 (16.7)
False	6 (2.1)	4 (2.7)
4.3 Control of body weight(n=436)		
True	245 (85.7)	128 (86.3)
Not Sure	33 (11.5)	20 (13.3)
False	8 (2.8)	2 (1.3)
4.4 Prescribed medications(n=432)		
True	245 (85.7)	128 (84.8)
Not Sure	32 (11.2)	19 (12.6)
False	6 (2.1)	2 (1.3)

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Table 5: (Continued) Knowledge scores for each question

Question 5	Male	Female
Symptoms of diabetes mellitus	Number (%)	Number (%)
5.1 Frequent urination (polyuria)(n=436)		
True	229 (80.1)	124 (82.7)
Not Sure	50 (17.5)	24 (16.0)
False	7 (2.4)	2 (1.3)
5.2 Frequent thirst(n=436)		
True	208 (72.7)	113 (35.2)
Not Sure	71 (24.8)	35 (23.3)
False	7 (2.4)	2 (1.3)
5.3 Frequent hunger(n=435)		
True	170 (59.6)	94 (62.7)
Not Sure	100 (35.1)	48 (32.0)
False	15 (5.3)	8 (5.3)
5.4 Weight loss(n=436)		
True	197 (68.9)	107 (71.3)
Not Sure	58 (20.3)	34 (22.7)
False	31 (10.8)	9 (6.0)
5.5 Impaired wound healing(n=436)		
True	220 (76.9)	125 (83.3)
Not Sure	55 (19.2)	23 (15.3)
False	11 (3.8)	2 (1.3)

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Table 5 : (Continued) Knowledge scores for each question

Question	Male	Female
	Number (%)	Number (%)
6. Diabetes mellitus is more prevalent in the people with the age of 40 and above. (n=430)		
True	222 (79.0)	125 (83.9)
Not Sure	47 (16.7)	21 (14.1)
False	12 (4.3)	3 (2.0)
7.Diabetes mellitus is also prevalent among the people below the age of 40.(n=436)		
True	220 (76.9)	125 (83.3)
Not Sure	55 (19.2)	21 (12.7)
False	11 (3.8)	4 (2.6)
8. Diabetes mellitus can be diagnosed by blood glucose testing. (n=436)		
True	234 (81.8)	128 (84.8)
Not Sure	42 (14.7)	19 (12.6)
False	10 (3.5)	3 (2.0)
9.Smoking is associated with the prevalence of diabetes mellitus.(n=435)		
True	159 (55.6)	81 (54.4)
Not Sure	106 (37.1)	59 (39.6)
False	21 (7.3)	9 (6.0)
10. Diabetes patients need to seek for regular medical checkup to prevent and get treatment for complications. (n=434)		
True	267 (93.4)	130 (86.1)
Not Sure	18 (6.3)	17 (11.3)
False	0 (0)	2 (1.3)

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Table 5: (Continued) Knowledge scores for each question

Question	Male	Female
	Number (%)	Number (%)
11. There is no specific relation between the prevalence of diabetes mellitus and gender difference.(n=433)		
True	269 (80.9)	126 (84.0)
Not Sure	37 (13.1)	22 (14.7)
False	17 (6.0)	2 (1.3)
12. There are special foods for diabetes patients. (*)(n=434)		
True	231 (81.3)	118 (78.7)
Not Sure	40 (14.1)	28 (18.7)
False	13 (4.6)	4 (2.7)
13. There are two types of diabetes mellitus(n=429)		
True	148 (52.7)	90 (60.8)
Not Sure	120 (42.7)	53 (35.8)
False	13 (4.6)	5 (3.4)
14. Diabetes mellitus means raised sugar level in the urine only. (*)(n=422)		
True	211 (73.8)	112 (77.2)
Not Sure	56 (19.6)	32 (22.1)
False	10 (3.5)	1 (0.7)

* Negative question

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4.4.2 Total knowledge scores

This section shows the sum of each knowledge questions given by participants of both sexes. The possible total scores for knowledge questionnaire range from 0 to 90.The knowledge scores are classified as poor (less than 70% of the maximum total score), moderate (70-80% of the maximum total score) and good (above 80% of the maximum total score).Most of the participants got good total knowledge score. Most of the male (77.3%) got good knowledge score whereas 19.6 % and 3.1 % got moderate and poor knowledge respectively. For female respondents, 86.1% got good knowledge score and only 9.3 % and 4 % got moderate and poor knowledge scores respectively.

Table 6 : Total knowledge score

Knowledge score	Male	Female
(n=436)	Number (%)	Number (%)
Poor (<70%)	9 (3.1)	6 (4.0)
Moderate (70-80%)	56 (19.6)	14 (9.3)
Good (>80%)	221 (77.3)	130 (86.1)

4.5 Attitude regarding diabetes mellitus

4.5.1 Attitude scores for each question

This sections shows the scores of each attitude question from both sexes. Most of the respondents got moderately positive attitude scores in positive statements. As in knowledge questions, most of the respondents got poor attitude scores in negative statements. Only 15.6 % of males and 15.5% of females didn't agree the statement that diabetes mellitus is more prevalent in rich people. Likewise, most of the respondents (79.9% of males and 81.2% of females) believed that medication is the only way to control diabetes mellitus.

Table 7 : Attitude scores for each question

Question	Male	Female
	Number (%)	Number (%)
1. We should aware of diabetes mellitus as its prevalence is increasing globally. (n=435)		
Strongly agree	118 (41.4)	60 (40.0)
Agree	150 (52.6)	81 (54.0)
Not sure	11 (3.9)	8 (5.3)
Disagree	5 (1.8)	1 (0.7)
Strongly disagree	1 (0.4)	0 (0)
2. I believe that if I am diabetic, my children will have high risk of having diabetes. (n=435)		
Strongly agree	64 (22.5)	42 (28.0)
Agree	119 (41.8)	73 (48.7)
Not sure	76 (26.7)	26 (17.3)
Disagree	18 (6.3)	6 (4.0)
Strongly disagree	8 (2.8)	3 (2.0)
3. I think we should reduce stresses as much as possible to prevent the incidence of diabetes mellitus.(n=434)		
Strongly agree	71 (25.0)	40 (26.7)
Agree	137 (48.2)	73 (48.7)
Not sure	58 (20.4)	32 (21.3)
Disagree	15 (5.3)	5 (3.3)
Strongly disagree	3 (1.0)	0 (0)

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Table 7: (Continued) Attitude scores for each question

Question	Male	Female
	Number (%)	Number (%)
4. I think we should do regular exercise to prevent diabetes mellitus.(n=432)		
Strongly agree	68 (23.9)	35 (23.6)
Agree	180 (63.4)	85 (57.4)
Not sure	32 (11.3)	25 (16.9)
Disagree	3 (1.1)	2 (1.4)
Strongly disagree	1 (0.4)	1 (0.7)
5. I believe eating less salty, sweet and oily food can help us to prevent diabetes mellitus.(n=436)		
Strongly agree	94 (32.9)	50 (34.7)
Agree	167 (58.4)	89 (59.3)
Not sure	22 (7.7)	10 (6.7)
Disagree	1 (0.3)	1 (0.7)
Strongly disagree	2 (0.7)	0 (0)
6. I think tight fitting shoes should be avoided for diabetes patients.(n=435)		
Strongly agree	57 (20.0)	32 (21.3)
Agree	141 (49.5)	87 (58.0)
Not sure	78 (27.3)	29 (19.3)
Disagree	7 (2.5)	2 (1.3)
Strongly disagree	2 (0.7)	0 (0)
7. I think we could check the blood glucose regularly to know whether we have diabetes mellitus or not. (n=434)		
Strongly agree	84 (29.4)	44 (29.1)
Agree	175 (61.2)	90 (59.6)
Not sure	18 (6.3)	16 (10.6)
Disagree	4 (1.4)	0 (0)
Strongly disagree	3 (1.0)	0 (0)

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Table 7: (Continued) Attitude scores for each question

Question	Male	Female
	Number (%)	Number (%)
8. I think the diabetes patients must check their blood glucose regularly. (n=433)		
Strongly agree	77 (27.1)	46 (30.9)
Agree	177 (62.3)	88 (59.1)
Not sure	27 (9.5)	15 (10.1)
Disagree	1 (0.4)	0 (0)
Strongly disagree	2 (0.7)	0 (0)
9. I think that diabetes mellitus is a chronic disease and it has to be cured and controlled throughout the life. (n=435)		
Strongly agree	78 (27.4)	42 (28.0)
Agree	135 (47.4)	68 (45.3)
Not sure	54 (18.9)	29 (19.3)
Disagree	13 (4.6)	9 (6.0)
Strongly disagree	5 (1.8)	2 (1.3)
10. I think that diabetes mellitus is more prevalent in rich people. (*) (n=432)		
Strongly agree	54 (19.1)	29 (19.2)
Agree	102 (36.0)	52 (34.4)
Not sure	83 (29.3)	45 (29.8)
Disagree	28 (9.9)	12 (8.1)
Strongly disagree	16 (5.7)	11 (7.4)
11. I think that diabetes mellitus can be managed by medications only. (*) (n=432)		
Strongly agree	88 (31.1)	42 (28.2)
Agree	138 (48.8)	79 (53.0)
Not sure	32 (11.3)	22 (14.8)
Disagree	22 (7.8)	6 (4.0)
Strongly disagree	3 (1.1)	0 (0)

* Negative question

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4.5.2 Total attitude scores

Total sum of attitude scores from 11 questions were calculated. The possible total scores for attitude questionnaires range from 0 to 55.The attitude scores are classified as poor (less than 70% of total score), moderately positive (70-80% of total score) and good (above 80% of total score). Most participant showed moderately positive level of attitude by getting score between 70 to 80 % of total: 53.8 % of males and 50 % of females respectively. But there are poorer attitude scores than good attitude scores in both sexes. For male participants, 27.6 % got poor attitude scores whereas just 18.5 % got good attitude score. Similarly in the female counterparts, 26 % got poor attitude scores when only 24 % got good attitude score.

Table 8: Total attitude scores

Attitude score (n=436)	Male Number (%)	Female Number (%)
Poor (<70%)	79 (27.6)	39 (26.0)
Moderately positive (70-80%)	154 (53.8)	75 (50.0)
Good (>80%)	53 (18.5)	36 (24.0)

4.6 Practices regarding diabetes mellitus

For practices regarding diabetes mellitus, two sets of questionnaires were used: one for all respondents and the other one for only diabetes patients.

4.6.1 Practice scores for each question distributed to both non-diabetics and diabetics

Most of the respondents took the practice measures involved in the questionnaires. Most of them did not regularly seek for medical check-up, particularly female participants (46%) whereas just 21.2% of their male counterparts did that measure regularly.

Table 9: Total practice scores

Practice Question	Male	Female
	Number (%)	Number (%)
1. I do regular exercise at least 30 minutes per day (n=432)		
Regularly	99 (35.1)	37 (24.7)
Often	20 (7.1)	10 (16.7)
Sometimes	87 (30.9)	34 (22.7)
Seldom	35 (12.4)	14 (9.3)
Never	41 (14.5)	55 (36.7)
2. I seek for medical check-up with the physician (n=433)		
Regularly	60 (21.2)	12 (8.0)
Often	28 (9.9)	14 (9.3)
Sometimes	81 (28.6)	43 (28.7)
Seldom	27 (9.5)	7 (4.7)
Never	87 (30.7)	74 (49.3)
3. I eat vegetables.(n=433)		
Regularly	186 (65.5)	102 (68.5)
Often	34 (12.0)	13 (8.7)
Sometimes	57 (20.1)	31 (20.8)
Seldom	5 (1.8)	0 (0)
Never	2 (0.7)	3 (2.0)

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Table 9: (Continued) Total practices scores

Practice Score	Male	Female
	Number (%)	Number (%)
4. I eat less sweet and less oily foods. (n=431)		
Regularly	177 (62.8)	82 (55.0)
Often	25 (8.9)	6 (4.0)
Sometimes	54 (19.1)	33 (22.1)
Seldom	8 (2.8)	10 (6.7)
Never	18 (6.4)	18 (12.1)
5. I eat less salty foods and salty spices. (n=431)		
Regularly	178 (63.1)	77 (51.7)
Often	24 (8.5)	15 (10.1)
Sometimes	46 (16.3)	27 (18.1)
Seldom	17 (6.0)	10 (6.7)
Never	17 (6.0)	20 (13.4)

4.6.2 Total practice scores for all respondents

Total sum of practice scores were calculated from 5 questions answered by 437 respondents. The possible total scores for practice questionnaires range from 0 to 25.The practice scores are classified as poor (less than 70% of total score), moderate (70-80% of total score) and good (above 80% of total score). Most of the male respondents (41.5%) have good level of practice score which means above 80% of total practice score. But only 25.3% of female got good practice score when most of them (56.7%) got poor level of practice score (less than 70%).

Table 10: Total practices scores

Practice score	Male	Female
(n=434)	Number (%)	Number (%)
Poor	102 (35.9)	85 (56.7)
Moderate	64 (22.5)	27 (18.0)
Good	118 (41.5)	38 (25.3)

4.6.3 Practice questions for diabetes patients

From 437 participants, only 3(male 2, female 1) reported that they have diabetes according to the diagnosis of medical doctor. The possible total scores for practice questionnaires range from 0 to 30.The practice scores were classified as poor (less than 70% of total score), moderate (70-80% of total score) and good (above 80% of total score). From 2 male respondents, both take most of the practice measures except for one who never went for eye examination and blood glucose examination. The only female diabetic respondent took just some of the practice measures particularly the use of prescribed drugs for diabetes and reserving of food for hypoglycemia.

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Table 11: Practice question scores for diabetes patients

Practice question for diabetes patient (n=3)	Male Number (%)	Female Number (%)
1. I get eye examination.		
Regularly	1(50.0)	0 (0)
Never	1(50.0)	1(100.0)
2. I check my blood glucose regularly.		
Regularly	1(50.0)	0 (0)
Never	1(50.0)	1(100.0)
3. I take the medications for diabetes as prescribed by the medical doctor.		
Regularly	2(100.0)	1(100.0)
4. I eat my diet as instructed by the medical doctor.		
Regularly	2(100.0)	0 (0)
Never	0 (0)	1(100.0)
5. I reserve food for hypoglycemia.		
Regularly	2(100.0)	1(100.0)
6. I seek for treatment every time I feel sick.		
Regularly	2(100.0)	0 (0)
Never	0 (0)	1(100.0)

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4.6.4 Total practice scores for diabetes patients

From 3 respondents(2 men and 1 woman), only one man get good practice score which is above the 80% of total practice score for diabetes patient. Another man got moderate practice score and the only woman got poor level of practice score.

Table 12 : **Total practice scores for diabetes patients**

Practice score for diabetes patients	Male	Female
(n=3)	Number (%)	Number (%)
Poor (<70%)	0 (0)	1(100.0)
Moderate (70-80%)	1 (50.0)	0 (0)
Good (≥80%)	1 (50.0)	0 (0)

Part II Bivariate analysis

4.7 Relationship between socio-demographic characteristics and awareness of diabetes mellitus

Analysis between socio-demographic characteristics of the respondents and their status of awareness about diabetes mellitus was done using Chi square analysis. The level of awareness measure were based on the facts: “Have you ever heard of diabetes mellitus?”, “Have you ever heard of gestational diabetes?”, “Have you ever heard of insulin?”, “Do you realize whether you have diabetes mellitus or not?” and “Do you know how long you have been diabetics if you have known you are diabetics according to the diagnosis of medical doctor?” Statistical significance is at 0.05 p value. There is no statistical significances between age and level of awareness except for awareness of gestational diabetes (p = 0.004). There is also no statistical significance between gender difference, marital status, education, occupation and all measures of awareness level of diabetes mellitus. There is are associations between working status (having work permit or not) and awareness of gestational diabetes (p = 0.018). There is an association between duration of living in Thailand and awareness of diabetes mellitus (p=0.015). There are associations between ethnicity with two variables or awareness: awareness of diabetes mellitus (p= 0.026) and awareness to realize whether having diabetes

mellitus or not (p=0.033). The chi square tables which contained at least one statistically significance are described below.

Table 13: Relationship between socio demographic characteristics and awareness of diabetes mellitus (HEHDM means "Have you ever heard of diabetes mellitus?")

Socio-demographic characteristics	HEHDM		Chi square	p value
	Yes Number (%)	No Number (%)		
Age(years) (n=428)			1.411	0.8(Fisher's)
18-30	248(90.8)	25 (9.2)		
31-44	128(90.8)	13 (9.2)		
≥44	14(100.0)	0 (0)		
Gender (n=436)			0.43	0.512
Male	262(91.9)	23 (8.1)		
Female	136 (90.1)	15 (9.9)		
Marital status (n=433)			5.208	0.334(Fisher's)
Single	132 (92.3)	11 (7.7)		
Married	255 (90.7)	26 (9.3)		
Divorced	4 (100.0)	0 (0)		
Widowed	1 (50.0)	1 (50.0)		
Separated	3 (100.0)	0 (0)		
Education (n=433)			8.609	0.105(Fisher's)
Can read and write (Never attended the school)	19 (86.4)	3 (13.6)		
Primary school level	109 (86.5)	17 (13.5)		
Middle school level	155 (91.7)	14 (8.3)		
High school level	95 (96.0)	4 (4.0)		
University	16 (100.0)	0 (0)		
Other	1 (100.0)	0 (0)		

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Table 13: (Continued) Relationship between socio demographic characteristics and awareness of diabetes mellitus (HEHDM means "Have you ever heard of diabetes mellitus?")

Socio-demographic characteristics	HEHDM		Chi Square	p value
	Yes Number (%)	No Number (%)		
Occupation (n=433)			1.066	0.693 (Fisher's)
Factory worker	337 (91.6)	31 (8.4)		
Construction worker	21 (87.5)	3 (12.5)		
Dependent	21 (87.5)	3 (12.5)		
Other	16 (94.1)	1 (5.9)		
Working status (n=432)			0.052	0.773 (Fisher's)
With work permit	357 (91.3)	34 (8.7)		
Without work permit	37 (90.2)	4 (9.8)		
Duration of living in Thailand(n=427)			5.904	0.015 *
2 weeks to 1 year	42 (82.4)	9 (17.6)		
Above 1 year	348 (92.6)	28 (7.4)		
Ethnicity (n=433)			13.515	0.026*(Fisher's)
Burmese	216 (93.5)	15 (6.5)		
Mon	16 (88.9)	2 (11.1)		
Rakhine	97 (92.4)	8 (7.6)		
Kayin	25 (83.3)	5 (16.7)		
Shan	13 (100.0)	0 (0)		
Other	28 (77.8)	8 (22.2)		

***** Statistically significant

Table 14: Relationship between socio demographic characteristics and awareness of gestational diabetes (HEGDM means "Have you ever heard of gestational diabetes?")

Socio-demographic characteristics	HEGDM		Chi Square	p value
	Yes Number (%)	No Number (%)		
Age(years) (n=413)			11.094	0.004 *
18-30	87 (33.3)	174 (66.7)		
31-44	65 (47.1)	73 (52.9)		
≥44	9 (64.3)	5 (35.7)		
Gender (n=422)			0.573	0.449
Male	104(38.2)	168 (61.8)		
Female	63 (42.0)	87 (58.0)		
Marital status (n=418)			1.659	0.883(Fisher's)
Single	54 (40.6)	79 (59.4)		
Married	107(38.8)	169 (61.2)		
Divorced	2 (50.0)	2 (50.0)		
Widowed	0 (0)	2 (100.0)		
Separated	1 (33.3)	2 (66.7)		
Education (n=418)			4.403	0.495(Fisher's)
Can read and write (Never attended the school)	10 (45.5)	12 (54.5)		
Primary school level	44 (36.1)	78 (63.9)		
Middle school level	62 (38.5)	99 (61.5)		
High school level	38 (39.6)	58 (60.4)		
University	9 (56.3)	7 (43.8)		
Other	1 (100.0)	0 (0)		
Occupation (n=418)			3.673	0.299
Factory worker	145(41.1)	208 (58.9)		
Construction worker	7 (29.2)	17 (70.8)		
Dependent	6 (25.0)	18 (75.0)		
Other	6 (35.3)	11 (64.7)		

* Statistically significant

Table 14: (Continued) Relationship between socio demographic characteristics and awareness of gestational diabetes (HEGDM means have you ever heard of gestational diabetes.)

Socio-demographic characteristic	HEGDM		Chi Square	p value
	Yes Number (%)	No Number (%)		
Working status (n=417)			5.609	0.018 *
With work permit	154 (41.0)	222 (59.0)		
Without work permit	9 (22.0)	32 (78.0)		
Duration of living in Thailand (n=412)			2.037	0.154
2 weeks to 1 year	14 (29.2)	34 (70.8)		
Above 1 year	145 (39.8)	219 (60.2)		
Ethnicity(n=418)			3.884	0.597 (Fisher's)
Burmese	93 (42.7)	125 (57.3)		
Mon	6 (35.3)	11 (64.7)		
Rakhine	39 (37.5)	65 (62.5)		
Kayin	12 (40.0)	18 (60.0)		
Shan	3 (23.1)	10 (76.9)		
Other	11 (30.6)	25 (69.4)		

***** Statistically significant

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Table 15: Relationship between socio-demographic characteristics and awareness to realize whether having diabetes mellitus or not (DMH means "According to medical check-up, have you ever been told by a medical doctor that you have diabetes mellitus?")

Socio-demographic characteristics	DMH			Chi square	p value
	Yes Number (%)	No Number (%)	Don't know Number (%)		
Age(years)(n=422)				2.186	0.469
18-30	2 (0.7)	248 (29.2)	19 (7.1)		(Fisher's)
31-44	1 (0.7)	134 (95.7)	5 (3.6)		
≥44	0 (0)	12 (92.3)	1 (7.7)		
Gender(n=431)				2.425	0.243
Male	2 (0.7)	261 (92.2)	20 (71.1)		(Fisher's)
Female	1 (0.7)	142 (95.9)	5 (3.4)		
Marital status(n=427)				2.51	0.667
Single	2 (1.4)	132 (93.6)	7 (5.0)		(Fisher's)
Married	1 (0.4)	258 (93.1)	18 (6.5)		
Divorced	0 (0)	4 (100.0)	0 (0)		
Widowed	0 (0)	2 (100.0)	0 (0)		
Separated	0 (0)	3 (100.0)	0 (0)		
Education(n=427)				7.163	0.558
Can read and write (Never attended the school)	0 (0)	20 (100.0)	0 (0)		(Fisher's)
Primary school level	0 (0)	121 (96.0)	5 (4.0)		
Middle school level	1 (0.6)	155 (92.8)	11 (6.6)		
High school level	2 (2.1)	87 (89.7)	8 (8.2)		
University	0 (0)	15 (93.8)	1 (6.3)		
Other	0 (0)	1 (100.0)	0 (0)		

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Table 15: (Continued) Relationship between socio-demographic characteristics and awareness to realize whether having diabetes mellitus or not (DMH means "According to medical check-up, have you ever been told by a medical doctor that you have diabetes mellitus?")

Socio-demographic characteristics	DMH			Chi square	p value
	Yes Number (%)	No Number (%)	Don't know Number (%)		
Occupation (n=427)				4.892	0.478 (Fisher's)
Factory worker	2 (0.6)	339 (93.6)	21 (5.8)		
Construction worker	0 (0)	22 (91.7)	2 (8.3)		
Dependent	1 (4.2)	22 (91.7)	1 (4.2)		
Other	0 (0)	16 (94.1)	1 (5.9)		
Working status (n=426)				1.312	0.627 (Fisher's)
With work permit	3(0.8)	358 (93.0)	24 (6.2)		
Without work permit	0 (0)	40 (97.6)	1 (2.4)		
Duration of living in Thailand (n=422)				1.284	0.392 (Fisher's)
2 weeks to 1 year	1 (2.0)	47 (92.2)	3 (5.9)		
Above 1 year	2 (0.5)	347 (93.5)	22 (5.9)		
Ethnicity(n=427)				23.23	0.033* (Fisher's)
Burmese	1 (0.4)	217 (95.6)	9 (4.0)		
Mon	1 (5.6)	16 (88.9)	1 (5.6)		
Rakhine	1 (1.0)	96 (92.3)	7 (6.7)		
Kayin	0 (0)	28 (93.3)	2 (6.7)		
Shan	0 (0)	9 (69.2)	4 (30.8)		
Other	0 (0)	33 (94.3)	2 (5.7)		

***** Statistically significant

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4.8 Relationship between socio-demographic characteristics and presence of risk factors for diabetes mellitus

Association between socio-demographic characteristics and presence or absence of risk factors for diabetes mellitus was done using the Chi square analysis. History of gestational diabetes, BMI, status of smoking and history of hypertension were assessed as the risk factors for diabetes mellitus. There are no associations of any of the socio demographic characteristics with history of gestational diabetes and family history of diabetes. There are associations between BMI with age ($p=0.033$), marital status ($p=0.018$) and ethnicity ($p=0.03$). There are associations between smoking status and gender ($p<0.001$); smoking status and occupation ($p=0.015$); and smoking status and ethnicity ($p=0.002$). There are associations between hypertension history and age ($p<0.001$); and hypertension history and marital status ($p=0.004$). The chi square tables which show at least one statistical significance are described below.

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Table 16 : Relationship between socio-demographic characteristics and BMI

Socio-demographic characteristics	BMI				Chi square	p value
	Below normal	Within normal	Overweight	Obese		
	No. (%)	No. (%)	No. (%)	No. (%)		
Age(years) (n=414)					19.779	0.033 * (Fisher's)
18-30	37(14.0)	201(76.1)	24 (9.1)	2(0.8)		
31-43	17(12.4)	97 (70.8)	20 (14.6)	3(2.2)		
≥44	1 (7.7)	8 (61.5)	2 (15.4)	2(15.4)		
Gender (n=421)					3.257	0.332 (Fisher's)
Male	36(13.0)	211(76.4)	25 (9.1)	4 (1.4)		
Female	19(13.1)	102(70.3)	21 (14.5)	3 (2.1)		
Marital status (n=419)					20.877	0.018* (Fisher's)
Single	24(17.4)	108(78.3)	6 (4.3)	0 (0)		
Married	30(11.0)	195(71.7)	40 (14.7)	7 (2.6)		
Divorced	0 (0)	4 (100.0)	0 (0)	0 (0)		
Widowed	1 (50.0)	1 (50.0)	0 (0)	0 (0)		
Separated	0 (0)	3 (100.0)	0 (0)	0 (0)		

* Statistically significant

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Table 16: (Continued) Relationship between socio-demographic characteristics and BMI

Socio-demographic characteristics	BMI				Chi square	p value
	Below normal	Within normal	Overweight	Obese		
	No. (%)	No. (%)	No. (%)	No. (%)		
Education (n=419)					9.707	0..779 (Fisher's)
Can read and write, never attended the school	2 (10.0)	13 (65.7)	5 (25.0)	0 (0)		
Primary school level	20(16.1)	87 (70.2)	13 (10.5)	4(3.2)		
Middle school level	19(11.7)	126 (77.3)	16 (9.8)	2(1.2)		
High school level	11(11.6)	73 (76.8)	10 (10.5)	1(1.1)		
University level	3 (18.8)	11 (68.8)	2 (12.5)	0 (0)		
Other	0 (0)	1 (100)	0 (0)	0 (0)		
Occupation (n=419)					11.283	0.253 (Fisher's)
Factory worker	48(13.5)	262(73.8)	39 (11.0)	6(1.7)		
Construction worker	1 (4.2)	19 (79.2)	4 (16.7)	0 (0)		
Dependent	6 (26.1)	15 (65.2)	2 (8.7)	0 (0)		
Other	0 (0)	15 (88.2)	1 (5.9)	1(5.9)		
Working status (n=418)					3.72	0.366 (Fisher's)
With work permit	47(12.5)	279(74.0)	44 (11.7)	7(1.9)		
Without work permit	8 (14.5)	31 (75.6)	2 (4.9)	0 (0)		

Table 16: (Continued) Relationship between socio-demographic characteristics and BMI

Socio-demographic characteristics	BMI				Chi square	p value
	Below normal	Within normal	Over weight	Obese		
	No. (%)	No. (%)	No. (%)	No. (%)		
Duration of living In Thailand (n=415)					4.227	0.337 (Fisher's)
2 weeks to 1 year	4 (8.2)	42 (85.7)	3 (6.1)	2(3.9)		
Above 1 year	51(14)	264(72.5)	42(11.5)	7(1.9)		
Ethnicity(n=419)					27.65	0.03* (Fisher's)
Burmese	27(11.9)	174 (77)	24(10.6)	1(0.4)		
Mon	3 (16.7)	10 (55.6)	3 (16.7)	2(11.1)		
Rakhine	13 (13)	75 (75)	10 (10)	2 (2)		
Kayin	3 (10.3)	22 (75.9)	4 (13.8)	0 (0)		
Shan	0 (0)	9 (69.2)	3 (23.1)	1 (7.7)		
Other	9 (27.3)	21 (63.6)	2 (6.1)	1 (3)		

* Statistically significant

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Table 17: Relationship between socio-demographic characteristics and smoking status

Socio-demographic characteristics	Smoking			Chi square	p value
	Yes No. (%)	No No. (%)	Quit No. (%)		
Age(years) (n=425)				4.33	0.248 (Fisher's)
18-30	81(29.9)	182 (67.2)	8 (3.0)		
31-44	50(35.7)	82 (58.6)	8 (5.7)		
≥44	5 (35.7)	8 (57.1)	1 (7.1)		
Gender (n=433)				92.551	<0.001 *
Male	137(48.2)	135 (47.5)	12 (4.2)		
Female	5 (3.4)	139 (93.3)	5 (3.4)		
Marital status (n=430)				17.885	0.118 (Fisher's)
Single	53 (37.6)	84 (59.6)	4 (2.8)		
Married	58 (30.4)	183 (65.4)	12 (4.3)		
Divorced	0 (0)	4 (100.0)	0 (0)		
Widowed	0 (0)	1 (50.0)	1 (50.0)		
Separated	2 (66.7)	1 (33.3)	0 (0)		
Education (n=430)				7.933	0.430 (Fisher's)
Can read and write (Never attended the school)	6 (27.3)	14 (63.6)	2 (9.1)		
Primary school level	40 (32.0)	80 (64.0)	5 (4.0)		
Middle school level	50 (29.8)	114 (67.9)	4 (2.4)		
High school level	37 (37.8)	56 (57.1)	5 (5.1)		
University	6 (37.5)	9 (56.3)	1 (6.3)		
Other	1 (100.0)	0 (0)	0 (0)		
Occupation (n=430)				14.363	0.015 * (Fisher's)
Factory worker	127(34.8)	225 (61.3)	3 (3.6)		
Construction worker	8 (33.3)	14 (58.3)	2 (8.3)		
Dependent	2 (8.3)	22 (91.7)	0 (0)		
Other	3 (17.6)	12 (70.6)	2 (11.8)		

* Statistically significant

Table 17: (Continued) Relationship between socio-demographic characteristics and smoking status

Socio-demographic characteristics	Smoking			Chi square	p value
	Yes No. (%)	No No. (%)	Quit No. (%)		
Working status (n=429)				1.059	0.716
With work permit	128 (33.0)	244 (62.9)	16 (4.1)		(Fisher's)
Without work permit	11 (26.8)	29 (70.7)	1 (2.4)		
Duration of living in Thailand(n=425)				3.176	0.227
2 weeks to 1 year	128 (33.0)	244 (62.9)	16 (4.1)		(Fisher's)
Above 1 year	11 (26.8)	29 (70.7)	1 (2.4)		
Ethnicity(n=430)					
Burmese	67 (29.1)	156 (67.8)	7 (3.0)	27.115	0.002 *
Mon	4 (23.5)	13 (76.5)	0 (0)		(Fisher's)
Rakhine	49 (46.7)	50 (47.6)	6 (5.7)		
Kayin	6 (20.0)	23 (76.7)	1 (3.3)		
Shan	8 (61.5)	4 (30.8)	1 (7.7)		
Other	6 (17.1)	22 (77.1)	2 (5.7)		

* Statistically significant

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Table 18: Relationship between socio-demographic characteristics and hypertension

Socio-demographic characteristics	Hypertension			Chi square	p value
	Yes No. (%)	No No. (%)	Don't know No. (%)		
Age(years) (n=426)				33.523	<0.001 * (Fisher's)
18-30	25(9.2)	233 (86.6)	13 (4.8)		
31-44	12 (8.5)	123 (87.2)	6 (4.3)		
≥44	8 (37.1)	6 (42.9)	0 (0)		
Gender (n=434)				2.545	0.28
Male	26 (9.1)	244 (85.6)	15 (5.3)		
Female	20(13.4)	124 (83.2)	5 (3.4)		
Marital status (n=431)				22.756	0.004 * (Fisher's)
Single	6 (4.3)	124 (87.9)	11 (7.8)		
Married	38(13.5)	235 (83.6)	8 (2.8)		
Divorced	0 (0)	4 (100)	0 (0)		
Widowed	1 (50)	1 (50)	0 (0)		
Separated	0 (0)	2 (66.7)	1 (33.3)		
Education (n=431)				13.822	0.098 (Fisher's)
Can read and write (Never attended the school)	4 (18.2)	18 (81.8)	0 (0)		
Primary school level	12 (9.5)	112 (82.9)	2 (1.6)		
Middle school level	23(13.7)	135 (80.4)	10 (6)		
High school level	5 (5.1)	87 (88.8)	6 (6.1)		
University	1 (6.3)	13 (81.3)	2 (12.5)		
Other	0 (0)	1 (100)	0 (0)		
Occupation (n=431)				11.5	0.1 (Fisher's)
Factory worker	32 (8.7)	314 (85.8)	20 (5.5)		
Construction worker	4 (16.7)	20 (83.3)	0 (0)		
Dependent	6 (25)	18 (75)	0 (0)		
Other	3 (17.6)	14 (82.4)	0 (0)		

* Statistically significant

Table 18: (Continued) Relationship between socio-demographic characteristics and hypertension

Socio-demographic characteristics	Hypertension			Chi square	p value
	Yes No. (%)	No No. (%)	Don't know No. (%)		
Working status (n=430)				0.525	0.937 (Fisher's)
With work permit	40 (10.3)	330 (84.8)	19 (4.9)		
Without work permit	4 (9.8)	36 (87.8)	1 (2.4)		
Duration of living in Thailand(n=426)				0.965	0.516 (Fisher's)
2 weeks to 1 year	7 (13.7)	41 (80.4)	3 (5.9)		
Above 1 year	37 (9.9)	321 (85.6)	17 (45.0)		
Ethnicity(n=431)				17.377	0.064 (Fisher's)
Burmese	24 (10.4)	192 (83.5)	14 (6.1)		
Mon	4 (23.5)	13 (76.5)	0 (0)		
Rakhine	6 (5.7)	96 (91.4)	3 (2.9)		
Kayin	2 (6.7)	27 (90.0)	1 (3.3)		
Shan	2 (15.4)	9 (69.2)	2 (15.4)		
Other	7 (19.4)	29 (80.6)	0 (0)		

4.9 Relationship between socio-demographic characteristics and knowledge, attitude and practice scores.

Relationship between socio-demographic characteristics and knowledge, attitude and practice scores was calculated using Chi square. There are associations of gender, education, status of having work permit or not, duration of living in Thailand with knowledge scores. Most of the socio-demographic characteristics and attitude scores are not associated except for work permit status. There are associations between practice scores for all respondents and gender, marital status, occupation, work permit status, duration of living in Thailand and ethnicity. Chi square tables which show at least one statistical significance are shown below.

Table 19: Relationship between socio-demographic characteristics and knowledge scores

Socio-demographic characteristics	Knowledge score			Chi square	p value
	Poor No. (%)	Moderate No. (%)	Good No. (%)		
Age(years) (n=427)				1.964	0.598
18-30	11 (73.3)	46 (66.7)	215 (62.7)		(Fisher's)
31-44	3 (20.0)	21 (30.4)	117 (34.1)		
≥44	1 (6.7)	2 (2.9)	11 (3.2)		
Gender (n=436)				7.722	0.021 *
Male	9 (3.1)	56 (19.6)	221 (77.3)		
Female	6 (4.0)	14 (9.3)	130 (86.7)		
Marital status (n=432)				3.262	0.585
Single	6 (4.2)	21 (14.7)	116 (81.1)		(Fisher's)
Married	9 (3.2)	46 (16.4)	225 (80.4)		
Divorced	0 (0)	1 (25.0)	3 (75.0)		
Widowed	0 (0)	1 (50.0)	1 (50.0)		
Separated	0 (0)	1 (33.3)	2 (66.7)		
Education (n=432)				24.939	0.018 *
Can read and write (Never attended the school)	4 (18.2)	3 (13.6)	15 (68.2)		(Fisher's)
Primary school level	6 (4.8)	15 (11.9)	105 (83.3)		
Middle school level	2 (1.2)	25 (14.9)	141 (83.9)		
High school level	3 (3.0)	24 (24.2)	72 (72.7)		
University	0 (0)	3 (18.8)	13 (81.3)		
Other	0 (0)	0 (0)	1 (100.0)		

* Statistically significant

Table 19: (Continued) Relationship between socio-demographic characteristics and knowledge scores

Socio-demographic characteristics	Knowledge scores			Chi square	p value
	Poor No. (%)	Moderate No. (%)	Good No. (%)		
Occupation (n=432)				8.362	0.265 (Fisher's)
Factory worker	11 (3.0)	61 (16.6)	296 (80.4)		
Construction worker	1 (4.3)	2 (8.7)	20 (87.0)		
Dependent	3 (12.5)	3 (12.5)	18 (75.0)		
Other	0 (0)	4 (23.5)	13 (76.5)		
Working status (n=431)				14.669	0.001 * (Fisher's)
With work permit	11 (2.8)	57 (14.6)	322 (82.6)		
Without work permit	4 (9.8)	13 (31.7)	24 (58.5)		
Duration of living in Thailand(n=426)				7.406	0.025 *
2 weeks to 1 year	5 (10.0)	6 (12.0)	39 (78.0)		
Above one year	10 (2.7)	63 (16.8)	303 (80.6)		
Ethnicity(n=432)				10.84	0.284 (Fisher's)
Burmese	7 (3.0)	46 (19.9)	178 (77.1)		
Mon	1 (5.6)	3 (16.7)	14 (77.8)		
Rakhine	2 (1.9)	11 (10.5)	92 (87.6)		
Kayin	2 (6.7)	4 (13.3)	24 (80.0)		
Shan	0 (0)	2 (15.4)	11 (84.6)		
Other	3 (8.6)	4 (11.4)	28 (80.0)		

* Statistically significant

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Table 20: Relationship between socio-demographic characteristics and attitude scores

Socio-demographic characteristics	Attitude scores			Chi square	p value
	Poor	Moderately positive	Good		
	No. (%)	No. (%)	No. (%)		
Age(years) (n=427)				6.663	0.195 (Fisher's)
18-30	79(29.0)	143 (52.6)	50 (18.4)		
31-44	34(24.1)	72 (51.1)	35 (24.8)		
≥44	2 (1.7)	11 (4.9)	1 (1.2)		
Gender (n=436)				1.814	0.404
Male	79(27.6)	154 (53.8)	53 (185.0)		
Female	39(26.0)	75 (50.0)	36 (24.0)		
Marital status (n=432)				4.007	0.828 (Fisher's)
Single	40 (28)	77 (53.8)	26 (18.2)		
Married	75(26.8)	146 (52.1)	59 (21.1)		
Divorced	2 (50.0)	2 (50.0)	0 (0)		
Widowed	0 (0)	1 (50.0)	1 (50.0)		
Separated	1 (33.3)	1 (33.3)	1 (33.3)		
Education (n=432)				15.913	0.145 (Fisher's)
Can read and write (Never attended the school)	5 (22.7)	15 (68.2)	2 (9.1)		
Primary school level	35 (27.8)	69 (54.8)	22 (17.5)		
Middle school level	44 (26.2)	87 (51.8)	37 (22.0)		
High school level	29 (29.3)	52 (52.5)	18 (18.2)		
University	4 (25.0)	4 (25.0)	8 (50.0)		
Other	1 (100.0)	0 (0)	0 (0)		

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Table 20: (Continued) Relationship between socio-demographic characteristics and attitude scores

Socio-demographic characteristics	Attitude scores			Chi square	p value
	Poor	Moderately positive	Good		
	No. (%)	No. (%)	No. (%)		
Occupation (n=432)				6.104	0.41 (Fisher's)
Factory worker	100 (27.2)	194 (52.7)	74(20.1)		
Construction worker	6 (26.1)	14 (60.9)	3 (13.0)		
Dependent	10 (41.7)	9 (37.5)	5 (20.8)		
Other	2 (11.8)	10 (58.8)	5 (29.4)		
Working status (n=431)				8.352	0.015 * (Fisher's)
With work permit	100 (25.6)	206 (52.8)	84(21.5)		
Without work permit	18 (43.9)	20 (48.8)	3 (7.3)		
Duration of living in Thailand(n=426)				1.139	0.566
2 weeks to 1 year	17 (34.0)	24 (48.0)	9 (18.0)		
Above 1 year	101 (26.9)	197 (52.4)	78(20.7)		
Ethnicity(n=432)				12.285	0.277 (Fisher's)
Burmese	68 (29.4)	124 (53.7)	39(16.9)		
Mon	6 (33.3)	6 (33.3)	6 (33.3)		
Rakhine	5 (23.8)	56 (53.3)	24(22.9)		
Kayin	7 (23.3)	17 (56.7)	6 (20.0)		
Shan	2 (15.4)	10 (76.9)	1 (7.7)		
Other	10 (28.6)	14 (40.0)	11(31.4)		

* Statistically significant

Table 21: Relationship between socio-demographic characteristics and practice scores.

Socio-demographic characteristics	Practice scores			Chi square	p value
	Poor	Moderate	Good		
	No. (%)	No. (%)	No. (%)		
Age(years) (n=434)				3.933	0.415
18-30	110(46.6)	61 (22.5)	100 (36.9)		
31-44	69 (49.3)	24 (17.1)	47 (33.6)		
≥44	8 (34.8)	6 (26.1)	9 (39.1)		
Gender (n=434)				17.953	<0.001*
Male	102 (35.9)	64 (22.5)	118 (41.5)		
Female	85 (56.7)	27 (18.0)	38 (25.3)		
Marital status (n=430)				18.662	0.007 * (Fisher's)
Single	49 (34.5)	37 (26.1)	56 (39.4)		
Married	134 (48.0)	51 (18.3)	94 (33.7)		
Divorced	0 (0)	2 (50.0)	2 (50.0)		
Widowed	0 (0)	0 (0)	2 (100.0)		
Separated	3 (100.0)	0 (0)	0 (0)		
Education (n=430)				6.358	0.811 (Fisher's)
Can read and write (Never attended the school)	10 (45.5)	6 (27.3)	6 (27.3)		
Primary school level	61 (48.4)	26 (20.6)	39 (31.0)		
Middle school level	69 (41.3)	36 (21.6)	62 (37.1)		
High school level	39 (39.8)	20 (20.4)	39 (39.8)		
University level	6 (37.5)	2 (12.5)	8 (50)		
Other	1 (100.0)	0 (0)	0 (0)		

***** Statistically significant

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Table 21: (Continued) Relationship between socio-demographic characteristics and practice scores

Socio-demographic characteristics	Practice scores			Chi square	p value
	Poor No. (%)	Moderate No. (%)	Good No. (%)		
Occupation (n=430)				21.175	0.001 * (Fisher's)
Factory worker	157 (42.9)	77 (21.0)	132 (36.1)		
Construction worker	6 (26.1)	1 (4.3)	16 (69.6)		
Dependent	15 (62.5)	7 (29.2)	2 (8.3)		
Other	8 (47.1)	5 (29.4)	4 (23.5)		
Working status (n=429)				12.313	0.002 *
With work permit	159 (41.0)	81 (20.9)	148 (38.1)		
Without work permit	27 (65.9)	9 (22.0)	5 (12.2)		
Duration of living in Thailand(n=424)				8.024	0.018 *
2 weeks to 1 year	16 (32.0)	18 (36.0)	16 (32.0)		
Above 1 year	169 (45.2)	71 (19.0)	134 (35.8)		
Ethnicity(n=430)				18.27	0.044* (Fisher's)
Burmese	101 (44.1)	53 (23.1)	75 (32.8)		
Mon	6 (33.3)	7 (38.9)	5 (27.8)		
Rakhine	40 (38.1)	14 (13.3)	51 (48.6)		
Kayin	14 (46.7)	8 (26.7)	8 (26.7)		
Shan	5 (38.5)	4 (30.8)	4 (30.8)		
Other	20 (57.1)	4 (11.4)	11 (31.4)		

***** Statistically significant

4.10 Relationship between knowledge, attitudes and practices regarding diabetes mellitus

Relationship between knowledge, attitude and practice scores were calculated using Chi square. There are associations of knowledge with attitude and practice scores for all respondents. There is an association between attitude and practice scores for all respondents.

Table 22: Relationship between knowledge and attitudes regarding diabetes mellitus

	Attitude scores			Chi square	p value
	Poor	Moderately positive	Good		
	No. (%)	No. (%)	No (%)		
Knowledge scores(n=436)				53.612	<0.001 * (Fisher's)
Poor	12(80.0)	2 (13.3)	1 (6.7)		
Moderate	35(50.0)	32 (45.7)	3 (4.3)		
Good	71(20.2)	195 (55.6)	85 (24.2)		

***** Statistically significant

Table 23: Relationship between knowledge and practices regarding diabetes mellitus

	Practice scores			Chi square	p value
	Poor	Moderate	Good		
	No. (%)	No. (%)	No. (%)		
Knowledge scores(n=434)				21.56	<0.001 * (Fisher's)
Poor	10 (66.7)	4 (26.7)	1 (6.7)		
Moderate	44 (63.8)	9 (1.3)	16 (23.2)		
Good	133 (38.0)	78 (22.3)	139 (39.7)		

***** Statistically significant

Table 24: Relationship between attitudes and practices regarding diabetes mellitus

	Practice scores			Chi square	p value
	Poor No. (%)	Moderate No. (%)	Good No. (%)		
Attitude scores(n=434)				11.936	0.018*
Poor	54 (46.2)	29 (24.8)	34 (29.1)		
Moderately positive	91 (39.9)	54 (23.7)	83 (36.4)		
Good	42 (47.2)	8 (9.0)	39 (43.8)		

***** Statistically significant

4.11 Bivariate analysis between risk factors with knowledge, attitude and practice

Regression analysis between presence of risk factors with knowledge, attitude and practice was done and there is no statistical significance for all bivariate analyses.

Part III Multivariate analysis

Multivariate analysis is done using ordinary least squares regression methods, linear regression when dependent variables are continuous, and logistic regression when dependent variables are dichotomous. Some variables were modified into continuous or classifications (expressed as dummy variables). The actual BMI, knowledge, attitude and practice scores are used directly as the continuous variables.

4.12 Relationship between socio-demographic characteristics and indexes of awareness of diabetes mellitus

Tables 25 and 26 show the relationship between socio-demographic characteristics and awareness of diabetes mellitus and gestational diabetes. There is an association between awareness of diabetes mellitus and duration of living in Thailand (p=0.02) showing that those who live more than one year in Thailand are more aware of diabetes mellitus. This is so even though respondent's age is controlled There is an association between the awareness of gestational diabetes and age (p=0.002) and the respondents below 31 year of age are found to be less aware of gestational diabetes than the older age groups. As in bivariate analysis, there are no associations between awareness of insulin and any

of the socio-demographic characteristics. Also there is no association between awareness of whether having diabetes mellitus or not and any of the socio-demographic characteristics.

Table 25: Regression analysis of relationship between socio-demographic characteristics and awareness of diabetes mellitus (Have you ever heard of diabetes mellitus?)

Socio-demographic characteristics	B	p value	Odds ratio	95% Confidence Interval
Duration of living in Thailand				
2 weeks to 1 year(ref)				
Above 1 year	1.116	0.02 *	5.373	1.108-7.837

* Statistically significant

The equation also included age groups, gender, marital status, education, occupation, status of having work permit or not and ethnicity. These are insignificant in this equation and therefore are not presented.

Table 26: Regression analysis of relationship between socio-demographic characteristics and awareness of gestational diabetes (Have you ever heard of gestational diabetes?)

Socio-demographic characteristics	B	p value	Odds ratio	95% Confidence Interval
Age(years)				
18-30(ref)		0.002 *		
31-43	0.665	0.008 *	1.925	1.187-3.122
≥44	1.745	0.006 *	5.728	1.657-19.802

* Statistically significant

The equation also included gender, marital status, education, occupation, status of having work permit or not, duration of living in Thailand and ethnicity. These are insignificant in this equation and therefore are not presented.

4.13 Regression analysis of the relationships between socio-demographic characteristics and presence of risk factors regarding diabetes mellitus

Tables 27, 28 and 29 show the regression between socio-demographic characteristics and the presence of risk factors regarding diabetes mellitus. There is no association between any of the socio-demographic characteristics and the presence of gestational diabetes. There is an association between family history of diabetes mellitus and duration of living in Thailand showing that people who have been living in Thailand more than one year have negative association with family history of diabetes (p=0.034). There is an association between gender and smoking status showing that males tend to

smoke more than females. (p<0.001).Respondents who have been living in Thailand above one year also have the negative association with the smoking (p=0.027). Age is associated with presence of hypertension (p<0.001) showing people who are above the age of 43 are more associated with presence of hypertension. (p<0.001) than those who are younger than 31 years of age. There are associations between age and BMI (p=0.005) showing that the respondents of equal or more than 44 years of age tend to have more BMI than the other two age groups (p=0.046). The respondents who are married tend to have more BMI than those who are single (p=0.031).Working status has overall statistical significance in relation to BMI but not significant for each subset within the variable after multiple linear regression. Ethnicity also have association with BMI (p=0.016) and Shan ethnic group has more BMI compared to Burmese (p=0.05) and the ethnic groups which are labelled as other tend to have less BMI compared to Burmese (p=0.004).Some p values are described as the results of linear regression calculated for each variable separately. Those p values are marked as "i".

Table 27: Regression analysis of relationship between socio-demographic characteristics and family history of diabetes mellitus

Socio-demographic characteristics	B	p value	Odds ratio	95% Confidence Interval
Duration of living in Thailand 2 weeks to 1 year (ref.)				
Above 1 year	-0.843	0.043 *	0.431	0.191-0.973

***** Statistically significant

The equation also included age groups, gender, marital status, education, occupation, status of having work permit or not and ethnicity. These are insignificant in this equation and therefore are not presented.

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Table 28: Regression analysis of relationship between socio-demographic characteristics and smoking

Socio-demographic characteristics	B	p value	Odds ratio	95% Confidence Interval
Gender				
Female(ref.)				
Male	3.290	<0.001*	26.841	10.681-67.452
Duration of living in Thailand				
2 weeks to one year(ref.)				
More than one year	-0.871	0.027*	0.418	0.193-0.905

* Statistically significant

The equation also included age groups, marital status, education, occupation, status of having work permit or not and ethnicity. These are insignificant in this equation and therefore are not presented.

Table 29: Regression analysis of relationship between socio-demographic characteristics and hypertension

Socio-demographic characteristics	B	p value	Odds ratio	95% Confidence Interval
Age (years)				
18-30(ref.)		<0.001 *		
31-43	-0.537	0.21	0.584	0.252-1.353
≥44	2.59	<0.001 *	13.330	3.254-54.607

* Statistically significant

The equation also included gender, marital status, education, occupation, status of having work permit or not, duration of living in Thailand and ethnicity. These are insignificant in this equation and therefore are not presented.

Table 30: Regression analysis between socio-demographic characteristics and BMI

Socio-demographic characteristics	B	p value	95% Confidence interval
Age(years)		0.005 *(i)	
18-30(ref.)			
31-43	0.621	0.061	-0.028-1.270
≥44	1.738	0.046 *	0.023-3.446
Marital status		0.012 *(i)	
Single(ref.)			
Married	0.744	0.031 *	0.069-1.420
Divorced	-0.064	0.966	-2.933-2.864
Widowed	-0.676	0.748	-4.805-3.452
Separated	-1.185	0.496	-4.605-2.236
Working status		0.017 *(i)	
With work permit(ref.)			
Without work permit	-0.926	0.069	-1.925-0.073
Ethnicity		0.016 *(i)	
Burmese(ref.)			
Mon	0.84	0.249	-0.589-2.268
Rakhine	-0.061	0.867	-0.782-0.659
Kayin	0.127	0.827	-1.013-1.266
Shan	2.358	0.005 *	0.729-3.989
Other	-1.146	0.04*	-2.243-0.05

*Statistically significant, "i" - p value resulted from regression analysis of each individual variables and not from multivariate regression of all variables.

The equation also included gender, education, occupation and duration of living in Thailand. These are insignificant in this equation and therefore are not presented. Some p values are described as the results of linear regression calculated for each variable separately. Those p values are marked as (i).

4.14 Regression analysis between socio-demographic characteristics and knowledge, attitude and practice level regarding diabetes mellitus

Tables 31, 32 and 33 show the regression analysis between socio-demographic characteristics and knowledge, attitude and practice levels regarding diabetes mellitus. There is an association between respondents' education and knowledge level (p=0.026): the respondents with middle school level of education tend to have more knowledge level compared to those who never attended the school (p=0.038). There is an association between level of knowledge and status of having work permit or not (p<0.001) showing that the respondents without work permit tend to have less knowledge compared to those who have work permit. There is no association between gender and knowledge after calculating for individual independent variables. But after calculating multivariate analysis including all other variables, males tend to have less knowledge compared to females (p=0.027). Rakhine ethnic group has positive association with the level of knowledge (p=0.026). There is also an association between level of attitude and status of having work permit or not showing that those who have work permit have more positive attitude than the respondents without the work permit (0.017). Respondents with university level of education have positive association with the attitude (p=0.032). There is an association between gender and the practice level showing that males have better practice level than the females(p<0.001).Marital status and occupation have association with practice level on individual calculation. There is also an association between status of having work permit or not showing that the respondents without the work permit tend to have less practice score than those with the work permit (p<0.001). Rakhine ethnic group has positive association with the level of practice (p=0.023). Some p values are described as the results of linear regression calculated for each variable separately. Those p values are marked as (i).

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Table 31: Regression analysis between socio-demographic characteristics and knowledge

Socio-demographic characteristics	B	p value	95% Confidence interval
Gender		0.105(i)	
Female(ref.)			
Male	-1.620	0.027 *	-3.055-(-0.185)
Education		0.026* (i)	
Can read and write, never attended the school(ref.)			
Primary school level	1.909	0.180	-0.884-4.701
Middle school level	2.944	0.038 *	0.167-5.722
High school level	0.32	0.852	-2.645-3.285
University level	0.383	0.859	-3.852-4.617
Other	0.962	0.887	-16.157-10.129
Working status		<0.001*(i)	
With work permit (ref.)			
Without work permit	-4.355	<0.001*	-6.599-(-2.112)

* Statistically significant, i - p value resulted from regression analysis of each individual variables and not from multivariate regression including all variables.

The equation also include age groups, marital status, occupation duration of living in Thailand and ethnicity. These are insignificant in this equation and therefore are not presented.

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Table 31: (Continued) Regression analysis between socio-demographic characteristics and knowledge

Socio-demographic characteristics	B	p value	95% Confidence interval
Ethnicity		0.534 (i)	
Burmese(ref.)			
Mon	-0.534	0.745	-2.763-2.686
Rakhine	1.810	0.026 *	0.22-3.398
Kayin	0.256	0.842	-2.268-2.78
Shan	-0.466	0.803	-4.141-3.209
Other	-0.753	0.544	-3.19-1.683

* Statistically significant, i-p value resulted from regression analysis of each individual variables and not from multivariate regression including all variables.

The equation also included gender, marital status, occupation and duration of living in Thailand .These are insignificant in this equation and therefore are not presented.

Table 32: Regression analysis between socio-demographic characteristics and attitude

Socio-demographic characteristics	B	p value	95% Confidence interval
Education		0.27(i)	
Can read and write, never attended the school(ref)			
Primary school level	1.108	0.230	-0.703-2.918
Middle school level	1.233	0.179	-0.568-3.034
High school level	1.018	0.298	-0.904-2.941
University level	3.005	0.032 *	0.259-5.75
Other	-2.851	0.51	-113.72-5.67
Working status		0.009*(i)	
With work permit(ref)			
Without work permit	-1.771	0.017*	-3.226-(0.317)

***** Statistically significant, i- p value resulted from regression analysis of each individual variables and not from multivariate regression including all variables.

The equation also included age groups, gender, marital status, occupation, duration of living in Thailand and ethnicity. These are insignificant in this equation and therefore are not pr

Table 33: Regression analysis between socio-demographic characteristics and practice

Socio-demographic characteristics	B	p value	95% Confidence interval
Gender		<0.001*(i)	
Female(ref)			
Male	1.513	0.001*	0.586-2.439
Marital status		0.02*(i)	
Single(ref.)			
Married	-0.46	0.353	-1.432-0.512
Divorced	3.419	0.115	-0.84-7.678
Widowed	2.477	0.419	-3.537-8.491
Separated	-4.566	0.072	-9.535-0.403
Occupation		0.004*(i)	
Factory worker(ref.)			
Construction worker	1.148	0.233	-0.742-3.039
Dependent	-0.762	0.435	-2.680-1.156
Other	0.352	0.751	-1.837-2.544
Working status			
With work permit(ref)		<0.001*(i)	
Without work permit	-2.809	<0.001 *	-4.225- (-1.362)
Ethnicity		0.061(i)	
Burmese (ref.)			
Mon	1.745	0.099	-0.332-3.882
Rakhine	1.193	0.023 *	0.167-2.218
Kayin	0.269	0.746	-1.359-1.897
Shan	-0.114	0.925	-2.485-2.258
Other	-0.327	0.683	-1.899-1.245

* Statistically significant, i- p value resulted from regression analysis of each individual variables and not from multivariate regression including all variables. The equation also included age groups, education and duration of living in Thailand. These are insignificant in this equation and therefore are not presented.

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4.15 Regression analysis between knowledge, attitude and practice regarding diabetes mellitus

Associations of knowledge and attitude with practice level regarding diabetes mellitus were calculated followed by calculation of association of knowledge and attitude. First, the association of practice related to knowledge and attitude is calculated. Attitude has no significant association with practice while knowledge has positive association with practice. Knowledge has positive association with attitude. Then the associations between these variables are calculated again as multiple linear regression controlling other independent variables and that calculations also yield the same results. Tables 34 represents the results of linear regression between knowledge and attitude. Table 35 represents the results of linear regression of practice in relation to knowledge and attitude.

Table 34: Regression analysis between knowledge and attitude level regarding diabetes mellitus

	Attitude		
	B	p value	95% Confidence interval
Knowledge	0.271	<0.001 *	0.217-0.325

*****Statistically significant

The equation with controlling of other independent variables give the similar results as the above equation.

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Table 35: Regression analysis of practice by knowledge and attitude level regarding diabetes mellitus

	Practice		
	B	p value	95 % Confidence interval
Knowledge	0.158	<0.001 *	0.091-0.224
Attitude	-0.001	0.986	-0.110-0.108

*Statistically significant

The equation with controlling of other independent variables give the similar results as the above equation.

4.16 Regression analysis between risk factors with knowledge, attitude and practice regarding diabetes mellitus

Regression analysis between presence of risk factors with knowledge, attitude and practice was done and there is no statistical significance for all multivariate analyses

CHAPTER V
DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Discussion

This study was a cross-sectional descriptive and analytical study based on 437 respondents (286 males and 151 females). The main purpose of this study is to assess the knowledge, attitudes and practices regarding diabetes mellitus among Myanmar migrant workers in Bang Khun Thian district of Bangkok metropolitan area. The required sample size is 382. After adding 10 % of required sample size as drop-out rate it became 422. Although there was no drop-out respondent during the research process, some participants did not answer some questions. To cover the required sample size, another 15 respondents were added.

The study was done on Sundays only because the workers had to work on other six days of the week. So most of them did not give time to answer when they returned from work as they were already tired on the weekdays. So the time was very limited for this study. Some rooms of the apartments were small and not convenient for interview. So the research team had to choose such convenient places as canteens and playgrounds.

Bang Khun Thian district is a work place to many Myanmar migrant workers. After interviewing all respondents, just 3 respondents reported that they have diabetes mellitus according to the diagnosis by the medical doctor. The awareness level of diabetes mellitus among those worker varies but most of the participant have ever heard of that disease.

Socio-demographic characteristics

According to this study, most of the respondents are 18 to 30 years of age. The majority are male, married, middle school level of education, with work permit, factory workers who have been living in Thailand more than one year. As there are so many ethnic groups in Myanmar, various ethnic groups are observed among the study population. Most of the ethnic group are Burmese.

Awareness indexes of diabetes mellitus

In assessment of awareness level, although most of the respondents have ever heard of diabetes mellitus, most have not ever heard of gestational diabetes and insulin. Most of the respondents knew whether they have diabetes mellitus or not. Just 5.7 % of the respondents did not know whether they have diabetes mellitus or not.

Risk factors related to diabetes mellitus.

As the time was very limited, only some of the risks factor for diabetes mellitus could be assessed. Among the female participants who were pregnant, only 4 of them reported that they got gestational diabetes according to the diagnosis by the medical doctor. 62 respondents (14.2%) answered that they had the family history of diabetes mellitus. 71.6% of the respondents have the BMI within normal range. On assessment of smoking status, 32.5% were smokers. 10.5% of total respondents reported that they have hypertension according to the diagnosis by the medical doctor. The presence of risk factors for mellitus among the respondents were varied by their answers: most of the participants didn't have the risk factors for diabetes mellitus. For some questions, some respondents reported "Don't know" instead of "Yes" or "No". This made the research difficult to get correct answer regarding their awareness and presence of risk factors regarding diabetes mellitus. Most of the male smoke (48.2%) showing that although they have good level of knowledge score, they don't avoid the unhealthy behavior that might lead to prevalence of diabetes.

Knowledge regarding diabetes mellitus

The majority of the respondents got correct scores for positive statements. On the other hand, they failed to get correct score for negative statements. There was not so much difference between the number of respondents who told "Yes" to "Insulin deficiency as the cause of diabetes mellitus" and who told not sure to the same question. That means the respondents didn't know the cause of diabetes mellitus. 47.3 % of the male respondents and 39.2% of female respondents gave wrong answers for the statement "There are two types of diabetes mellitus". Most of the respondents gave correct answers for treatment, symptoms and complications regarding diabetes mellitus. The respondents still think that the diabetic foods are special rather than

controlled diet plan according to dieticians. The other distinguished misconception from the respondents is they still think that diabetes is raised sugar level in urine only and they didn't realize that it is the hyperglycemic state in the blood. Overall, most of the participants got "good" knowledge scores (77.3% of males and 86.1 % of females).

Attitudes towards diabetes mellitus

As in knowledge questions, most of the respondents got correct scores for positive statement with exception in negative statements. Most of the responses for all questions were "Agree" rather than "Strongly agree". The respondents still need to be educated that the management of diabetes mellitus is by the multidisciplinary approach which consists of lifestyle modifications and medications. Moreover, they still think that diabetes is common in rich people.

Practices regarding diabetes mellitus

Two sets of questionnaires were used to assess practices regarding diabetes mellitus: one for all respondents regarding preventive actions of diabetes mellitus and the other for diabetes patient. There were only 3 diabetes patient to answer the latter. So the comparison between these two questionnaires was rather impossible and the results for practice questions of diabetes patients are just described as the descriptive statistics. Most of the respondents got positive scores in practice questions. But by comparing the two genders, most of the female got moderate practice scores whereas their male counterparts got good practice scores.

Bivariate analysis

Association between socio-demographic characteristics and awareness level, risk factors, knowledge, attitudes and practices regarding diabetes mellitus were calculated. In bivariate analysis, the association between independent and dependent variables varied among each calculation. There are associations between awareness of diabetes mellitus and ethnicity (p=0.026), and duration of living in Thailand (p=0.015). There are association between awareness of gestational diabetes and age (p=0.004), and status of having work permit or not (p=0.018). There is no association between socio-

demographic characteristics and awareness of insulin. There is an association between awareness having diabetes mellitus or not and ethnicity (p=0.033).

There are no associations between socio-demographic characteristics and history of gestational diabetes, and family history of diabetes mellitus. There are associations between BMI and age (p=0.033), marital status (p=0.018) and ethnicity (p=0.031). There are associations between smoking and gender (p<0.001), occupation (p=0.015) and ethnicity (p=0.002). There are associations between hypertension history and age (p<0.001), and marital status (p=0.004).

There are associations between knowledge and gender (p=0.021), knowledge and educational status (p=0.018) and status of having work permit or not (p=0.001) and duration of living in Thailand (p=0.025).There are no associations between attitude level and most of socio-demographic characteristics except with the status of having work permit or not (p=0.015). There are associations between practice level of all respondents and gender (p<0.001), marital status (p=0.007), occupation (p=0.001), status of having work permit or not (p=0.002) and duration of living in Thailand. (p=0.018) and ethnicity (p=0.044).

In bivariate analysis there are associations between level of knowledge and level of attitudes (p=0.000), level of knowledge and practices (p=0.000), and level of attitudes and practices (p=0.018) regarding diabetes mellitus.

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Multivariate analysis

Multivariate analysis was done using the linear and logistic method. There is an association between awareness of diabetes mellitus and duration of living in Thailand (p=0.02). Age is found to be associated with awareness of gestational diabetes (p=0.002).

Associations between socio-demographic characteristics were assessed. There is no association between history of gestational diabetes and all socio-demographic characteristics. There is negative association between family history of diabetes mellitus and duration of living in Thailand (p=0.043). Males have positive association with smoking status (p<0.001). Duration of living in Thailand is also associated with smoking status (p<0.001). Age is found to be associated with the presence of hypertension (p< 0.001). Age is associated with BMI and people who are 44 years of

age and above tend to have more BMI than people who are under 31 years of age (p=0.046). Marital status also has association with BMI and married respondents tend to have more BMI than singles (p=0.031). Shan ethnic group have more BMI compared to Burmese (p=0.005) and the ethnic group which is labelled as other tends to have less BMI compared to Burmese (p=0.04). Respondents who don't have work permit have negative association with knowledge, attitude and practice with p-value of <0.001, 0.017 and <0.001. Males have negative association with knowledge level (p=0.027). Respondents who have middle school level of education have more knowledge compared to those who never attended the school (p=0.038). Rakhine ethnic group has positive association with knowledge (p=0.026). Respondents who have University level of education have positive association with attitude level (p=0.032). Males have positive association with practice compared to females (p=0.001). Rakhine ethnic group has positive association with practice level (p=0.023). There are associations between knowledge and attitude, and knowledge and practice. But there are no association of attitude and practice level.

5.2 Conclusion

The study was done to assess the knowledge, attitudes and practices regarding diabetes mellitus among Myanmar migrant workers in Bang Khun Thian district, Bangkok, Thailand. Although the prevalence of diabetes mellitus in Thailand and Myanmar are known, the actual prevalence of this disease among the Myanmar migrant populations in the study area was not known. So 50% prevalence is considered to cover for enough sample size. After interviewing all respondents, only 3 reported that they have diabetes mellitus according to the diagnosis by medical doctor. From remaining respondents, there may be missing cases of diabetes mellitus. This study only concerned on knowledge, attitudes and practices: to know the actual prevalence of diabetes mellitus, blood test is required.

Most of the people answered the questions enthusiastically. There were not so much problems in introducing the research team to each respondent before conducting the study. The problems that were encountered by the principal researcher are that some respondents missed to answer some questions and some research assistants missed to fill out some responses.

The data collection was done on 2015 May and June. It took 4 weeks to finish the research. The study was cross-sectional study which represents both descriptive and analytical inference. Questions regarding socio-demographic characteristics, awareness level and presence of some risk factors for diabetes mellitus were asked prior to the knowledge, attitudes and practices questionnaires. Chi square is used in analysis at bivariate level. Multiple linear regression and logistic regression methods are used in analysis at multivariate level. The data analysis was done using Statistical package for social science (SPSS) version 21.

According to the descriptive statistics, most of the respondents showed good level of knowledge, moderately positive level of attitudes and good level of practices regarding diabetes mellitus. Exception is clear only on the negative statements of the knowledge and attitude questionnaires to which most respondents gave wrong answer.

The statistical significances between socio-demographic characteristics, awareness, risk factors, knowledge, attitudes and practices regarding diabetes mellitus vary on bivariate and multivariate analysis. There are the presence of associations between knowledge, attitudes and practices regarding diabetes mellitus on bivariate analysis. On regression analysis, knowledge influences on attitude and practice. But there is no significant association between attitude and practice.

Asia constitutes more than 60% of global diabetic population. Socio-economic development and narrowing of urban rural difference make lifestyle disorders of the people in developing countries which in turn affect the health of those people. Asians have lower threshold for diabetes mellitus. People at younger age could have diabetes mellitus even with normal BMI and waist circumference. So comprehensive health care involving preventive and curative measures for diabetes mellitus crucial in health care of the developing countries. Health financing is inadequate and health care outcome is still unsatisfactory for diabetes mellitus in developing world. (Ramachandran et al., 2012)

Due to the migrant nature of the workers, they have limited health care and need more comprehensive healthcare. Non-communicable diseases should be equally emphasized as infectious diseases because of their increasing trend of prevalence in developing countries and all over the world. Since lifestyle modification is the important factor in prevention and control of diabetes mellitus, effective health

education is important to implement that modifications. People at working age have to know about the diabetes mellitus so they can prevent the disease prevalence to certain extent when they get old. So they could get benefits from doing certain healthy preventive measures regarding diabetes mellitus.

5.3 Recommendations

The health of the migrant populations is considered as the important health issue by the host country. As the increasing numbers of migrants flee to the neighboring countries for their employment, health profiles of them reflect the health system of the host country to a certain extent. As the migrant workers tend to emphasize more to earn money for their survival rather than the healthcare, the vulnerability of them to expose to certain health problems might become dominant.

Similarly, the difficulty of getting correct data from that migrant population because of their unstable migrant nature make difficult to get the actual prevalence of the diseases.

Diabetes mellitus prevalence is strongly related to unhealthy behaviors of the individuals. It is important for these individuals to be fully informed about the nature of that disease and preventive measures. So health education is important for the migrant workers of this research. There should be policy implementation of the health issues of the migrant workers to provide effective health care both for preventive and curative measures. Health workforce is also important in implementation of health policy and there should be enough health workers for health education and prevention programs and curing of diabetes mellitus and other non-communicable diseases. There should be sufficient technologies, financing and equipment or health research among the migrant population.

Further researches to estimate the prevalence and morbidities concerning diabetes mellitus should be done since there were few researches regarding diabetes mellitus among the migrant populations. There may be hidden cases of diabetes mellitus as some respondents don't know whether they have diabetes mellitus or not. Regular and routine blood glucose test is needed for that purpose so that the estimation of diabetes prevalence could be figured out. Effective health care for the diabetes patients among the migrant workers should be provided to prevent the complications. People who are

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at risk of having diabetes mellitus have to ensure that they have been informed about the preventive measures and have to follow lifestyle modifications effectively to prevent the diabetes mellitus to the certain extent.

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APPENDIX

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Appendix A

Participant Information Sheet

Title of thesis/research project – Knowledge, attitudes and practices regarding diabetes mellitus among Myanmar migrant workers in Bang Khun Thian district, Bangkok, Thailand

Name of researcher – Dr. Nyan Win

Position – Master of Public Health student, College of Public Health Sciences, Chulalongkorn University, Bangkok, Thailand.

Office address – College of Public Health Sciences, Chulalongkorn University, Bangkok, Thailand.

Home address- Room 0938, Chulalongkorn University International House, Chula Soi 9, Wangmai, Pathumwan, Bangkok, 10330.

Phone-0917821203

Email-nsstudent276@gmail.com

1. You are invited to participate in the research. It is important for you to understand the purpose of this research before you participate in it. Please read the following information carefully and feel free to ask about the points which you feel unclear.

2. The research is about knowledge, attitude and practice towards diabetes mellitus among Myanmar migrant workers living in Bang Khun Thian district, Bangkok, Thailand.

The objectives of the research are

General Objective

To study the knowledge, attitudes and practices regarding diabetes mellitus among Myanmar migrant workers in Bang Khun Thian district, Bangkok, Thailand.

Specific Objectives

(i) To evaluate the knowledge, attitudes and practices related to diabetes mellitus among Myanmar migrant workers in Bang Khun Thian district, Bangkok, Thailand.

(ii)To describe the socio-demographic characteristics and their relation to awareness, risk factors, knowledge, attitudes and practices regarding diabetes mellitus among Myanmar migrant workers in Bang Khun Thian district, Bangkok, Thailand.

Detail of the participant

Inclusion criteria

Myanmar male and female migrant workers between 18 years and above who must have been living in Thailand for at least 2 weeks.

Exclusion criteria

Myanmar migrant workers both male and female who are not willing to participate in the research. Those who don't understand Burmese language.

The required no. of participants is 422.

The researcher's assistants will be recruited and they were explained about the questionnaire of the research. The duration of the interview will be about 30-45 minutes for each participant during the interview. During the interview the socio-demographic details of each participant and knowledge, attitudes and practices regarding diabetes mellitus will be asked. All information will be kept confidential and there will be only description of the overall research picture as the illustration of research. The researcher and the assistants will explain the information of research process. There will be no risk for each participant to participate in the research. The research will provide the basic socio-demographic characteristics of each participated household, knowledge, attitudes and practices towards diabetes mellitus among Myanmar migrant workers living in Bang Khun Thian district, Bangkok, Thailand.

3. The participation of each subject is voluntary and each of the participants could refuse and withdraw from the research at any time. There will be no harm for each participant for withdrawal from the research.

4. If the participant would like to ask any question or would like to know any information, the researcher will be available all time. If the researcher gets the new information(s) concerning risk or benefit of the participant, it will be immediately informed.

5. Results of the study will be described as an overall statement with anonymity for thesis submission and all data will be kept as confidentiality. Coding system will be used for working status. In the data interpretation system, only coding will be mentioned and names will not be described. All data will not be shared and shown to anyone. The researcher will ensure the participants that all the collected data will be used for research purposes only.

6. The chief researcher will have to tell the correct answer for each question if the participants would ask for it.

7. In case the researcher does not treat you as stated in the participant's information sheet, the respondent(s) can report to Ethical review committee for research involving human research subjects, health science group, Chulalongkorn University (ECCU). 2nd floor, Chamchuri 1 Building, Phayathai Road, Bangkok, 10300, Thailand, Tel:0-22188147 Fax: 0-2218-8147 E-mail: eccu@chula.ac.th

Appendix B

Informed Consent

Date---------- **Code number** -----

I who have signed below agree to participate in this research.

Title: Knowledge, attitudes and practices regarding diabetes mellitus among Myanmar migrant workers in Bang Khun Thian district, Bangkok, Thailand

Researcher's name- Dr. Nyan Win

Address----Room 0938, Chulalongkorn University International House, Chula Soi 9,Wangmai, Pathumwan, Bangkok, 10300

Phone---0917821203 **Email**-nsstudent276@gmail.com

I have read and been informed about the objectives of the research. I clearly understand the explanation about the research by the researcher.

I willingly agree to take part in this research and permit the researcher to ask the questions involved in the structure questionnaires.

I have the right to withdraw from the research at any time I wish. That withdrawal will not have any harmful consequence for me.

The researcher has confirmed that the research process will be exactly the same as described in the information sheet. All personal information will be kept confidential. Results of the study will be described as an overall statement with anonymity.

If I am not treated as indicated in the information sheet, I could report to the ethical review committee for research involving human research subjects, health sciences group, Chulalongkorn University (ECCU), 2nd floor, Chamchuri 1 Building, , Phyathai road, Bangkok 10300, Thailand, Phone:0-2218-8147 Fax: 0-2218-8147 Email-eccu@chula.ac.th

I have also received a copy of information sheet.

Sign----------	Sign----------	Sign--------
Researcher	Witness	Participant

Appendix C

Questionnaires

Date---------- Code of the participant --------

Questionnaires for Socio-demographic characteristics

1. Age ---------- years
2. Gender

[1] [ ] Male

[2] [ ] Female

3. Marital status

[1][ ] Single

[2][ ] Married

[3][ ] Divorced

[4][ ] Separated

[5][ ] Widowed

4. Education

[1][ ] Can read and write but never attended the school

[2][ ] Primary school level (1st to 5th grade)

[3][ ] Middle school level (6th to 9th grade)

[4][ ] High school level (10th to 11th grade)

[5][ ] Higher education (University level)

[6][ ] Others (Specify) ----------

5. Occupation

[1][ ] Factory worker

[2][ ] Construction worker

[3][ ] Dependent

[4][ ] Other (Specify) ----------

6. Working status

[1][ ] With work permit [2] [ ]Without work permit

7. How long have you been living in Thailand?

[1] [ ] 2 weeks to 1 year [2] [ ] Above 1 year

8. Ethnicity

[1][ ] Burmese

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[2][ ] Mon

[3][ ] Rakhine

[4][ ] Kayin

[5][ ] Shan

[6][ ] Other (Please specify) ----------

Questionnaires for general awareness of diabetes mellitus

1. Have you ever heard of diabetes mellitus?
   [1] [ ] Yes [2] [ ] No
2. Have you ever heard of gestational diabetes?
   [1] [ ] Yes [2] [ ] No
3. Have you ever heard of insulin injection?
   [1] [ ] Yes [2] [ ] No
4. According to medical check-up, did the medical doctor tell you that you have diabetes mellitus?
   [1] [ ] Yes [2] [ ] No [3] [ ] Don't know
5. How long have you been diagnosed that you have diabetes mellitus? (Skip if the answer in question No. 4 is No or Don't know.)

   [1] [ ] Below one year [2] [ ]One year and above

Questionnaires for risk factors of diabetes mellitus

1. Have you ever been pregnant? (Only for the female respondents)
   [1] [ ]Yes [2] [ ]No
2. Have you ever been told by a medical doctor that you had gestational diabetes when you were pregnant. (Only for the female respondents who were pregnant)
   [1] [ ]Yes [2] [ ]No [3] [ ] Don't know
3. Do you have diabetic(s) in your family?
   [1][ ]Yes [2] [ ]No [3] [ ]Don't know
4. If you have diabetic (s) in your family, what is your relationship with him/her/them?

   [1][ ]Parent [2][ ]Sibling

   [3][ ]Grandparent [4][ ]Child

   [5][ ]Parent+sibling [6][ ]Parent+grandparent

[7][ ]Parent+child [8][ ]Sibling+grandparent

[9][ ]Sibling+child [10][ ]Grandparent+child

[11][ ]Parent+sibling+grandparent [12][ ]Parent+sibling+child

[13][ ]Parent+grandparent+child [14][ ]Sibling+grandparent+child

[15][ ]Parent+sibling+grandparent+child [16][ ]Other

5. Your Body weight in ------ kg (or) pound and height ----- in cm (or) m (or) feet
(BMI will be calculated by the principal researcher)

6. Do you smoke?

[1][ ]Yes [2][ ]No [3][ ]Quit

7. According to medical check-up, have you ever been told by a medical doctor that you have hypertension?

[1] [ ]Yes [2] [ ]No [3] [ ]Don't know

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Questionnaires for knowledge about diabetes mellitus

Please choose one answer from three responses (True, False and Not Sure)

No.	Question	TRUE	FALSE	NOT SURE
1.	Prevalence of diabetes can be reduced by			
	(1.1)Doing regular exercise ≥ 30 minutes per day			
	(1.2)Maintaining normal body weight			
	(1.3)Avoid overeating of sweet foods			
	(1.4)Eating vegetables regularly			
2.	Causes of diabetes mellitus			
	(2.1) Genetic cause			
	(2.2) Overeating of sweet foods			
	(2.3) Insulin deficiency			
3.	Complications of diabetes mellitus			
	(3.1) Retinopathy (eye disease)			
	(3.2) Proneness to infection			
	(3.3) Nephropathy (kidney disease)			
	(3.4) Ischemic heart disease			
	(3.5) Stroke			
4.	Management of diabetes mellitus			
	(4.1) Diet control			
	(4.2) Regular exercise			
	(4.3) Control of body weight			
	(4.4) Prescribed medications			
5.	Symptoms of diabetes mellitus			
	(5.1)Frequent urination (polyuria)			
	(5.2)Frequent thirst			
	(5.3)Frequent hunger			
	(5.4)Weight loss			
	(5.5)Impaired wound healing			

(Continued) Questionnaires for knowledge about diabetes mellitus

No.	Question	TRUE	FALSE	NOT SURE
6.	Diabetes mellitus is more prevalent in the people with the age of 40 and above.			
7.	Diabetes mellitus is also prevalent among the people below the age of 40.			
8.	Diabetes mellitus can be diagnosed by blood glucose testing.			
9.	Smoking is associated with the prevalence of diabetes mellitus.			
10.	Diabetes patients need to seek for regular medical checkup to prevent and get treatment for complications.			
11.	There is no specific relation between the prevalence of diabetes mellitus and gender difference.			
12.	There are special foods for diabetes patient. (*)			
13.	There are two types of diabetes mellitus.			
14.	Diabetes mellitus means raised sugar level in urine only. (*)			

* Negative statement

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Questionnaires about attitude towards diabetes mellitus

Please choose one answer from five responses (Strongly agree, agree, not sure, disagree and strongly disagree)

No.	Question	SA	A	N	D	SD
1.	We should aware of diabetes mellitus as its prevalence is increasing globally.					
2.	I believe that if I am diabetic, my children will have high risk of having diabetes.					
3.	I think we should reduce stress as much as possible to prevent diabetes mellitus.					
4.	I think we should do regular exercises to prevent diabetes mellitus.					
5.	I believe that less eating of salty, sweet and oily foods can help us to prevent diabetes mellitus.					
6.	I think that tight fitting shoes should be avoided to diabetes patient.					
7.	I think we could check the blood glucose regularly to know whether we have diabetes mellitus or not.					
8.	I think that diabetes patient must check their blood glucose regularly.					
9.	I think that diabetes mellitus is a chronic disease and it has to be cured and controlled throughout the entire life.					
10.	I think that diabetes mellitus is more prevalent in the rich people. (*)					
11.	I think that diabetes mellitus can be managed by the medications only. (*)					

* Negative statement

Questionnaires for practices regarding prevention of diabetes mellitus for all respondents

Please choose one answer from five responses (regularly, often, sometimes, seldom and never)

No	Question	Regularly	Often	Sometimes	Seldom	Never
1.	I do regular exercise at least 30 minutes per day.					
2.	I seek for medical checkup with the physician.					
3.	I eat less sweet foods and less oily foods.					
4.	I eat vegetables in my meal.					
5.	I eat less salty foods and other salty spices.					

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Questionnaires for practices regarding treatment and monitoring for complications of diabetes mellitus in diabetes patients.

Please choose one answer from five responses (regularly, often, sometimes, seldom and never)

No.	Question	Regularly	Often	Sometimes	Seldom	Never
1.	I get eye examination with the physician.					
2.	I check my blood glucose.					
3.	I take the medications for diabetes as prescribed by the medical doctor.					
4.	I eat my diet as instructed by the medical doctor.					
5.	I reserve food for hypoglycemia.					
6.	I seek for treatment from the medical doctor every time I feel sick.					

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Appendix D

Schedule

Research process	2014			2015						
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Research question formulation and literature review										
Proposal										
Formatting questionnaire										
Ethical approval										
Data collection										
Data analysis										
Report writing and examination										

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Appendix E

Estimated Budget

Sr	Activities	Cost (Baht)
1.	Paper for pretest (42*15)	630
2.	Transportation fee (Pretest) (1*400)	400
3.	Meal (1*150) for 2 assistants	300
Data collection		
4.	Transportation fee (400*12)	4800
5.	Assistant fee (200*8 persons) for 12 days	19200
6.	Photocopy (15*400)	6000
7.	Lunch (150*8) for 12 days	14400
8.	Miscellaneous	5000
9.	Journal Publication fee	1000
	Grand Total	51730

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