SOCIAL SUPPORT AND LIFE-STYLE MODIFICATION AMONG TYPE 2 DIABETES AT CHAMPASAK HOSPITAL, LAO PDR

BY

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INDEPENDENT STUDY

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ABSTRACT

This study was aimed to assess life-style modification among type 2 diabetes, and identify the relationship between patient’s characteristics, social support, source of information and health care provider-patient’s communication with life-style modification among type 2 diabetes. Face-to-face interviews were conducted in 162 type 2 diabetes who attended outpatient department at Champasak Hospital, Champasak Province, Lao People's Democratic Republic (Lao PDR). Data analysis was performed by using analysis of variance (ANOVA) and multiple regression at significance level of 5%.

The study revealed that 51.9% of participants had poor life-style. Factor associated with life-style modification was doctor-patient communication (p-values 0.04). The group of poor peer support was 92.0%, whereas good family support was 52.5%. Level of satisfaction to health services was in good level (83.3%). On the other hand, doctor-patient communication at poor level was 53.1% which was similar to...
nurse-patient communication (51.2%). This study found that most participants had limited access on information about Diabetes Mellitus. Most participants (96.3%) could not control their blood sugar level. These findings suggest that health care provider pays a crucial role in assisting diabetes patients on their life-style modification especially in medical adherence. Health policy needs to focus on how to improve blood sugar level among type 2 diabetes.

**Keywords:** Social support, Lifestyle modification, Healthcare provider.
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<td>BMI</td>
<td>Body Mass Index</td>
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<tr>
<td>Type DM</td>
<td>Type Diabetes mellitus</td>
</tr>
<tr>
<td>FBS</td>
<td>Fasting Blood Sugar</td>
</tr>
<tr>
<td>DM</td>
<td>Diabetes mellitus</td>
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<tr>
<td>IDF</td>
<td>International Diabetes Federation</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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<tr>
<td>ADA</td>
<td>American Diabetes Association</td>
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<tr>
<td>EGLR</td>
<td>Estimated glomerular filtration rate</td>
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<td>NPDR</td>
<td>Non-proliferative diabetic retinopathy</td>
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<td>PDR</td>
<td>Proliferative diabetic retinopathy</td>
</tr>
<tr>
<td>VA</td>
<td>Visual acuity</td>
</tr>
<tr>
<td>CAD</td>
<td>Coronary artery disease</td>
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<td>CABG</td>
<td>Coronary artery bypass graft</td>
</tr>
<tr>
<td>CVA</td>
<td>Cerebrovascular accident</td>
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<td>OPD</td>
<td>Outpatient department</td>
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<tr>
<td>IPD</td>
<td>Inpatient department</td>
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<tr>
<td>LDL</td>
<td>Low-density lipoprotein</td>
</tr>
<tr>
<td>NIDD</td>
<td>Non-insulin dependent diabetes mellitus</td>
</tr>
<tr>
<td>FBG</td>
<td>Fasting blood glucose</td>
</tr>
<tr>
<td>IGT</td>
<td>Impaired glucose tolerance</td>
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</table>
CHAPTER 1
INTRODUCTION

1.1 Rationale and Justification:

Diabetes mellitus (DM) is a chronic non-communicable metabolic disease characterized by an impairment in the use of glucose, due either to an inability of the pancreas to produce insulin (Type 1 DM), or an inefficient use of insulin (Type 2 DM) both types result in hyperglycemia\(^1\). Type 2 DM represents 90% of all cases in the world. The inefficient use of insulin is mainly caused by unhealthy behaviors, such as low physical inactivity or a diet unhealthy leading to obesity and hyperglycemia which are the result of poorly controlled blood sugar. It can lead to serious complications that affect various organ systems, particularly damage to nerves and blood vessels. The reduction of blood flow and nerve damage which are caused by the disease in the lower extremities such as foot ulcers and infections, which can lead to amputation. Most consequences result from a poor adoption of preventive measures. Self-care activities among type 2 DM mellitus patients that can be performed by the individual in order to prevent the appearance of evitable undesirable outcomes. It is known that knowledge on these activities are priority to preventive self-activities. However, creating awareness among patients and getting them to engage in self-care activities is a difficult task, because it involves many complex sociocultural determinants that are specific to individuals and their environment.\(^2\)

Type 2 diabetes causes many complications. There are hypoglycemia, ketoacidosis, nephropathy, neuropathic, diabetic foot ulcers, macro vascular comorbidities, dyslipidemia, hypertension, metabolic syndrome, retinopathy, advance eye and blindness. Risk factors for mortality among type 2 DM with complication are aging, smoking, lower BMI (26-30kg/m\(^2\)), macro vascular disease and nephropathy. In USA, 70 individuals per 100,000 cases DM were amputated. Diabetic retinopathy which is a leading cause of visual impairment and blindness is another serious consequence of poorly controlled diabetes. About 4 million of individuals diagnosed with DM have a visual impairment. 1% of blindness in the world can be attributed to
DM. Diabetes is also a leading cause of kidney failure. 26% of individuals with DM have chronic renal failure. Finally, the overall risk of dying among people with diabetes is twice that of non-diabetics.\textsuperscript{(1)}

In 2014, World Health Organization reported 422 million adults living with diabetes, only 108 million in 1980, which increased from 4.7% to 8.5% in adult population. In addition, if comparing in 2012 diabetes caused 1.5 million patients and 2.2 million deaths, occur before the age of 70 years. Majority of people are affected by type 2 diabetes mellitus\textsuperscript{(3)}. A number of Type 2 diabetes mellitus patients is increasing Globally. The Prevalence of DM was estimated at 8.3%. Western Pacific region disease causes 5 million deaths per year. About 180 million individuals are underdiagnosed; out of these, 50% are less than 60 years of age. Two out of three people with diabetics are living in middle and lower-income countries, in developed countries, the highest prevalence of DM the disease was found in North America and the Caribbean region, with an estimated prevalence at 11.4%. However, these regions have the lowest number of undiagnosed cases.\textsuperscript{(4)} In the Western Pacific region, there are 138 million (8.5%) individuals living with diabetes. This represents 8.4% of the adult population. It is estimated that 74% of diabetic individuals are undiagnosed. There are 1.8 million deaths related to DM and 45% occur in people who are under 60 years old. 387 million people are suffering from diabetes worldwide. (Global Burden of Disease Study 2013) Diabetes causes 4.9 million deaths per year. It is expected that the prevalence of DM will increase in the future \textsuperscript{(5)}; it is estimated that the number of people affected with diabetes will increase from 75 million cases in 2014 to 123 million in 2035. (Global Burden of Disease Study 2015) the highest prevalence was in followed by India (8.63%), Thailand (8.45%), Sri Lanka (8.32%), Brunei (7.69%) and Myanmar (5.79%), Vietnam (5.33%) and Cambodia (2.56%).\textsuperscript{(6)}

In 2014, International Diabetes Federation (IDF) reported that diabetes in Lao PDR had the lowest prevalence in the Western Pacific region. However, it was estimated that 94.000 people were still undiagnosed\textsuperscript{(6)}. According to LAO PDR statistics, show the number of diabetes deaths among 30-69 years of age were 170 males and 280 females among 70+ years of age were 160 males and 310 females. Number of death attributable to high blood glucose between 30-69 years of age compared 280 people in males, and 440 people in females. 70+ years of age 280 males and 650 females.
The prevalence of diabetes and related risk factors with Diabetes 5.5% (male), 5.7% (females), overweight 13.6% (males) 20.0% (females), obesity 1.8% (males) 4.1% (females), physical in activities 3.1% (males) 14.6% (females). In 2014 the Proportional mortality 2% of total deaths, all ages (7) In 2017, International Diabetes Federation (IDF) reported that the prevalence of type 2 diabetes was 2.8% and 636 females with 62,000 causes were not undiagnosed in Lao PDR. (8) Diabetes is one of the major health and development challenges of 21st century. No country, rich or poor. It is immune to the epidemic. It is a chronic, incurable, costly, and increasing, but largely preventable non-communicable disease (NCD), which is responsible for millions of deaths annually debilitating communication, and incalculable human misery. There is no policy focus on promotion and prevention with supporting healthy of people, increasing metabolism among obesity and reduce high blood pressure among diabetes in this country. Regarding to health care and health service systems found that primary health care stress for immune system, prevention, risk behavior between risk group, informative regarding diabetes, which supports diabetes’s patient are able to self-care themselves, but still found that diabetes’s patient, who comes to hospital cause complication and not be able to blood sugar control remain decrease.

Champasak province is located in the south of Lao PDR. The province is adjacent to Savannakhet in the north, to Vietnam in the East, to Thailand in the west, and to Cambodia in the south. The total area is 15415 km² with 694,023 populations (9). Champasak province consists of 10 districts. Most of population are farmers. Regarding to health care and health service system, primary health care on the country is available to support that diabetes. However, that diabetes cannot control their blood sugar and DM complication are increasing. Most of them do not follow the doctor’s appointment, on the other hand, people do not pay attention on health care practice. Most of diabetes patients have several complications such as health promotion to prevent diabetes. The patients are limited on self-care diabetes perception so they prefer to use traditional medicine. The patients cannot to control blood sugar, dietary behaviors such as rice, fish sauce. Main diabetes patients are workers, framers, poor family, and ethnicity. 76 villages with health center, and 567 villages without health centers. The statistics show an increase trend of the 3 most complication are diabetes patients in Champasak diabetic retinopathy, diabetic neuropathy and diabetic nephropathy. health service for
diabetes patients does not meet the need and the quality.\textsuperscript{(9)} There are many ethnics with different culture in Champasak which can cause problems while providing health services. Furthermore, the transportation in the province is poor where people living in remote areas cannot access to health care services. This can cause in increasing number of DM with complication such as chronic kidney disease. Doctor’s appointments are every forthnight for new causes, Whereas every 3 months for old causes. Champasak hospital need to explore toward self-care diabetes patients and ensure that the quality of life of diabetes patient with life style of patients among difference. Social support is life-style modification among type 2 diabetes are essential. This study is very first research on social support and life-style modification on type 2 diabetes in Champasak. The findings can provide an opportunity to explore factors related to life-style modification among type 2 diabetes in order to control and prevent complication.

1.2 Research Question:

1. What is the life-style modification among type 2 diabetes at Champasak Hospital?

2. What are factors related to life-style modification among type 2 diabetes attended at Champasak Hospital?

1.3 Objectives

1. To assess social support and life-style modification among type 2 diabetes at Champasak Hospital.

2. To identify the relationship between patient’s characteristics, social support, source of DM information and health care provider-patient’s communication with life-style modification among type 2 diabetes at Champasak Hospital.
1.4 Research hypotheses

There are relationships between patient’s characteristics, social support, source of DM information and health care provider communication with life-style modification among type 2 diabetes.

1.5 Variables:

Dependent variables: Life-style modification among type 2 diabetes.

Independent variables: patient’s characteristics, social support, source of DM information and health care provider- patient communication.

Patient’s characteristics:
Characteristics of patient comprise of
- Age
- Gender
- Occupation
- Educational level
- Family income
- Duration of being diagnosed as type 2 diabetes

Social support
- Family support
- Peer support

Source of DM Information
- Social media
- Health care provider
- Broadcasting tower
- Friend
- Newspaper
- Family
- Care giver
Health care provider-patient communication

- Doctor
- Nurse

1.6 Operational definition

Type 2 diabetes refers to a patient who diagnosed as type 2 diabetes by medical doctor for at least 6 months.

Lifestyle modification refers to eating practice, adherence to medication, and physical activity.

Communication refers to doctor’s or nurse’s communication to type 2 diabetes on life-style modification (eating practice, adherence to medication physical activity)

Social support refers to perception of type 2 diabetes who was supported by family or peer in life-style modification (eating practice, adherence to medication physical activity)

Fasting blood sugar refers to the result of a blood sample taken after a patient fast for at least 8 hours. A normal Fasting blood sugar level for type 2 diabetes is less than 130 mg/dl.
### 1.7 Conceptual Framework

<table>
<thead>
<tr>
<th>Personal characteristics</th>
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<th>Health care provider communication</th>
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<tr>
<td>- Age</td>
<td>- Family support</td>
<td>- Social media</td>
<td>- Doctor</td>
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<td>- Gender</td>
<td>- Peer support</td>
<td>- Health care provider</td>
<td>- Nurse</td>
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<td>- Occupation</td>
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<td>- Family income</td>
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- Life-Style modification
  - FBS
  - Complications
CHAPTER 2
LITERATURE REVIEW

The literature Review was reported as following
2.1. Definition and Classification of diabetes mellitus
2.2. Type 2 diabetes
2.3. Situation of diabetes mellitus in Lao PDR
2.4. Life - style modification among type 2 DM

2.1 Definition and Classification of diabetes mellitus

Definition and Classification

Diabetes Mellitus (DM) is a non-communication disease which general was from high blood glucose levels. Due to defective insulin. The result of chronic hyperglycemic can cause to a dangerously dysfunction of immune system especially eyes, kidneys, nerves, heart, and blood vessels.\(^{(10)}\) diabetes mellitus was explored in 4 types as following:

Type 1 Diabetes

People with type 1 Diabetes can produce very little or cannot produce any insulin. It defines to either autoimmune or idiopathic that occurs generally in child, young and adults but it may affect to any group age. However, it is feature by deficiency of insulin due to destructive lesions in pancreatic. It was named as insulin dependent diabetes mellitus.\(^{(11)}\)

Type 2 Diabetes

People with Type 2 Diabetes cannot use insulin effectively. It refers to metabolic disorder resulting from either insulin resistance or the defect of insulin secretion. It was called noninsulin dependent diabetes mellitus (NIDDM). Those patients consisted of 80% to 90% of all DM. Furthermore, it is feature by heterogeneous, polygenic disorder resulting from interaction between susceptibility genes and lifestyle or environment factors.\(^{(12)}\)
Type 2 Diabetes is normally preceded by a long period of asymptomatic hyperglycemia. In prediabetes state, postprandial or post glucose levels are light elevated whereas fasting blood glucose (FBG) can usually be maintained by the near-normal range. The elevation of post glucose levels is used for the definition of impaired glucose tolerance (IGT) which was not specific reversible stage. 30% of these subjects’ progress to overt diabetes within 10 years. The elevation of FBG is used for the definition of impaired fasting glucose (IFG). In some individuals had compensated for insulin resistance by increased insulin secretion but type 2 DM did not develop. However, in a huge number of prediabetes individual’s multiple defects in insulin action and/or insulin secretion gradually lead to sub-stained hyperglycemia. Regarding to the consequence of insulin resistance, the β-cells produces increased amounts of insulin and compensates hyperinsulinemia by maintaining of normal glycemic. When compensation of β-cells to insulin resistance had failed, the decompensation of hyperglycemic state was developed. Thus, those patients have relative insulin deficiency. In general, these individuals do not need insulin treatment to survive. They were able to control by adopting a healthy diet, weight loss, improve behavior, and optimal physical activity. Therefore, type 2 DM was recruited to study about factors related with controllability of blood glucose levels. Type 2 diabetes was prior called non-insulin-dependent diabetes mellitus (NIDDM) or adult-onset diabetes. Type 2 diabetes may account for about 90 percent to 95 percent of all diagnosed cases of diabetes. Risk factors for Type II diabetes include older age, obesity, and family background of diabetes, prior history of gestational diabetes, impaired glucose tolerance, physical inactivity, and ethnicity especially African Americans, Hispanic/Latino Americans, American Indians, and some Asian Americans and Pacific Islanders are at particularly high risk for type 2 diabetes.

The Gestational diabetes an among 2-5% of all pregnancies but usually disappears when a pregnancy is over. Gestational diabetes occurs more frequently in African Americans, Hispanic/Latino Americans, American Indians, and people with a family who was diabetes than in others. Obesity is also relation to higher risk. Women who had gestational diabetes are at higher risk of developing Type 2 diabetes. In other study, about 40% of women with a history of gestational diabetes developed diabetes later lives. Other specific types of diabetes result from specific genetic
syndromes, surgery, drugs, malnutrition, infections, and other illnesses. Especially types of diabetes may lead to 1-2% of all diagnosed cases of diabetes. (14)

**Type 3 Diabetes**

Type 3 Diabetes is the first detected during pregnancy which classified as either Gestational Diabetes Mellitus (GDM) or hyper-glycemic in pregnancy. Women with slightly elevated blood glucose levels are classified as having GDM and women with substantially elevated blood glucose levels are identified as women with hyper-glycemic in pregnancy. It was estimated that most (75-90%) of high blood glucose case during pregnancy which may lead to Gestational Diabetes. (8)

**Type 4 Diabetes**

Type 4 diabetes is developed blood glucose levels above normal range and below Diabetes Diagnostic thresholds which meet criteria for impaired glucose tolerance (IGT). Regarding to two hours post 75g oral, load or impaired fasting tolerance (IGT). These conditions are also called intermediate hyperglycemic or prediabetes. (8)

### 2.2 Type 2 diabetes

Type 2 diabetes mellitus is caused by life-style factors and genetics. Life-style factor. It is essential factor to the development of type 2 diabetes mellitus which including obesity, lack of exercise, a high waist-hip ratio, poor diet. Stress, and urbanization. Dietary factors have an impact on the developing type 2 diabetes mellitus. Eating a lot of sugar-sweetened drink, saturated fats, Tran’s fatty acids and white rice is associated with an increased risk.

**Signs and symptoms**

The symptoms of type 2 diabetes are loss of weight, polyuria (frequent urination). Polydipsia (increased thirst), and polyphagia (increased hunger). Type 1 diabetes mellitus may develop rapidly symptoms in weeks or months. Type 2 diabetes mellitus usually develops much more slowly and may be absent. Prolonged high blood glucose can cause many conditions such as diabetes dermatomes and lens of eye change.
Diagnosis of type 2 diabetes:

The diagnosis criteria of type 2 diabetes were developed by American Diabetes Association (ADA) in the medical care and self-care of diabetes in 2013 recommended how to apply HbA1c test which consisted of plasma glucose criteria and either the fasting plasma glucose (FPG) and the 2-hour oral glucose tolerance test (OGTT) as following:

- Glycosylated hemoglobin level or HbA1c ≥ 6.5%
- The test should be conducted in a laboratory using a method that was certified and standardized to the DCCT assay.
- Fasting Plasma Glucose (FPG) test ≥ 126 mg/dl (7.0 mmol/L). Fasting refer to no caloric intake for at least 8 hours.
- 2-hours plasma glucose ≥ 200 mg/dl (11.1 mmol/L)
- during an oral glucose tolerance test (OGTT). The test should be conducted as described by WHO, which using a glucose load containing the equivalent of 75g anhydrous glucose dissolved in water
  - Random plasma glucose ≥ 200 mg/dl (11.1 mmol/L)
  - with symptom of hyperglycemia or hyperglycemic crisis.

Diabetes mellitus is diagnosed by level of fasting plasma glucose level ≥ 7.0 mmol/l (126 mg/dl), plasma glucose ≥11.1 mmol./l (200mg/dl) two hours after a 75 g oral glucose load as in a glucose tolerance test or glycated hemoglobin (HbA1c) ≥6.5%. The current definition suggested that fasting glucose measurements above 126 mg/dl (7.0 mmol/l) is considered diabetic for diabetes mellitus. It is better to determine level of fasting glucose because the comfort measurement and the appreciable time dedication of formal glucose tolerance testing. It expends two hours to complete measure.

Patients with glucose level from 110 to 125 mg/dl are considered to have impaired fasting glucose. Patients with plasma glucose at or above 140 mg/dl but not over 200 mg/dl The latter pre-diabetes mellitus states are a major risk factor for development to full-blown Diabetes mellitus.
Management diabetes mellitus:

The management of diabetes mellitus focuses on control blood sugar to normal levels. This can usually be accomplished with dietary control, exercise, and use of appropriate medications.\(^{(17)}\)

Diabetes patients who control of blood sugar regularly are not risk of the complications. The goal of treatment was HbA1c level of 6.5% which can control level. The other health impact that may increase of diabetes which included high cholesterol levels, obesity, Specialized shoes are widely used to reduce the risk of ulceration or re-ulceration in at-risk diabetes feet. the goal of keeping both short-term and long term blood glucose levels are include given patient education, dietetic support, and sensible exercise. Moreover, give the knowledge of self-care, prevention of cardiovascular disease or complication, lifestyle modifications and recommended to control blood pressure.\(^{(18)}\)

2.3 Situation of diabetes mellitus in Lao PDR.

Prevalence of type 2 diabetes Study by the International Diabetes Federation (IDF) in 2014 estimated that about 150,000 people were living with DM in Lao PDR, which showed a prevalence of 4.06%. of this makes Lao PDR formally the country with the lowest prevalence of diabetes in the Western Pacific region. However, it is estimated that 94,000 people are still undiagnosed.

Prevention and treatment

In Lao PDR, there are no guidelines on primary and secondary prevention of diabetes. Self-care education is limited following a lack of skilled personnel. Vientiane capital has 3 central hospitals that offer a specialized clinic with multidisciplinary teams. Only 3 DM clinics are unable to cope with all the needs of the population.
**Diabetes self-care**

In Lao PDR Diabetic care centers are available in three central which are Mahosot hospital, Sethathirath hospital and Mittaphab hospital. Consultation, monitoring and health education on self-care are provided for patients in outpatient. A patient who registered type 2 diabetes will receive self-care training on and is regular monitored. However, there are some doubts about the effectiveness of the approach used, particularly because there are very few people who are specifically trained to provide self-care to patients. Not all patients seem to receive advice on self-care. Moreover, even if a patient has been advised.

There three Diabetes care center are considered as reference centers that can provide diagnosis, health they are varied in capacity monitoring and health education in outpatient department. However, in one hospital, there is no skilled self-care educator. In another one, self-care teaching is not regularly provided. In the other one, self-care education is done by trained nurses at all consultation. Moreover, there is no standardized way of providing self-care education between three centers. Elsewhere in the country, there are simply no services providing this type of training to diabetic patients. In Lao, PDR elsewhere, there is no service to provide self-care for diabetes level. type 2 diabetes.

**Controlling and assessment of DM**

Type 2 diabetes to control blood sugar in normal condition, there are no symptom. Patients stay with normal life, due to diabetes are not able to treat, just treatment and provide health care practice and information including duration of meditation dose, dietary, physical activities, self-care practice to control blood sugar to decrease the complication disease. \(^{(11)}\)

Type 2 DM have to be early detection, then the patients who have diagnosis type 2 DM, those must immediately take action regarding self-care practice and knowledge need to be provided, according to the efficiency guidelines and appreciated disciplines, therefore American Diabetes Association, 2014 have the legislation of self-care practice for diabetes patients as following:

- Fasting blood sugar
- Pre-prandial capillary plasma glucose from 70-130 mg/dl
- Peak post capillary plasma glucose less than 180 mg/dl
- Sugar blood level or HbA1c less than 7 Cholesterol
- Type of blood cholesterol, LDL-Cholesterol less 100 mg/dl in case hearth blood cardiovascular or risky less than 70 mg/dl.
- The level of blood cholesterol b HDL - Cholesterol in male more than or equal 40 mg/dl and female less than or equal 50mg/dl
- Triglyceride less 150 mg/dl.
- Hypertension level
- High blood depress 130/80 mmHg
- BMI not more than 23 kg/m²

Table 2.1 Controlling blood sugar level.

<table>
<thead>
<tr>
<th>Diabetes control</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strong control</td>
</tr>
<tr>
<td>Sugar blood level during diet</td>
<td>70-110 mg/dl</td>
</tr>
<tr>
<td>Sugar blood level after meal 2 hours</td>
<td>&lt;140 mg/dl</td>
</tr>
<tr>
<td>High Sugar blood level after meal</td>
<td>-</td>
</tr>
<tr>
<td>HbA1c</td>
<td>&lt;6.5</td>
</tr>
</tbody>
</table>

For diabetes patients not long term, complication and complication disease need to control sugar blood as normal condition all time or strict control as a goal HbA1c <6.5 %, referring table above, there have been a problem in patients include blood sugar and weight growth. In generally, the control target is HbA1c <6.5 %.(20)

- Diabetes patients who may take care themselves and engage with the complication should control blood sugar strictly by HbA1c 7.0-7.5%.
- Diabetes with low blood sugar but the complication therefore, the control target not later than HbA1c 7.0 %. From the study and literature review found that diabetes control assessment in difference hospital and District hospital, mostly screening before breakfast and HbA1c.

In the study the monitoring blood sugar during not have anything before 90-<130 mg/dl and sugar blood average HbA1c less than 7%. In addition, Diabetes with
low blood sugar but the complication therefore the control target not later than HbA1c7.0 %.

Complication of type 2 DM.

Type 2 DM could develop microvascular complications which many be presented at diagnosis. It reflects in the fact that many patients will have had significant hyperglycemia for many years before the diagnosis is made. However, the risk of complication is associated to the duration of illness. the mortality and morbidity in type 2 diabetes is created by diabetes complication. the most important aspect of management in those patients may be addressing other vascular risk factor, in the same as improving glycemic control. Complication of diabetes cab be classified in to categories as following. (21)

Acute Complication

The acute metabolic complications of diabetes are characterized by hyperglycemic with or without acidosis. It is called the hyperosmolar hyperglycemic status. The development of the hyperosmolar hyperglycemic status carries on slowly within some day or week in the nonexistence of ketosis. In addition, either abnormal refluxes or motor impairments can reduce verbal ability and seizures consequence from abnormal neurological system. On contrary, a few patients with type 2 diabetic may have either the symptoms of hypoglycemia or low blood glucose such as hunger, sweating, shakiness, heart palpitations, slurred speech, and confusion. It is a cause of unsuitable management of diabetes such as inordinate total of antidiabetic drugs, excessive exercise, skipped or delayed meals, or drinking alcohol without some foods.

Chronic Complication

A long term complication is abnormality occurred in the circulation system. The resulting come from uncontrolled and untreated of high blood glucose levels in long periods. It can be divided into 2 terms as microvascular complications and microvascular complications.

The importance of risk factors for chronic complications particularly the microvascular complications along with cardiovascular disease are described as metabolic syndrome and insulin resistance. It is identified by obesity, hypertension and dyslipidemia that all factors separately relate to increase risk for mortality from cardiovascular disease. (21)
Obesity

Obesity strongly associates with the metabolic syndrome and cardiovascular risk factors. It occurs clinically as increased waist circumference and body mass index. The excess adipose tissue increased with BMI is influenced to serum lipid and blood pressure. It is associated with the risk of comorbidity. In addition, either the insulin resistance or metabolic abnormality is a cause of the visceral abdominal obesity which link to the progression of type 2 diabetic and cardiovascular disease. Those patients should be loss the weight moderately being about 5% of BMI. It is related to decrease insulin resistance, reduce blood pressure, and develop in glycaemia and serum lipid.(22)

Hypertension

Hypertension is up to 3 times more prevalent in patients with diabetes. In those patients, obesity contributes to increase the prevalence of hypertension, but accounts for only 50% of the excess. Other factors are sodium retention and activation of the renin-angiotensin system. Isolated systolic hypertension resulting from a loss of arterial elasticity is usually seen in elderly people but occurs about 20 years earlier in diabetic patients.

The threshold for instituting blood pressure-lowering strategies and the target BP for those on treatment should be 140/80 mmHg in patient with diabetes because of the vulnerability of their vascular endothelium. This threshold should be lowered 10 mmHg in those who already have evidence of complications.

Initial management should focus on lifestyle changes to promote blood pressure lowering. These many include; 1) Weight reduction 2) Limit alcohol intake 3) Reduce salt intake 4) Increase physical activity 5) Smoking cessation.(23)

Diabetic Retinopathy(DR)

Over time, uncontrolled diabetes can cause permanent damage to small vessels of eye, especially back of eyes (retina). This damage is called retinopathy.

In its early stages, retinopathy doesn’t affect vision. As damage gets worse, blood vessels can leak and if left untreated, can eventually cause blindness. New weak vessels form. Blood leaks from these weak vessels and it can result in blindness. Retinopathy can be treated by using laser therapy and surgery to seal off leaking vessels and remove blood blocking retina.(23)
**Diabetic Neuropathy**

Nerves affect all body functions. Diabetes can damage nerves by injuring the covering of nerves causing a condition called neuropathy. Keeping blood glucose close to normal prevents nerve damage. Regular physical exercise also helps to keep nerves healthy. Systems of body affected by neuropathy include:

- Feet and legs: Feet and legs are the most common areas affected by neuropathy.
- Symptoms of nerve damage to feet and legs include numbness, burning, loss of
  - Hot/cold sensation, tingling, pain and cramps.
  - Digestive and Urinary tract: Damage of nerve to stomach, intestines
  - Bladder can cause constipation, diarrhea, nausea, vomiting and inability to urinate properly.
- Blood pressure: Nerve damage can prevent blood pressure from rising as it
  - Should when one changes body positions. Sudden low blood pressure can cause dizziness.
  - Sexual Organs: When small blood vessel and nerve to sexual organ are damaged, man may experience impotence and women, vaginal dryness and loss of sensation. Good long term control of blood glucose can help prevent or reduce diabetes related sexual problems.

The health worker should test neuropathy once every year. There are ways to treat diabetes nerve damage. Some medicines are available but it is most important to keep blood glucose under good control.

**Diabetic Nephropathy**

Kidneys filter waste products from body into urine which is excreted. Diabetes cause small vessels in the kidneys to thicken, resulting in kidney damage (nephropathy). Damaged kidney cannot filter body’s wastes effectively and these waste begin to build up in body causing illness. Eventually, damaged kidneys may fail, making it necessary to have dialysis and / or a kidney transplantation. Signs and Symptoms of Kidney problems are early morning swelling around eyes, swelling of legs, High blood pressure Protein in urine Kidney damage can be effectively prevented.
by controlling blood glucose and blood pressure. If the health worker tells that some damage to kidney has occurred, one can still do quite a lot to preserve the remaining kidney by meticulously controlling blood glucose and blood pressure.

Bladder or kidney infections should be treated well. If one has symptoms of urine/bladder infection (cloudy urine, bloody urine, frequent urination, pain and burning during urination, back pain, fever with chills) contact a health worker immediately. (23).

2.4 Life - style modification among type 2 diabetes

The identification of risk factions is essential for successful implementation of primary prevention programs 2 diabetes can be classified General characteristics, social support and Source to information health. In this study, the factors were chosen as following:

Personal characteristics:

Age
The prevalence and incidence of type 2 diabetes are strongly related to age and about 50% of them are elder populations.(24) Many studies showed that age is related to the pathophysiology changes of the pancreas and beta-cell which are essential to secreted of insulin for control blood glucose levels. In those patients, the roles of the beta-cell begin to degenerate because of decreasing in insulin secretion and progressing in insulin resistance called glucose tolerance. According to Alex N., et al., they assessed characteristics of type 2 diabetes patient treated in primary care and predicted poor glycemic control (HbA1c ≥ 7.0%). It was found that younger age presented to associate with worse control (25) Whereas Blaum CS, et al., identified clinical characteristics associated to poor glycemic control in patients with type 2 diabetic cared in Michigan primary care physicians. They revealed that age was not significantly related to poor glycemic control(26) In Thailand, many studies suggested that the prevalence of DM progressed with age and got a maximum at some point after 55 years old (24).

Gender
The resulting of the NHES 2009 revealed that women have better rates of diagnosis than men and this difference was significant (27) On the contrary, Inter ASIA’s
study did not show the significant difference in the proportion of diagnosed type 2 diabetes by gender \(^{(24)}\). No systematic effect of gender on the prevalence and incident of type 2 diabetes is observed but the occurrence of diabetes might depend on gender in some ethnic groups \(^{(28)}\). Confirm to Siriwattanapornkul T. found that gender did not associate with the glycemic control in type 2 diabetes patients \(^{(29)}\). However, the attitude of disease, physical activity and dietary in men were lower influential to the glycaemia levels than females. \(^{(27)}\)

**Duration of being diagnosed with type 2 diabetes**

If diabetes patients have duration of diabetes for prolong period and poor control of blood glucose levels, many organs will be damage and develop in diabetes complications. According to the resulting of a study in the factors associated with glycemic control, the duration of DM was significantly related to the ability of glycemic control level \((P = 0.012)\). It was revealed that each one-year increase in duration diagnosed with DM was associated with a 5% reduction in the odds of good glycemic control \(^{(30)}\). Nicholas GA, et al., indicated that the higher HbA1\(_c\) levels which refer to poor glycemic control were predicted by the younger age, the duration of shorter diagnosis in type 2 DM and the interaction of age and duration \(^{(31)}\).

**Family history of type 2 diabetes**

Type 2 DM has related to family history more than type 1 diabetes since it depends on environmental factors. Many Studies of twins revealed that genetics play great role in the evaluation of type 2 diabetes. Arslanian SA \(^{(32)}\) and Harrison TA \(^{(33)}\) found that the patients having had the family history of diabetes were more increasing to DM 2-6 times than the other who absent family history. Lifestyle also effects to the progress of type 2 diabetes such as obesity which tend to patient’s families because of having similar eating and physical activity. If patients have had a family history of type 2 DM, it may be difficult to changes either lifestyle factors or genetic susceptibility. However, many studies were shown that it was possible to delay or prevent type 2 DM by exercising and losing weight \(^{(34)}\).

**Education**

According to Sharon Saydah, et al. studying disparity in diabetes-related mortality for socioeconomic status (SES) groups in nationally representative U.S. samples, having less than a high school education was associated with a twofold higher
mortality from diabetes after controlling for age, gender, race/ethnicity, marital status, and body mass index. These was compared with adults with a college degree or higher education level (35). However, Chantrakul I. revealed that no association between education level and the controlling of glycemic levels in type 2 diabetes. (36)

**Occupational**

The cross-sectional study was used for analysis with 299 subjects. Related factors in patients revealed that there was significant relationship between occupation and self-care practice type II patients (p<0.05) (37).

**Income**

Related factors of patients with Type 2 Diabetes revealed that there was significant relationship between income and self-care among type 2 diabetes patients (P<0.001). (38)

**Co-morbidities**

Co-morbidity among patients with diabetes was both minor and main depression are strongly associated with increased mortality. Further research will be necessary to disentangle causal relationships among depression, behavior risk factors, diabetes complications, and mortality (39) the researcher identified raised rates of depression in patients with type II diabetes, though there is a need to well controlled and better-reported studies to inform the development of effective treatments for depression in these patients. (40)

**Social support**

Social support is major component in affecting diabetes self-management for achieving clinical outcome such as glycemic control (41). Social support can be defined that “the extent to which an individual feels connected to other people in meaningful ways” (42) Social support refers to family, friends, their husband or wife, physician who revealed in different form of support such as emotional, instrumental, informational, and affirmation. Social support is a multidimensional concept, which expects the positive or negative health resulting depend on the quality of patient’s received social support, the satisfaction of patient to receive the support, or positive/negative association king of behavior from their source of social support.

However, Tang TS, et al., revealed that there was significant association between social support and diabetes-specific quality of life and they also suggested that “social support
may positively influence the initiation and maintenance of diabetes self-care behaviors” (43). Moreover, concern study effects of the diabetic patients’ perceived social support on their quality of life. It was formal that It was found that social support could enhance quality of life among those patients. They also suggested that social support increased in diabetes self-management could improve glycemic control among those type 2 diabetes (44).

The association between social support and various health outcomes is complex. For example, among patients with diabetes, Connell, Davis, Gallant, and Sharpe (1994) found that perceived social support was directly related to lower levels of depression for individuals with Type 1 and Type 2 diabetes. The benefits of social media far outweigh the risks, and physicians and other healthcare providers should join the droves of diabetes patients taking to Twitter and other social-media platforms, because it provided a lot of knowledge, doctors and nurses who have embraced new technology wholeheartedly (45).

**Social support**

**Family support**

Regarding study of Korean immigrants with type 2 diabetes to assess the influence of diet family support on glucose outcome and demonstrated that dietary specific family support, it was associated to glucose outcomes specially male (46) that conducted an observational cross-sectional study to analyze the association of social support and diabetes specific quality of life and self-care behavior among African American with type 2 diabetes. The finding indicated that social support influence diabetes. Impact of family support interventions was to increase perceived social support on self-management among type 2 diabetes. Individual who received support capable of getting advice when coping with difficulties and improving positive communication for diabetes care. It could be a positive impact on a positive relationship between patients and family members on diabetes self-management behaviors. For this reason, social support from family was effective in improving the diabetes self-management behaviors (47).

**Peer support:**

Peer support model provide a potentially low-cost, flexible health care services. In this way trained peer leaders can come qualified extension to a formal

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health care system, capable of assisting education delivery and bolstering the efforts of professional staff. As such, creating a cultural specific peer support program and determining whether it is acceptable and cost-effective in rural communities. A study enrolled at baseline,  completed follow-ups and had data that could be included into the study; they were aged 60.2 ± 12.1 years, 87% African American, 75% female, and 39% insulin-treated. In an overall GAM adjusting for imbalance across trial arms and time-related covariates, depressive symptoms improved for all, but after 15 months of follow-up intervention, participants experienced greater reduction in PHQ-8 score than control participants (p-values = 0.01). In stratified analyses, those with PHQ-8 ≥ 5 had unchanged HbA1c, lost weight (p-values = 0.03) and improved QOL (p-values = 0.04). Those with PHQ-8 < 5 also had unchanged HbA1c and lost weight, but did not improve QOL (p-values = 0.06). A study on peer shown improve amount of depressive symptoms, but resulted in greater weight loss and gains in QOL for those with baseline depressive symptoms compared to those without. After 6 months, patients in the peer support group experienced a significant decline in mean A1c value (P-values = 0.045). Also, mean diabetes self-management scores, mean self-efficacy scores and mean quality of life scores significantly improved in peer support group compared to control group (p-values <0.001). Peer support activities can be successfully applied in diabetes self-management, especially in areas with a shortage of professionals and economic resources.

Source of DM information
Access information refers to the ability to listen, read, speak and analyze computations as a process of checking correlation with the principles, belief, legal and social values of the society in order to provide information that is needed in a healthy condition.

Health care provider
Health providers included doctor and nurse. It found a good relationship and between health providers and patient which were associated with self-care practice and heathy of type 2 diabetes patients which can reduce the complication. The significant predictors, where system compatibility became the most critical characteristic to influence an individual health care provider’s performance. The previous information system success models should be extended to incorporate these
technological factors in the medical system research domain to examine the effectiveness of modern electronic health record systems. In this study, care providers’ performance was expected when the system usage fits with patients’ needs that eventually increased their productivity.\(^{(51)}\)

**Community support**

Researcher explored the context which community members navigate between locally available healthcare options, or incorporate strategies from both into their diabetes care regimens. The tension between indigenous community members and their biomedical healthcare providers, the changing food environment of this community, and the persistence of traditional gender constructions affect the management of type 2 diabetes and its associated symptoms.\(^{(52)}\) The post-test among studies reporting results among adults, most reported improvements in intervention groups in knowledge or adoption of regular physical activity among adult several investigators offered important reflections about the process of engaging communities and sharing decision making in participatory research approaches, as well as insights and limitations of community based diabetes prevention research. Many of the studies reported limitations in their design, including the lack of control or comparison groups, low response rates or lack of information on non-responders, or brief intervention periods.\(^{(53)}\)

**Life-style modification type 2 diabetes**

Type 2 Diabetes patients consists of dietary control, Regular follow-up, Medication adherence increasing physical activities, smoking cessation and reducing alcohol drinking to better quality of life among type 2 diabetes patients.

Individuals with type 2 diabetes do not comply with food group recommendations; particularly for fruit, vegetables, dairy and grains. Longitudinal research is required to better understand how food group intake changes over time after diagnosis.\(^{(54)}\) High prevalence of uncontrolled diabetes (85%) is noted in individuals with type 2 diabetes\(^{(55)}\) of the 120 screened subjects, 86 patients were included in the present study. A majority (76.7%) were overweight, and 51% had DM for the past 11–15 years. ANOVA was used to compare patients' glycemic status, peripheral diabetic neuropathy screening and medication adherence in all three follow-up visits, and \(p < 0.0001\) was considered as significant. Significant improvement in medication
adherence and reduction of the peripheral diabetic neuropathy severity \((p < 0.0001)\) were observed from patients' first to third visits.

Patient education is prudent for improving medication adherence. A result that potentially promotes optimal glycemic control and can reduce the prevalence of diabetic peripheral neuropathy in patients with type 2 diabetes. Health-care practitioners play a pivotal role in educating the diabetic population about medication adherence. Patients on oral and insulin combination therapy showed better adherence than those on oral therapy. Age \((B = -0.749; \ p = 0.004)\), copayment \((B = 0.549; \ p = 0.028)\) and oral therapy \((B = 0.827; \ p = 0.045)\) were the strongest predictors of poor adherence.\(^{(56)}\)

Medication adherence is a key factor of the therapy of chronic diseases in older people with chronic diseases. Inadequate medication adherence results in poor health outcomes. Therefore, the aim of this study is to investigate the effect of health literacy on medication adherence to provide information for improving health outcomes in older people with chronic disease.\(^{(57)}\) This was a cross-sectional study of people aged over 65 years with chronic diseases in Korea taking one or more medications for 6 months and over from an academic referral medical center. Each patient completed a structured questionnaire by interview or self-report. Of the 291 older participants, 30.6% had high medication adherence. In hierarchical multiple regression analysis.\(^{(57)}\)

Low adherence inhibits the intensification of glucose-regulating but not antihypertensive medication in type 2 diabetes patients with insufficiently controlled risk factors in the Netherlands. Adherence problems may lead to diminished or even discontinued antihypertensive treatment.\(^{(58)}\)

Eighty adults completed six-minute walk distance was low \((476.9 \pm 106.2 \text{ m})\), and negatively associated with female gender, age, neuropathic pain, diabetes duration, BMI, poor sleep quality, and fatigue and positively with habitual activity and education \((p < 0.05)\). Covariance matrices changed at age 59. In subjects age < 58, 6MWD was predicted by gender, sleep quality, and neuropathic pain \((R^2 = 0.593, \ p < 0.001)\). In those age ≥ 59, 6MWD was predicted by diabetes duration, education, and habitual activity \((R^2 = 0.554, \ p < 0.001)\). There were no shared predictors of 6MWD between groups.
Type 2 diabetes is associated with early declines in physical function; the predictors of which change in midlife. Therapies to maintain or improve physical function should be tailored by age, pain symptoms, and habitual activity levels.\(^{(59)}\) Prevalence of microalbuminuria was reduced at 1 year to 72.6% in the subjects who quit smoking and to 22.5% in those who continued smoking \((P = .015)\). Multivariate logistic regression analysis demonstrated that independently associated with the reduction in albumin to creatinine ratio \((84.8 \text{ vs } 28.7 \text{ mg creatinine})\) were amelioration of glycemic control \((P < .001)\), blood pressure \((P = .02)\), dyslipidemia \((P = .02)\), and insulin resistance \((P = .05)\). Smoking cessation also reduced the prevalence of peripheral vascular disease \((P = .03)\) and neuropathy \((P = .04)\). From the pharmacological and lifestyle interventions, smoking cessation had the highest and an independent contribution to the reduction of microalbuminuria \((P < .001)\). Smoking cessation in newly diagnosed type 2 Diabetes is associated with amelioration of metabolic parameters, blood pressure, and the reduction of microalbuminuria. Stricter counseling about the importance of quitting smoking upon type 2 DM diagnosis is necessary to protect against the development of diabetic nephropathy and vascular complications.\(^{(60)}\)

**Theory of self-care**

The framework of self-care originates was gather from the theory of self-care which was formulated by Dorothea Orem in 1971 as background of nursing practice concept which presented as human self-care regulatory function and assumes that people are distinct individuals and it should be self-reliant and responsible for their own care and others in the family care, and that individual knowledge of potential health problems which is necessary for promoting self-care behaviors. These behaviors are developed within a socio-culture context. Orem’s defines self-care as activities practice that individuals initiate and perform on their own behalf in protection life, health, and wellbeing. The theory also comprised of three concepts: the concept of self-care agency, the therapeutic self-care demand and the self-care requisites. Self-care institute is defined for human ability to engage in self-care conditioned by age developmental state, life experience socio-cultural orientation, health, and available resource. Therapeutic self-care demand the sum of self-care actions which was performed for some duration in order to meet self-care requisites by using valid methods and related
sets of operations and action. The self-care requisites are the actions directed towards provision of self-care and divided into three categories: Universal self-care requisites, Developmental self-care requisites and health deviation of self-care. Universal self-care requisites are the needs that are general to individuals associated with life processes and the maintenance of the integrity of human structure and functioning, and identifies these requisites as the maintenance of sufficient air, water and food, the provision of care associated with elimination process, the balance between activity and rest, between solitude and social interaction, the prevention of hazards to human life well-being, and promotion of human functioning. Developmental of self-care requisites is related with development, and derived from a condition, or associated with an event likes adjusting body changes. Health deviation are the needs resulting from disability, illness, or injury. These include; seeking and securing appropriate medical assistance, effectively carrying out medically prescribed measures, modifying self-concepts in accepting oneself as being in a particular state of health and in specific forms of health care and learning to live with effects of pathologic conditions. Successfully meeting universal and development self-care requisites is an important part of primary care prevention and ill health.  

For many individuals with Diabetes, the most challenging part of the treatment plan is determining what to eat. It is the position of the American Diabetes Association that there is not a one-size-fit-all eating pattern for individuals with Diabetes. Therefore, it is important that all members of the health care team can be knowledgeable about Diabetes nutrition therapy and support its implementation.  

**Ideal and behavior complication prevention**  
Type 2 diabetes have to pay attention to self-care practice in their dial life. If self-care practice was not good. It affects to blood sugar control. It my led to the complication. And the patient will face long life illness. In contrast, patients who was good at self-care practice. They can control blood sugar. Thus, in order to control DM. Eating behavior, physical activities. Adherence are the most important one to control blood sugar & complication.
Eating behavior.

Based on the survey with patients who was 64 years, a total 30 patients. The study found that the patients were not good at eating behavior. Due to the lack of knowledge and limitation of physical activity, appropriated environment and health provider supportive. In addition, health provider has to promote patient’s self-care practice. Referring to a study. It was conducted to promote self-care practice. In order to control blood sugar. And the study revealed that type 2 DM involved within appropriated dietary control, having high fat food. Unpunctual eating, and big amount for dinner time.\(^{(64)}\)

Physical activity

Physical activity was a significant factor to control blood sugar and can reduce the complication 50-60%. Patient’s physical activity was one element to control type 2 DM. However, the patients have to change. Then, life-style modification. The study revealed that lack of physical activity could cause non-communicable disease. Physical activity was a significantly factor to prevent & control type 2DM. The patient has to control dietary and do regular activity. In order to control blood sugar HbA1c in type 2 DM. HbA1c 1% decrease the risk of complication eye and kidney 40%. Reduce 38% of morbidity rate and 79% from cardiovascular. Referring to related study, physical behavior of patients 40%. They lack of regular physical activity.\(^{(63)}\)

Adherence to medical treatment

DM type 2 treatment aims to make patient long life. In order to control normal level of blood sugar. Avoid from complication. The treatment has to include nutrition food and physical activity. The patient was not able to control normal level of blood sugar. Patient has to take drug to reduce blood sugar. type 2 DM drug behavior had to conduct appreciated drug use and treatment planning. In order to avoid risk of drug use and side effects. Effectiveness of DM type 2 drug HbA1c found that Metformin 500 mg reduce HbA1c 1-2 % of Insulin. It may decrease HbA1c 1.5-3.5%. it depends on basic blood sugar of patient.\(^{(65)}\)
Behavior and complication prevention

Self-care practice among DM patient was essential, and they have to follow doctor’s recommendation. Otherwise, they will have lower immune system. If patient was not good at self-care practice, it may have led to infectious disease. Daily self-care practice and perception of self-care practice can avoid complication. Patient and their family can focus on self-care as following:

- At Least 7-8 hours of sleep per day
- Reduce level of stress to decrease blood sugar
- Regular physical activity to control blood sugar, and also follow doctor’s recommendation.\(^{(66)}\)
- Lay and foot problem from Neuropathy, Ischemia and infectious which may have led to amputation.\(^{(67)}\) Other study found that complication cause amputation which excludes an accident. In addition, the study found that DM patient have 25 times a higher risk of complication compares to others group. Individual behavior affects to health condition and illness. Type 2 diabetes need to know their health status. And aware of self-care practice to prevention complication. It is essential to revise the pattern of self-care practice.\(^{(68)}\)

Conclusion: This study reviewed regarding the conceptual framework, Lao DM situation and Champasak type 2 DM situation. Life style of type 2 DM patient, social support, source of DM information and health care provider. FBS and complications.
CHAPTER 3
MATERIALS AND METHODS

This chapter reviews materials and methods as following:

3.1 Study design
3.2 Population and Sample
3.3 Inclusion and Exclusion Criteria
3.4 Data Collection
3.5 Research instrument
3.6 Ethical Consideration
3.7 Data Processing
3.8 Statistics

3.1 Study design

This cross-sectional study was aimed to explore social support and lifestyle modification among type 2 diabetes patients in Champasak hospital. A face to face interview was performed for data collection using a structured questionnaire.

3.2 Population and Sample

Population were patients who diagnosed of type 2 DM for at last 6 months and who visited at OPD Champasak Hospital during 04-29 April 2018.

A sample size was calculated by the following formula:

\[
n = \frac{Z_{\alpha/2}^2 \, p(1-p)}{d^2}
\]

\[n\] = estimated sample size using either simple or systematic random sampling
\[Z\] = Standard normal score according to the significance level \[\alpha\] set .
\[\alpha\] = Significance level set at 5%
\[ Z_{\alpha/2} = 1.96 \]

P = Proportion of controllability of glycemic level among type 2 diabetes mellitus patients = 36.9% \hspace{1cm} (11)

d = Maximum allowance error set at 0.07749.

Hence, the sample size was:

\[ n = \frac{(1.96)(1.96)(0.369)(1-0.369)}{(0.07749)(0.07749)} \]

\[ n = 148 \]

Add 10% as estimated incompleteness of information = 14 case

Therefore, sample size was at least 148+14 = 162

**Sampling Scheme**

There were 10-12 type 2 diabetes who participated into the interview each working day.

### 3.3 Inclusion and Exclusion Criteria

**Inclusion Criteria:**
- Type 2 diabetes who attended at OPD of Champasak Hospital
- Type 2 diabetes who was 35 years or older
- Type 2 diabetes had been diagnosed for at least 6 months

**Exclusion Criteria:**
- Type 2 diabetes who could not communicate in Lao language.

### 3.4 Data Collection

The data were collected after obtaining an ethical clearance from the University of Health Science, Vientiane Capital, Lao PDR. Firstly, researcher submitted a letter from Champasak College of Health Science to Champasak Hospital. Hospital director had approved and informed OPD. Secondly, data collection was conducted in working day. At the face to face interviews, the research explained the
objective of the study and the risks and benefits if they participated in this study until they understood. Respondents were asked to sign an informed consent and the interview took around 15 minutes for each.

3.5 Research instrument

A structured questionnaire was developed in English and reviewed by experts. Then, it was translated into Lao language. The questionnaire consisted of 6 parts as following:

**Part I:** Patient’s hospital record: This part includes weight, height, blood pressure at current visit the history of complications or admitted as inpatient and co-morbidities.

**Part II:** Personal characteristics: This part comprised of general characteristics of the patient, which are age, gender, education, occupation, income, duration of DM, family of history DM.

**Part III:** Lifestyle modification: This part was comprised of self-care practice with type 2 diabetes mellitus of diet modification, physical activities, and medication questionnaires items was scored as following: life style questionnaire 24 item for type 2 Diabetes

**Part IV:** Social Support: This part comprised of family support, and peer support, community support on the dietary, medication, physical activities accompanying to the hospital. Those questionnaires were scored to each 14 items as following:

Social support was assessed by assigning score 0 to 2 for the response from never to always. Then total score as well as the score for family support and peer support was obtained by adding up the score to each question. The score on social support range from 0 to 14 and the score for family and peer support range from 0 to 14. The higher the score was the more the support.

**Part V:** Source of DM information this part comprised of diabetes mellitus self-care information, duration diagnosed with type II DM, co-morbidity family history of DM and accessibility to hospital service.
Part VI: Health care provider and doctor -patient communication: consisted of never = 0, Sometime = 1, Always = 2. With type 2 diabetes by doctor and nurse. Range of score is from 0 to 2 and score was given as followed: Poor =0, fair = 1, good = 2 Maximum score is 20 and minimum score is 0. the total score for each individual was calculated and classified in to 2 levels.

Table 3.1 Scoring and grouping criteria

<table>
<thead>
<tr>
<th>Possible score</th>
<th>Grouping criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Life-style modification</td>
<td>0 - 72</td>
</tr>
<tr>
<td>Eating practice</td>
<td>0 - 31</td>
</tr>
<tr>
<td>Adherence to medical treatment</td>
<td>0 - 24</td>
</tr>
<tr>
<td>Social support</td>
<td></td>
</tr>
<tr>
<td>Family support</td>
<td>0 - 14</td>
</tr>
<tr>
<td>Peer support</td>
<td>0 - 14</td>
</tr>
<tr>
<td>Doctor and nurse-patient communication</td>
<td></td>
</tr>
<tr>
<td>Doctor</td>
<td>8 - 24</td>
</tr>
<tr>
<td>Nurse</td>
<td>2 - 6</td>
</tr>
<tr>
<td>Service satisfaction</td>
<td>11 - 55</td>
</tr>
</tbody>
</table>

Ethical Considerations

The approval of ethical clearance from National Ethics Committee for Health Research, LAO PDR No 054/NECHR was issued 26 March 2018. Furthermore, the confidentiality of participates was kept as the first priority. The study objectives and background were read and explained to respondents. After data was analyzed, all questionnaires were destroyed and any personal information of participants was not revealed in the report.

3.6 Data management and analysis

Data processing covered the process as following.
Epi Data 3.1 was used for data entry to assure an accuracy and checking were performed.

After data cleaning was performed. Each participant was allocated of questionnaires code and hospital number code, which allowed to link with the patient’s record of Champasak Hospital.

Descriptive statistics was utilized in order to describe each variable following the conceptual framework. Measure of central tendency which including mean, median, mode, standard deviation and percentage distribution was used for quantitative type of variables. For qualitative type of variables percent and mode was used. Pearson correlation was performed to identify the relationship between two quantitative variables.

Inferential statistics: ANOVA, t-test for correlation and multiple regression were used at 5% significance level. Bootstrap was applied to obtain 95%CI of population mean and correlation.
CHAPTER 4
RESULTS AND DISCUSSION

A cross-sectional study was performed to interview a total of 162 type 2 diabetes aged 35 years or older who attended at Champasak Hospital, Champasak province, LAO PDR. The results were presented as following:

4.1 Personal characteristics
4.2 History of complication
4.3 Body mass index and fasting blood sugar level
4.4 Lifestyle modification
4.5 Stress and stress management
4.6 Social support
4.7 Source of DM information
4.8 Health care provider
4.9 Service satisfaction
4.10 Factors related to life-style modification of type 2 Diabetes
4.11 Discussion

4.1 Personal characteristics

A total of 162 type 2 diabetes patients who attended at Outpatient Department of Champasak Hospital and who diagnosed at least 6 months were included in the analysis. Male subjects (50.6%) were similar to females. Their ages ranged from 35 to 79 years old with an average of 56.31 years (SD= 9.0 years).

Those who graduated of secondary school was 30.2%, followed by university and higher education (29.0%) and primary school (24.0%). However, 16.6% had never gone to school. In regards to occupation, 27.8% was unemployed, followed by farmers (26.5%), public servants (22.2%) and workers (11.1%). Regarding to monthly income, about half earned <2.5 M. kip (300 USD) per month. However, 43.2% of the participants had health insurance. The most common of health insurance were
government and state enterprise accounting for 71.4% and 15.7% respectively. The length of being diagnosed as type 2 DM was 3.78 years in average (SD: 2.59). About half were those who diagnosed for 2-4 years and >5 years accounting for 46.9% and 34.5% respectively as showed in Table 4.1.
Table 4.1 General characteristic of 162 type 2 diabetes

<table>
<thead>
<tr>
<th>Personal factors</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>82</td>
<td>50.6</td>
</tr>
<tr>
<td>Female</td>
<td>80</td>
<td>49.4</td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 50</td>
<td>43</td>
<td>26.5</td>
</tr>
<tr>
<td>50-59</td>
<td>64</td>
<td>39.5</td>
</tr>
<tr>
<td>60-69</td>
<td>44</td>
<td>27.2</td>
</tr>
<tr>
<td>≥70</td>
<td>11</td>
<td>6.8</td>
</tr>
<tr>
<td>Mean: 56.4, Median: 56.0, SD:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Education level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No school</td>
<td>27</td>
<td>16.7</td>
</tr>
<tr>
<td>Low (Primary)</td>
<td>39</td>
<td>24.1</td>
</tr>
<tr>
<td>Medium (Secondary)</td>
<td>49</td>
<td>30.2</td>
</tr>
<tr>
<td>High (University and)</td>
<td>47</td>
<td>29.0</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployment</td>
<td>45</td>
<td>27.8</td>
</tr>
<tr>
<td>Public servants</td>
<td>36</td>
<td>22.2</td>
</tr>
<tr>
<td>Retired</td>
<td>11</td>
<td>6.8</td>
</tr>
<tr>
<td>Businessman/woman</td>
<td>9</td>
<td>5.6</td>
</tr>
<tr>
<td>Farmer</td>
<td>43</td>
<td>26.5</td>
</tr>
<tr>
<td>Worker</td>
<td>18</td>
<td>11.1</td>
</tr>
<tr>
<td><strong>Family income (kip per month)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1,000,000</td>
<td>75</td>
<td>46.3</td>
</tr>
<tr>
<td>1,000,000-2,500,000</td>
<td>81</td>
<td>50.0</td>
</tr>
<tr>
<td>2,500,000-5,000,000</td>
<td>2</td>
<td>1.2</td>
</tr>
<tr>
<td>5,000,000-</td>
<td>4</td>
<td>2.5</td>
</tr>
</tbody>
</table>
Table 4.1 General characteristic of 162 type 2 diabetes (Cont.)

<table>
<thead>
<tr>
<th>Personal factors</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health insurance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>92</td>
<td>30.9</td>
</tr>
<tr>
<td>Yes</td>
<td>70</td>
<td>43.2</td>
</tr>
<tr>
<td>Gov’t Health Insurance</td>
<td>50</td>
<td>30.9</td>
</tr>
<tr>
<td>State Enterprise Health insurance</td>
<td>11</td>
<td>6.8</td>
</tr>
<tr>
<td>Others</td>
<td>9</td>
<td>5.6</td>
</tr>
<tr>
<td>Length of type 2 DM diagnosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1 year</td>
<td>30</td>
<td>18.5</td>
</tr>
<tr>
<td>2 - 4 years</td>
<td>76</td>
<td>46.9</td>
</tr>
<tr>
<td>&gt; 5 years</td>
<td>56</td>
<td>34.5</td>
</tr>
<tr>
<td>Mean = 3.78, Median = 3, mode = 2, S.D = 2.59, Min - Max = 0 - 13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.2 History of complications

Table 4.2 presented history and types of complications as obtained from medical records. 53.0% had no history of complication. The most common type of complications was diabetic retinopathy (38.3%), diabetes amputation (11.7%), followed by diabetic nephropathy (1.2%).
Table 4.2 History of complication among 162 type 2 Diabetes

<table>
<thead>
<tr>
<th>Complication</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of Complication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>86</td>
<td>53.1</td>
</tr>
<tr>
<td>Yes</td>
<td>76</td>
<td>46.9</td>
</tr>
<tr>
<td>Diabetic retinopathy</td>
<td>62</td>
<td>38.3</td>
</tr>
<tr>
<td>Diabetes amputation</td>
<td>19</td>
<td>11.7</td>
</tr>
<tr>
<td>Diabetic nephropathy</td>
<td>2</td>
<td>1.2</td>
</tr>
<tr>
<td>History of admission to IPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>146</td>
<td>90.1</td>
</tr>
<tr>
<td>Ever</td>
<td>16</td>
<td>9.9</td>
</tr>
</tbody>
</table>

4.3 Body mass index and fasting blood sugar level

37.3% of participants were pre-obese, followed by 2.5% of obesity and 20.5% were overweight. The underweights were 8.1% as shown in Table 4.3.

Mean = 258.22. Median = 247.33, S.D = 79.36, Min = 132.0, Max = 431.0

Table 4.3 Body mass index of 161 type 2 Diabetes

<table>
<thead>
<tr>
<th>BMI</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight (&lt; 18.5)</td>
<td>13</td>
<td>8.1</td>
</tr>
<tr>
<td>Normal weight (18.5-22.9)</td>
<td>51</td>
<td>31.7</td>
</tr>
<tr>
<td>Overweight (23.0-24.9)</td>
<td>33</td>
<td>20.5</td>
</tr>
<tr>
<td>Pre - obese (25.0-29.9)</td>
<td>60</td>
<td>37.3</td>
</tr>
<tr>
<td>Obesity (30.0+)</td>
<td>4</td>
<td>2.5</td>
</tr>
</tbody>
</table>

The data showed that the average FBS on last 3 visits among participants was high. The average FBS among was 258.22 mg/dl (Mean=258.22, Min -Max 132-431). No type 2 diabetes who could control FBS at the normal level. The majority of participants had FBS level between 200 – 299.99 accounting for 37.1%. Moreover, this...
study found that 34% among participants had FBS level at 300 mg/dl or above as showed in table 4.4

Table 4.4 Average FBS on last 3 visits

<table>
<thead>
<tr>
<th>Level FBS</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>130-139.99</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>140-149.99</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>150-159.99</td>
<td>11</td>
<td>6.9</td>
</tr>
<tr>
<td>160-169.99</td>
<td>8</td>
<td>5.0</td>
</tr>
<tr>
<td>170-179.99</td>
<td>8</td>
<td>5.0</td>
</tr>
<tr>
<td>180-189.99</td>
<td>6</td>
<td>3.8</td>
</tr>
<tr>
<td>190-199.99</td>
<td>8</td>
<td>5.0</td>
</tr>
<tr>
<td>200-299.99</td>
<td>59</td>
<td>37.1</td>
</tr>
<tr>
<td>300-399.99</td>
<td>45</td>
<td>28.3</td>
</tr>
<tr>
<td>400-499.99</td>
<td>9</td>
<td>5.7</td>
</tr>
</tbody>
</table>
4.4 Lifestyle modification

Lifestyle modifications included in this study were health behaviors which included physical activity, smoking and drinking alcohol, eating behaviors, adherence to medical treatment (drugs and appointment).

An overall life-style, 42.0% was at poor level, followed by 58.0% at moderate level. It was observed that none of them was at good level of lifestyle modification, as presented in Table 4.5.
Table 4.5 Level of lifestyle- modification of 162 Type 2 Diabetes

<table>
<thead>
<tr>
<th>Level of Lifestyle - modification</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>68</td>
<td>42.0</td>
</tr>
<tr>
<td>Moderate</td>
<td>94</td>
<td>58.0</td>
</tr>
<tr>
<td>Good</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

4.4.1 Health behaviors

Health behaviors included positive and negative behaviors. They were physical activity, cigarette smoking and alcohol drinking.

1. Physical activity

Duration and types of weekly physical activity were inquired to those participants. Only one - fourth (25.9%) reported having regularly of walking at least 30 minutes for 4-5 times a week. However, it was observed that 60.4% who never and rarely performed any physical activity. 34.5% reported of sitting in most of the time, and 63.5% responded that walking more than sitting as shown in Table 4.6

2. Cigarette smoking and alcohol drinking

 Majority of participants (94.4%) were those who never smoke. Currently smoke was 1.8%. In regards to alcohol drinking, 93.2 % was never drink and 0.6% were current drinker, as described in Table 4.6

Table 4.6 Health behaviors of 162 type 2 Diabetes

<table>
<thead>
<tr>
<th>Health behaviors</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>9</td>
<td>5.6</td>
</tr>
<tr>
<td>Rarely</td>
<td>89</td>
<td>54.9</td>
</tr>
<tr>
<td>Sometimes</td>
<td>22</td>
<td>13.6</td>
</tr>
<tr>
<td>Regularly</td>
<td>42</td>
<td>25.9</td>
</tr>
<tr>
<td>Types of physical activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Almost siting</td>
<td>56</td>
<td>34.6</td>
</tr>
<tr>
<td>Walking more than sitting</td>
<td>103</td>
<td>63.6</td>
</tr>
<tr>
<td>Walking as same as siting</td>
<td>3</td>
<td>1.9</td>
</tr>
</tbody>
</table>
4.5 Stress and stress management

Perceived on their own stress was inquired. 80.9% stress of respondents, 11.7% and 5.6% reported no stress and mild and moderate respectively. Only 1.9% having stress at a high level. Stress management e.g. participating in community/social activities such as meditation was inquired, 93.8% had never engaged in those activities as shown in Table 4.7

Table 4.7 Stress and adherence to medication of 161 type 2 Diabetes

<table>
<thead>
<tr>
<th>Level of stress</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>131</td>
<td>80.9</td>
</tr>
<tr>
<td>Mild</td>
<td>19</td>
<td>11.7</td>
</tr>
<tr>
<td>Moderate</td>
<td>9</td>
<td>5.6</td>
</tr>
<tr>
<td>High</td>
<td>3</td>
<td>1.9</td>
</tr>
</tbody>
</table>

Engage in social activities e.g. meditation, deep breathing

| Never | 152 | 93.8 |
| Rarely | 9 | 5.6 |
| Sometimes | 1 | 0.6 |

4.5.1. Eating practice

An overall of eating practice, 96.9% was at poor level, followed by 3.1% at fair level. It was observed that none of them was at good level of eating practice, as presented in Table 4.8

Table 4.8 Overall of level of eating practice among 162 type 2 Diabetes

<table>
<thead>
<tr>
<th>Eating practice</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>157</td>
<td>96.9</td>
</tr>
<tr>
<td>Fair</td>
<td>5</td>
<td>3.1</td>
</tr>
</tbody>
</table>
Considering the response to each item measuring eating practices, 17.6% regularly read nutritional label on the package of ready-to-eat food, followed by 44.1% rarely read and 13.9% never read the label. For color vegetable, 41.3% ate vegetable regularly, and 23.3% rarely ate vegetable. The response to less sugar fruits eating, 51.8% regularly ate less sugar fruits and 27.1% rarely ate. For high sugar fruits, 66.0% never ate and 14.2% ate it regularly. Dried fruits eating, 67.9% had never ate. For high fat food, 10.4% regular ate, and 32.7% sometimes ate. ate unhealthy food items. Fish which was always available in this area all year round, 59.8% informed of regular eating. Fermented fish, 88.8% reported regular eating. Adding fish or fermented fish sauce or monosodium glutamate to ready-to-eat food, 79.6% regular added to the foods. About half (45.6%) reported adding monosodium glutamate in daily cooking. Almost all (90.7%) had monosodium glutamate available at home and 84.0% informed eating delicatessen, and other instant food, as the detailed shown in Table 4.9.
Table 4.9 Eating practice of 162 type 2 diabetes

<table>
<thead>
<tr>
<th>Food intake</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Regular</th>
</tr>
</thead>
<tbody>
<tr>
<td>The nutrition label on the package</td>
<td>19</td>
<td>60</td>
<td>33</td>
<td>24</td>
</tr>
<tr>
<td>Color vegetables</td>
<td>4</td>
<td>34</td>
<td>57</td>
<td>67</td>
</tr>
<tr>
<td>Less sugar fruits</td>
<td>1</td>
<td>44</td>
<td>33</td>
<td>20.3</td>
</tr>
<tr>
<td>High sugar fruits</td>
<td>8</td>
<td>99</td>
<td>32</td>
<td>19.7</td>
</tr>
<tr>
<td>Dried fruits</td>
<td>110</td>
<td>44</td>
<td>7</td>
<td>4.3</td>
</tr>
<tr>
<td>High fat food</td>
<td>9</td>
<td>83</td>
<td>53</td>
<td>32.7</td>
</tr>
<tr>
<td>Fish</td>
<td>1</td>
<td>16</td>
<td>48</td>
<td>29.6</td>
</tr>
<tr>
<td>Fermented fish</td>
<td>3</td>
<td>8</td>
<td>7</td>
<td>4.3</td>
</tr>
<tr>
<td>Adding fish sauce or fermented fish or</td>
<td>5</td>
<td>14</td>
<td>14</td>
<td>8.6</td>
</tr>
<tr>
<td>Adding monosodium glutamate</td>
<td>21</td>
<td>53</td>
<td>14</td>
<td>8.6</td>
</tr>
<tr>
<td>Availability of monosodium glutamate at home</td>
<td>8</td>
<td>4</td>
<td>3</td>
<td>1.8</td>
</tr>
<tr>
<td>Put sugar in ready-to eat food</td>
<td>88</td>
<td>63</td>
<td>8</td>
<td>4.9</td>
</tr>
<tr>
<td>Eating delicatessen, and other instant food</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>136</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ref. code: 25606017090108UXQ
**Adherence to medical treatment**

Adherence to medical treatment included drugs adherence, follow up regular appointment and checking own blood sugar at home. An overall level of medical treatment adherence, 82.7% was at fair level, and 10.5% was poor level, whereas only 6.8% was good level as described in Table 4.10

Table 4.10 Overall level of adherence to medical treatment of 162 type 2 diabetes

<table>
<thead>
<tr>
<th>Adherence to medical treatment</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>17</td>
<td>10.5</td>
</tr>
<tr>
<td>Fair</td>
<td>134</td>
<td>82.7</td>
</tr>
<tr>
<td>Good</td>
<td>11</td>
<td>6.8</td>
</tr>
</tbody>
</table>

Adherence to medication included drugs intake and attended the DM clinic according to the appointments. In regards to checking his/her own blood sugar at home, 77.8% had never done, and only 6.2% had checked on regular basis. For drugs taken, 89.4% had never changed dose of medicine before consulting the doctors. Only 6.8% reported changing without consulting the doctor. About four-fifths (79.0%) took DM medicine regularly at the same time of the day, and 8.0% had not. Half of them had never travelled away from home. Among those reported ever travel, 98.1% forget taking DM medicine whenever they had to travel. Only 1.9% took over dose of medicine in the next day whenever forgotten. Almost all of the patients (94.4%) had never miss doctor’s appointment, and only 0.6 % regular miss an appointment, as the detailed shown in Table 4.11
<table>
<thead>
<tr>
<th>Adherence to medication</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Checking fasting blood sugar at home</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>126</td>
<td>77.8</td>
</tr>
<tr>
<td>Rarely</td>
<td>14</td>
<td>8.6</td>
</tr>
<tr>
<td>Sometime</td>
<td>12</td>
<td>7.4</td>
</tr>
<tr>
<td>Regular</td>
<td>10</td>
<td>6.2</td>
</tr>
<tr>
<td>Changing dose of drug before consult with doctor*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>144</td>
<td>88.9</td>
</tr>
<tr>
<td>Rarely</td>
<td>4</td>
<td>2.5</td>
</tr>
<tr>
<td>Sometime</td>
<td>2</td>
<td>1.2</td>
</tr>
<tr>
<td>Regular</td>
<td>11</td>
<td>6.8</td>
</tr>
<tr>
<td>Taking drug at the same time each day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>13</td>
<td>8.0</td>
</tr>
<tr>
<td>Rarely</td>
<td>8</td>
<td>4.9</td>
</tr>
<tr>
<td>Sometime</td>
<td>13</td>
<td>8.0</td>
</tr>
<tr>
<td>Regular</td>
<td>128</td>
<td>79.0</td>
</tr>
<tr>
<td>Ever travelled or leave home</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>81</td>
<td>50.0</td>
</tr>
<tr>
<td>Yes and bring diabetic drugs along</td>
<td>81</td>
<td>50.0</td>
</tr>
<tr>
<td>Ever forget taking the diabetic drugs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>159</td>
<td>98.1</td>
</tr>
<tr>
<td>Yes, and take over dose in the next day</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>Missing doctor’s appointment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>153</td>
<td>94.4</td>
</tr>
<tr>
<td>Rarely</td>
<td>6</td>
<td>3.7</td>
</tr>
<tr>
<td>Sometimes</td>
<td>2</td>
<td>1.2</td>
</tr>
<tr>
<td>Regular</td>
<td>1</td>
<td>0.6</td>
</tr>
</tbody>
</table>

* 161 valid cases
4.6 Social support

An overall level of family and peer support, the patients received support from family more than peer. About half (52.5%) received good level of support from family, but only 0.6% was in good level of support from peer, as shown in Table 4.12.

Table 4.12 Level of social support of 162 Type 2 Diabetes

<table>
<thead>
<tr>
<th>Social Support</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
</tr>
<tr>
<td>Family Support</td>
<td>85</td>
<td>52.5</td>
<td>66</td>
</tr>
<tr>
<td>Peer Support</td>
<td>1</td>
<td>0.6</td>
<td>9</td>
</tr>
</tbody>
</table>

The response to each item measuring family support, about half of the patients (49.3%) were always encouraged by his/her families to take medicine, 50.6% being reminded to take DM medicine. About three-fifths (58.6%) was always advised on having physical activities. Most of them (89.5%) was always supported whenever they had stress and problem, followed by 88.2% who always received love and care. For suggestion and advice, 79.0% always received and 78.4% said that they always received financial support from family, as described in Table 4.13.
Table 4.13 Number and percent of the responses to each item measuring social support of 162 type 2 diabetes

<table>
<thead>
<tr>
<th>Social Support</th>
<th>Never</th>
<th></th>
<th>Sometimes</th>
<th></th>
<th>Always</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td><strong>Family Support</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taking medicine advice</td>
<td>7</td>
<td>4.3</td>
<td>75</td>
<td>46.3</td>
<td>80</td>
<td>49.3</td>
</tr>
<tr>
<td>Taking medicine reminding</td>
<td>8</td>
<td>4.9</td>
<td>72</td>
<td>44.4</td>
<td>82</td>
<td>50.6</td>
</tr>
<tr>
<td>Physical activity advice</td>
<td>4</td>
<td>2.4</td>
<td>63</td>
<td>38.8</td>
<td>95</td>
<td>58.6</td>
</tr>
<tr>
<td>Financial support</td>
<td>3</td>
<td>1.8</td>
<td>32</td>
<td>19.7</td>
<td>127</td>
<td>78.4</td>
</tr>
<tr>
<td>Family advice</td>
<td>1</td>
<td>0.6</td>
<td>33</td>
<td>20.3</td>
<td>128</td>
<td>79.0</td>
</tr>
<tr>
<td>Love and care</td>
<td>1</td>
<td>0.6</td>
<td>18</td>
<td>11.1</td>
<td>143</td>
<td>88.2</td>
</tr>
<tr>
<td>Stress and problem</td>
<td>1</td>
<td>0.6</td>
<td>16</td>
<td>9.8</td>
<td>145</td>
<td>89.5</td>
</tr>
<tr>
<td><strong>Peer Support</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friend's support</td>
<td>47</td>
<td>29.0</td>
<td>99</td>
<td>61.1</td>
<td>16</td>
<td>9.8</td>
</tr>
<tr>
<td>Valuable information for health and wellbeing</td>
<td>62</td>
<td>38.2</td>
<td>85</td>
<td>52.4</td>
<td>15</td>
<td>9.2</td>
</tr>
<tr>
<td>Friends assistance whenever need</td>
<td>112</td>
<td>69.1</td>
<td>38</td>
<td>23.4</td>
<td>12</td>
<td>7.4</td>
</tr>
<tr>
<td>Friend's advice whenever need</td>
<td>103</td>
<td>63.5</td>
<td>37</td>
<td>22.8</td>
<td>22</td>
<td>13.5</td>
</tr>
<tr>
<td>Love and care</td>
<td>116</td>
<td>71.6</td>
<td>35</td>
<td>21.6</td>
<td>11</td>
<td>6.7</td>
</tr>
<tr>
<td>Stress or problem</td>
<td>103</td>
<td>63.5</td>
<td>49</td>
<td>30.2</td>
<td>10</td>
<td>6.1</td>
</tr>
<tr>
<td>Taking medicine remind</td>
<td>140</td>
<td>86.4</td>
<td>16</td>
<td>9.8</td>
<td>6</td>
<td>3.7</td>
</tr>
</tbody>
</table>

Ref. code: 25606017090108UXQ
4.7 Sources of DM information

93.8% of participants reported that they had received DM information. Majority of them (92.6%) had received from health care professionals, followed by family/friends (69.7%), and only 8.0% was from media. This information was weight control (95.6%), physical activity (87.0%), and regular blood sugar test (63.5%). 96.8% reported that they had ever received DM information from health care provider. Most of them (96.9%) they had attention from health care provider. Majority of them (93.2%) ever received DM knowledge on self-care. Majority of them (90.7%) had received DM information from television, followed by radio (88.2%). And only 7.4% was from internet. 15.4% of participants believed in the information received. And 10.5% followed information.

95.6% of participants reported that they ever heard advertisement on adherence to medical treatment. Majority of them (95.6%) had ever received those advertisements from television, and 89.5% ever heard from radio, followed by magazine 30.8%, and 9.8% received advertisement from the internet. 1.2% had received advertisement from community broadcasting tower as described in Table 4.14

Table 4.14 Sources of DM Information of 162 type 2 diabetes

<table>
<thead>
<tr>
<th>DM Information</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received information on diabetes mellitus</td>
<td>152</td>
<td>93.8</td>
</tr>
<tr>
<td>Health care professionals</td>
<td>150</td>
<td>92.5</td>
</tr>
<tr>
<td>Family, friends, other peoples</td>
<td>113</td>
<td>69.7</td>
</tr>
<tr>
<td>Media</td>
<td>13</td>
<td>8.0</td>
</tr>
<tr>
<td><strong>Known on self-care</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight control</td>
<td>155</td>
<td>95.6</td>
</tr>
<tr>
<td>Physical activities</td>
<td>141</td>
<td>87.0</td>
</tr>
<tr>
<td>Blood sugar test regularly</td>
<td>103</td>
<td>63.5</td>
</tr>
<tr>
<td>Smoking and drinking control</td>
<td>67</td>
<td>41.3</td>
</tr>
<tr>
<td>Complication prevention</td>
<td>11</td>
<td>6.7</td>
</tr>
</tbody>
</table>
Table 4.14 Sources of DM Information of 162 type 2 diabetes

<table>
<thead>
<tr>
<th>DM Information</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health provider's counselling whenever needed</td>
<td>156</td>
<td>96.8</td>
</tr>
<tr>
<td>Attention from health staff</td>
<td>157</td>
<td>96.9</td>
</tr>
<tr>
<td>Ever received DM's knowledge on self-care</td>
<td>151</td>
<td>93.2</td>
</tr>
<tr>
<td>Television</td>
<td>147</td>
<td>90.7</td>
</tr>
<tr>
<td>Radio</td>
<td>143</td>
<td>88.2</td>
</tr>
<tr>
<td>Magazine</td>
<td>59</td>
<td>36.4</td>
</tr>
<tr>
<td>Newspaper</td>
<td>23</td>
<td>14.2</td>
</tr>
<tr>
<td>Internet</td>
<td>12</td>
<td>7.4</td>
</tr>
<tr>
<td>Poster / Brochure</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Believed on information received</td>
<td>25</td>
<td>15.4</td>
</tr>
<tr>
<td>Not practiced as the information received</td>
<td>5</td>
<td>4.9</td>
</tr>
<tr>
<td>Practiced as the information received</td>
<td>17</td>
<td>10.5</td>
</tr>
<tr>
<td>Advertisement about diabetes drug, nutrient food information received</td>
<td>155</td>
<td>95.6</td>
</tr>
<tr>
<td>Television</td>
<td>155</td>
<td>95.6</td>
</tr>
<tr>
<td>Radio</td>
<td>145</td>
<td>89.5</td>
</tr>
<tr>
<td>Magazine</td>
<td>50</td>
<td>30.8</td>
</tr>
<tr>
<td>Newspaper</td>
<td>26</td>
<td>16.0</td>
</tr>
<tr>
<td>Internet</td>
<td>16</td>
<td>9.8</td>
</tr>
<tr>
<td>Poster / Brochure</td>
<td>3</td>
<td>1.8</td>
</tr>
<tr>
<td>Community broadcasting tower</td>
<td>2</td>
<td>1.2</td>
</tr>
</tbody>
</table>

* multiple response
4.8 Health care provider - patient communication

Doctor - patient communication, 45.9% perceived that the communication between patient and doctor was at good level. For nurse-patient communication, 48.8% was at good level. The patient perception on doctor-patient communication was better than the communication between nurse and patient, as shown in Table 4.15.

Table 4.15 Level of doctor- patient and nurse-patient communication of 162 Type 2 diabetes

<table>
<thead>
<tr>
<th>Communication</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctor-patient communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>86</td>
<td>53.1</td>
</tr>
<tr>
<td>Good</td>
<td>76</td>
<td>45.9</td>
</tr>
<tr>
<td>Nurse - patient communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>83</td>
<td>51.2</td>
</tr>
<tr>
<td>Good</td>
<td>79</td>
<td>48.8</td>
</tr>
</tbody>
</table>

Most of them (75.3%) who always received advice from doctor, and 24.0% sometime received. 74.0% reported that doctor clearly explained on adherence to medical treatment, 25.9% reported doctor sometime clearly explained. Over half of them 56.1% always understand of taking adherence, 43.8% sometimes understand of taking adherence. 27.1% of them reported doctor paid attention and most of them (72.8%) sometimes received attention from doctor. Only 15.4% of them reported doctor delivered related question and addressed. Majority of them 83.9% reported doctor sometimes delivered related question and addressed. 22.2% of them always ever received clarify on result from doctor, most of them 77.1% sometimes received clarify on result from doctor. 35.8% of them informed doctor always provided time for service, and 64.2% of them reported doctor sometime provided time for service. 43.2% of them ever received advice on self-care,
56.7% of them sometimes received advice on self-care from doctor. Half of them 50.0% reported nurse always paid attention for them, 50.0% sometime paid attention with them. 50.0% of them informed nurse always responded and explained whatever they want to know. 50.0% of them reported nurse sometime responded and explained whatever they want to know as presented in Table 4.16.

Table 4.16 Health care provider - patient communication of 162 type 2 Diabetes

<table>
<thead>
<tr>
<th>Health care provider</th>
<th>Never</th>
<th>Sometimes</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctor's advice on diabetes status.</td>
<td>1</td>
<td>39</td>
<td>122</td>
</tr>
<tr>
<td>Clear explanation on adherence</td>
<td>0</td>
<td>42</td>
<td>120</td>
</tr>
<tr>
<td>Adherence understanding</td>
<td>0</td>
<td>71</td>
<td>91</td>
</tr>
<tr>
<td>Doctor's attention</td>
<td>0</td>
<td>118</td>
<td>44</td>
</tr>
<tr>
<td>Delivery related questions and addresses</td>
<td>1</td>
<td>136</td>
<td>25</td>
</tr>
<tr>
<td>Clarify on result</td>
<td>1</td>
<td>125</td>
<td>36</td>
</tr>
<tr>
<td>Service provided time</td>
<td>0</td>
<td>104</td>
<td>58</td>
</tr>
<tr>
<td>Self-care practice advice</td>
<td>0</td>
<td>92</td>
<td>70</td>
</tr>
<tr>
<td>Nurse's attention</td>
<td>0</td>
<td>81</td>
<td>81</td>
</tr>
<tr>
<td>Nurse's response and explanation.</td>
<td>0</td>
<td>81</td>
<td>81</td>
</tr>
</tbody>
</table>

Ref. code: 25606017090108UXQ
4.9 Service satisfaction

Level of satisfaction to DM clinic, 83.3% was at good level as described in Table 4.17

Table 4.17 Level of satisfaction to service of 162 Type 2 Diabetes

<table>
<thead>
<tr>
<th>Level of satisfaction</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>27</td>
<td>16.7</td>
</tr>
<tr>
<td>Good</td>
<td>135</td>
<td>83.3</td>
</tr>
</tbody>
</table>

The results of the study revealed that 78.4% of patient was satisfied to doctor’s service, followed by very satisfaction was 13.5% and moderate was 8.0%. About 77.1% of them was satisfaction and very satisfaction was 14.8%. More than half of them 67.9% was satisfaction with doctor’s polite, humility, verbal speech. Only 0.6% was non-satisfaction with polite, humility, verbal speech. Health care provider’s knowledge 29.6% was satisfaction and very satisfaction 29.6%, followed by satisfaction was 63.0% and non-satisfaction was only 0.6% respectively. 71.0% of patients was satisfaction with self-care advice and very satisfaction was 23.4%. Patient reported that 38.3% was very satisfied, while 55.5% was satisfaction. About 48.2% informed they satisfied to the availability of health care provider service. And very satisfaction was 49.4%. More than half of the patients reported 63.0% was satisfaction. And very satisfaction was 33.3% with information clarification. More than half of them 76.5% was satisfaction while 20.4% was very satisfied to health care service system. About 80.9% was satisfied with health care facilitate. And very satisfaction was 17.9% as described in Table 4.18
Table 4.18 Number and percent of 162 type 2 Diabetes to each item measuring satisfaction to DM services

<table>
<thead>
<tr>
<th>Variables</th>
<th>Not satisfied</th>
<th>Moderate</th>
<th>Satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Health care providers services.</td>
<td>0</td>
<td>13</td>
<td>127</td>
<td>22</td>
</tr>
<tr>
<td>2. Polite, humility, verbal speech.</td>
<td>0</td>
<td>13</td>
<td>125</td>
<td>24</td>
</tr>
<tr>
<td>3. Respond and concern to the questions</td>
<td>1</td>
<td>9</td>
<td>110</td>
<td>42</td>
</tr>
<tr>
<td>4. Self-care practice advice.</td>
<td>1</td>
<td>8</td>
<td>115</td>
<td>38</td>
</tr>
<tr>
<td>5. Availability of health care provider service.</td>
<td>0</td>
<td>4</td>
<td>80</td>
<td>78</td>
</tr>
<tr>
<td>6. Health care service information received.</td>
<td>0</td>
<td>10</td>
<td>90</td>
<td>62</td>
</tr>
<tr>
<td>7. Honor and equality receive from health providers</td>
<td>0</td>
<td>7</td>
<td>55</td>
<td>100</td>
</tr>
<tr>
<td>8. Health care provider’s knowledge.</td>
<td>1</td>
<td>11</td>
<td>102</td>
<td>48</td>
</tr>
<tr>
<td>9. Clarity related information</td>
<td>0</td>
<td>6</td>
<td>102</td>
<td>54</td>
</tr>
<tr>
<td>10. The health care service system.</td>
<td>0</td>
<td>5</td>
<td>124</td>
<td>33</td>
</tr>
<tr>
<td>11. The health care facilitate</td>
<td>0</td>
<td>2</td>
<td>131</td>
<td>29</td>
</tr>
</tbody>
</table>

Ref. code: 25606017090108UXQ
4.10 Factors related to life-style modification

The analysis to identify factors related to life-style modification, eating practice and drugs and appointment practices of type 2 Diabetes were conducted as 1) crude analysis to find the relationship between each variable as shown in the conceptual framework by using either one-way ANOVA to compare mean of life-style modification by various categorical characteristics or Pearson correlation coefficient between each quantitative variable and life-style modification, eating practice and drugs and appointment practices, 2) selection variable from previous analysis based on P-values<0.30 were included in the multivariate regression analysis for life-style modification. The results of this part were presented as bivariate and multivariate analysis, as the followings.

4.10.1 Bivariate analysis of factors related for life-style modification

1) Comparison of mean score of lifestyle modification by various categorical independent variables

The non-significant different of mean score of life-style modification were identified the following variables: level of education, ever received DM information, personal counseling, problem give you advice, received information from radio, television and ever received an advertisement on diabetes drug (p-values>0.05). The statistical significance differences of life style modification were observed between sex and among six occupations (p-value=0.005 and 0.013 respectively). Life style differences among various levels of education were identified (p-value=0.013). Male had better life style than female. Those Diabetes who had completed a higher educational level had a better of their life style as compared to those less educated as described in Table 4.19.
Table 4.19 Comparison of life-style modification by various characteristics of type 2 diabetes

<table>
<thead>
<tr>
<th>Characteristics of DM Patient</th>
<th>Total samples</th>
<th>Mean</th>
<th>SEM</th>
<th>95% CI</th>
<th>p-value (^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>162</td>
<td>43.20</td>
<td>0.32</td>
<td>42.60</td>
<td>43.79</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.005</td>
</tr>
<tr>
<td>Male</td>
<td>82</td>
<td>44.06</td>
<td>0.35</td>
<td>43.39</td>
<td>44.74</td>
</tr>
<tr>
<td>Female</td>
<td>80</td>
<td>42.31</td>
<td>0.51</td>
<td>41.35</td>
<td>43.30</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.235</td>
</tr>
<tr>
<td>Unemployment</td>
<td>45</td>
<td>42.93</td>
<td>0.60</td>
<td>41.77</td>
<td>44.21</td>
</tr>
<tr>
<td>Public servants</td>
<td>36</td>
<td>44.56</td>
<td>0.59</td>
<td>43.43</td>
<td>45.67</td>
</tr>
<tr>
<td>Retired</td>
<td>11</td>
<td>43.18</td>
<td>1.91</td>
<td>38.89</td>
<td>46.70</td>
</tr>
<tr>
<td>Businessman/woman</td>
<td>9</td>
<td>41.33</td>
<td>1.56</td>
<td>38.29</td>
<td>44.18</td>
</tr>
<tr>
<td>Farmer</td>
<td>43</td>
<td>42.72</td>
<td>0.56</td>
<td>41.57</td>
<td>43.75</td>
</tr>
<tr>
<td>Worker</td>
<td>18</td>
<td>43.22</td>
<td>0.85</td>
<td>41.40</td>
<td>45.06</td>
</tr>
<tr>
<td>Level of education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.013</td>
</tr>
<tr>
<td>No school</td>
<td>27</td>
<td>43.48</td>
<td>0.52</td>
<td>42.57</td>
<td>44.54</td>
</tr>
<tr>
<td>Low (Primary school)</td>
<td>39</td>
<td>42.03</td>
<td>0.81</td>
<td>40.43</td>
<td>43.56</td>
</tr>
<tr>
<td>Medium (Secondary or high school)</td>
<td>49</td>
<td>42.59</td>
<td>0.54</td>
<td>41.50</td>
<td>43.60</td>
</tr>
<tr>
<td>High (University and higher)</td>
<td>47</td>
<td>44.64</td>
<td>0.52</td>
<td>43.59</td>
<td>45.56</td>
</tr>
</tbody>
</table>

\(^1\)95% CI by Bootstrap \(^2\) p-value by One-way ANOVA

2) Comparison of mean score of lifestyle modification by source of information on type 2 DM

The study revealed that life-style modification between those who received and never receive DM information were similar. In addition, score of personal counseling was not much different between those who received and not receive counselling (Mean 43.29 and 40.20). The scores of sources DM information likes problem give patient advice, receive information from radio, television, ever
advertisement diabetes drug was not much different between those who received and non-receive. The highest score was mean 43.3 and the lowest score was 40.20. However, those variables were non-significant associated as described in Table 4.20

Table 4.20 Comparison of average life style modification by source of information on type 2 diabetes

<table>
<thead>
<tr>
<th>Source of information</th>
<th>Sample size</th>
<th>Mean</th>
<th>SEM</th>
<th>95% CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ever received DM information</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>10</td>
<td>42.40</td>
<td>2.11</td>
<td>37.88</td>
<td>46.17</td>
</tr>
<tr>
<td>Yes</td>
<td>152</td>
<td>43.25</td>
<td>3.82</td>
<td>42.65</td>
<td>43.91</td>
</tr>
<tr>
<td>Personal counseling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>5</td>
<td>40.20</td>
<td>3.89</td>
<td>31.67</td>
<td>48.02</td>
</tr>
<tr>
<td>Yes</td>
<td>156</td>
<td>43.29</td>
<td>0.31</td>
<td>42.66</td>
<td>43.90</td>
</tr>
<tr>
<td>Problem give you advice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>157</td>
<td>43.29</td>
<td>0.30</td>
<td>42.70</td>
<td>43.88</td>
</tr>
<tr>
<td>Yes</td>
<td>5</td>
<td>40.20</td>
<td>3.89</td>
<td>31.67</td>
<td>47.79</td>
</tr>
<tr>
<td>Received in formation from Radio, television</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>137</td>
<td>43.17</td>
<td>0.34</td>
<td>42.48</td>
<td>43.80</td>
</tr>
<tr>
<td>Yes</td>
<td>25</td>
<td>43.36</td>
<td>0.85</td>
<td>41.61</td>
<td>45.10</td>
</tr>
<tr>
<td>Ever advertisement diabetes drug</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>7</td>
<td>41.43</td>
<td>2.44</td>
<td>35.83</td>
<td>45.00</td>
</tr>
<tr>
<td>Yes</td>
<td>155</td>
<td>43.28</td>
<td>0.31</td>
<td>42.64</td>
<td>43.88</td>
</tr>
</tbody>
</table>

195% CI by Bootstrap  2p-value by One-way ANOVA

3) Correlations between quantitative independent variables and eating practice, adherence to medication and life-style modification of type 2 Diabetes

Eating practice

BMI and satisfaction to services at DM clinic were negatively related to self-care practice on eating (r=-0.035, and -0.018) which means that the higher the BMI
and the more the satisfaction were the poorer the eating practice, but the relationship was not significant (p-values= 0.661 and 0.823 respectively). Variable that were positively correlated to self-care practice on eating were age, family support, peer support, doctor-patient communication and nurse and patient communication (r= 0.080, 0.111, 0.079, 0.067, 0.164 and 0.091 respectively), but the relationship between those variables were not significant (p-values= >0.05), except only doctor-patient communication was significantly related to eating practice (p-value=0.040). The more the doctor-patient communication was the better the patient practice on eating as described in Table 4.21

**Medical adherence**

Age, BMI, family support, peer support, doctor-patient communication and satisfaction to service at DM clinic were positively related to drug & appointment practices (r=0.054, 0.056, 0.028, 0.167, 0.037, 0.003 and 0.080), but the relationships were not significant (p-values >0.05). Variable that were negatively related to drug & appointment practices were duration of DM and nurse-patient communication (r= -0.027 and -0.168 respectively), but their relationships were not significant (p-value=0.316 and 0.258 respectively) as described in Table 4.21

**Life - style modification**

Those quantitative independent variables which were duration of DM, age, BMI, family and peer supports doctor-patient and nurse-patient communications were slightly positive related to life-style modification, but the relationships were not statistically significant (p-values >.05), except doctor-patient communication (p-value=0.017). The more that the doctor communicated with the patient was the better the life style of the patient as described in Table 4.21
Table 4.21 Correlation between quantitative independent variables and eating practice, adherence to medication and life-style modification of 162 diabetes

<table>
<thead>
<tr>
<th></th>
<th>Eating practice</th>
<th>Adherence to medication</th>
<th>Life style modification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
<td>p-value¹</td>
<td>95% CI²</td>
</tr>
<tr>
<td><strong>Duration of DM</strong></td>
<td>.080</td>
<td>.316</td>
<td>-.051</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>.111</td>
<td>.166</td>
<td>-.064</td>
</tr>
<tr>
<td><strong>BMI</strong></td>
<td>-.035</td>
<td>.661</td>
<td>-.217</td>
</tr>
<tr>
<td><strong>Social support</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family support</td>
<td>.079</td>
<td>.322</td>
<td>-.062</td>
</tr>
<tr>
<td>Peer support</td>
<td>.067</td>
<td>.403</td>
<td>-.150</td>
</tr>
<tr>
<td><strong>Healthcare provider-patient communication</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctor-patient</td>
<td>.164</td>
<td>.040</td>
<td>-.038</td>
</tr>
<tr>
<td>Nurse-patient</td>
<td>.091</td>
<td>.258</td>
<td>-.057</td>
</tr>
<tr>
<td><strong>Satisfaction to service at DM</strong></td>
<td>-.018</td>
<td>.823</td>
<td>-.182</td>
</tr>
</tbody>
</table>

¹95% 2-tailed p-value by t-test  ²95% CI by Bootstrap
From multiple regression analysis of factors related to life-style modification of type 2 diabetes as shown in Table 4.20. Sex, age, occupation, education, family income, duration of DM, social support, healthcare provider communication was entered into the multiple regression model. Dummy variables were set up for occupation and educational level. For quantitate predictors, actual measurement was put into the multiple regression model as shown in Table 4.21.

Life-style modification of male was better than female DM participant when control for other variables in the model. Age, occupation, educational status, family income, duration of DM, family and peer support, and nurse-patient communication were not significantly related to life style modification when control for other variables in the model. Doctor-patient communication was significantly associated to life style modification, the more the patient perceived of having more communication with doctor at the DM clinic was the better the life style when control for other variables in the model. All predictors in the model was able to explain the variation of life style modification 20.0%, as shown in Table 4.22.
Table 4.22 Multiple linear regression analysis of factors related to life style modification of 158 type 2 diabetes

<table>
<thead>
<tr>
<th>Variable</th>
<th>b</th>
<th>SE(b)</th>
<th>b Standardized</th>
<th>p-value</th>
<th>95.0% CI for B</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>35.16</td>
<td>3.44</td>
<td>0.00</td>
<td>0.000</td>
<td>28.35 to 41.96</td>
</tr>
<tr>
<td>Sex (0=Female, 1=Male)</td>
<td>1.31</td>
<td>0.69</td>
<td>0.16</td>
<td>0.060</td>
<td>-0.06 to 2.68</td>
</tr>
<tr>
<td>Age (years)</td>
<td>0.00</td>
<td>0.04</td>
<td>0.00</td>
<td>0.958</td>
<td>-0.08 to 0.08</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occ1</td>
<td>-1.40</td>
<td>1.62</td>
<td>-0.16</td>
<td>0.390</td>
<td>-4.61 to 1.81</td>
</tr>
<tr>
<td>Occ2</td>
<td>-2.26</td>
<td>1.78</td>
<td>-0.13</td>
<td>0.205</td>
<td>-5.78 to 1.25</td>
</tr>
<tr>
<td>Occ3</td>
<td>0.46</td>
<td>0.98</td>
<td>0.05</td>
<td>0.643</td>
<td>-1.48 to 2.39</td>
</tr>
<tr>
<td>Occ4</td>
<td>1.19</td>
<td>1.33</td>
<td>0.09</td>
<td>0.373</td>
<td>-1.44 to 3.82</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educ1</td>
<td>-1.80</td>
<td>1.02</td>
<td>-0.19</td>
<td>0.081</td>
<td>-3.82 to 0.23</td>
</tr>
<tr>
<td>Educ2</td>
<td>-1.45</td>
<td>1.10</td>
<td>-0.17</td>
<td>0.188</td>
<td>-3.63 to 0.72</td>
</tr>
<tr>
<td>Educ3</td>
<td>1.83</td>
<td>1.64</td>
<td>0.21</td>
<td>0.266</td>
<td>-1.41 to 5.06</td>
</tr>
<tr>
<td>Family income (million kip a month)</td>
<td>-0.16</td>
<td>0.60</td>
<td>-0.03</td>
<td>0.784</td>
<td>-1.35 to 1.02</td>
</tr>
<tr>
<td>Duration of DM in years</td>
<td>0.18</td>
<td>0.10</td>
<td>0.14</td>
<td>0.074</td>
<td>-0.02 to 0.37</td>
</tr>
<tr>
<td>Social Support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family support</td>
<td>0.19</td>
<td>0.16</td>
<td>0.10</td>
<td>0.224</td>
<td>-0.12 to 0.50</td>
</tr>
<tr>
<td>Peer support</td>
<td>0.04</td>
<td>0.10</td>
<td>0.03</td>
<td>0.719</td>
<td>-0.16 to 0.23</td>
</tr>
<tr>
<td>Healthcare provider communication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctor-patient</td>
<td>0.58</td>
<td>0.17</td>
<td>0.30</td>
<td>0.001</td>
<td>0.24 to 0.92</td>
</tr>
<tr>
<td>Nurse-patient</td>
<td>-0.55</td>
<td>0.35</td>
<td>-0.14</td>
<td>0.117</td>
<td>-1.23 to 0.14</td>
</tr>
</tbody>
</table>

R = 0.447 \quad R^2=0.200 \quad R^2(adj)= 0.116

\sqrt{\text{MSE}} = 3.761 \quad \text{p-value}=0.005
Dummy variables for occupation and level of education

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Occ1</th>
<th>Occ2</th>
<th>Occ3</th>
<th>Occ4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Public servants-Retired</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Businessman</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Farmer</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Worker</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education</th>
<th>Educ1</th>
<th>Educ2</th>
<th>Educ3</th>
</tr>
</thead>
<tbody>
<tr>
<td>No school</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Primary</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Secondary</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>University</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

4) Correlation between eating practice, adherence to medication, lifestyle modification and fasting blood sugar

The relationship between overall lifestyle modification, eating practices and adherence to medical treatment and fasting blood sugar were analyzed by using an average of fasting blood sugar at 3 visits were calculated. Slightly positive relationships were found between overall lifestyle and adherence to medical treatment and fasting blood sugar ($r=0.067$ and $0.089$ respectively), but the relationships were not significant ($p=0.399$ and $0.266$ respectively. For eating practices and fasting blood sugar, the negative correlation was identified but the was not also significant ($r=-0.016$, $p$-value $=0.843$) as shown in Table 4.23. It could be summarized that lifestyle modification was not related to fasting blood sugar.
Table 4.23 Pearson correlation between overall lifestyle modification, eating practices and adherence to medical treatment and fasting blood sugar of 159 type 2 diabetes

<table>
<thead>
<tr>
<th>Life style modification</th>
<th>r</th>
<th>p-value(^1)</th>
<th>95%CI(^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>LL</td>
</tr>
<tr>
<td>Overall</td>
<td>0.067</td>
<td>0.399</td>
<td>-0.072, 0.208</td>
</tr>
<tr>
<td>Eating practices</td>
<td>-0.016</td>
<td>0.843</td>
<td>-0.148, 0.129</td>
</tr>
<tr>
<td>Adherence to medical treatment</td>
<td>0.089</td>
<td>0.266</td>
<td>-0.057, 0.213</td>
</tr>
</tbody>
</table>

\(^1\)p-value by t-test \(^2\) 95\%CI by bootstrap

**4.10 Discussion**

The discussion of the result relevant to conceptual framework and research questions were described as following: Life-modification among type 2 diabetes, personal characteristics, social support, source of DM information and health care provider.

**Personal characteristics**

In this study showed that male type 2 DM patient more than female. One study revealed that male had significantly higher than female (P < 0.001).\(^{64}\) Two finding was quite similarity, but the association between gender has been not found in this study (p-value=0.005). Life-style modification of male in Champasak province seemed better than female. However, male type 2 DM patient more than female. On other hand, eating behavior of male was diffident from male according to Champasak context.

Based-on finding 39.5% of participants aged between 50-59 years was type 2 Diabetes than others age groups. Thus, those group are not taking care to diet control, eating high fat food, beef, delicatessen, and other instant food, sodium in to read-to eat food, adding monosodium glutamate at home and availability of monosodium glutamate at home. Only 29.0% of participants had university and higher education. It seemed that they were poor life-modification due to low education and participants has limitation of accessibility to DM information. 27.7% of participant was unemployment, they had low monthly income which may affect to life-style modification. On the other hand, it seemed factors related to poor life-style modification in this finding, but
occupation was non-significantly associated. In addition, 46.3% of participant had low income (Lower than 1,000,000 Kip). It showed that nearly half of participant had low income. Thus they are not taking care for diet control. Other study showed that occupation was significant associated to self-care practice on eating. Higher household income level may also be linked to better diabetes self-management practice.\(^{(64)}\) On the other hand, 37.3% of participant was pre-obese, overweight 20.5% and 2.5% was obesity. From those finding showed that participant had high risk to complications and co-mobility, but it was non-significant, the other study showed that there were no significant differences in weight, BMI between groups of different BMI (p-values =0.046) \(^{(69)}\). In order to control BIM of type 2 DM patient health provider should provide clearly advice to avoid unhealthy food such as high fat food, and reducing fish sauce and fermented fish or sodium in to ready-to-eat food and delicatessen and other instant food. Physical activity at least 20-30 minutes a day and 3 days a week. Health providers should train person who are a cooker in type 2 DM patient’s family. In term of appropriated menu for type 2 DM patient. Not adding monosodium glutamate and not availability monosodium glutamate at home. Furthermore, Monitoring & evaluation can be performed especially home visit activity, eating and cooking practice.

**Social support**

The study showed that peer support was very poor (92.0%). However, family support was still good level (52.5%). Patients with peer support group experienced a significant associated (P-values = 0.045.) Also. Another related study revealed that peer support can be successfully applied in diabetes self-management.\(^{(70)}\) results show that peer support never remind participants taking medicine, and never advice when they had problem. In addition, peer never care and love and peer never assistant and advice whenever need. In order to make better intervention, Champasak Hospital together with health committee can organize exchange type 2 DM self-care experience among Diabetes, counselling from health provider and network setting. Type 2 MD working group should be performed including hospital, district and village levels. However, family support was good, but health providers have to promote family support patient on taking drug on time, remind them to exercise, and family have to care and accompany for doctor’s appointment. Family should closely take care and give advice whenever they get stress in order to reduce control fasting blood sugar.
Sources of DM information

In this study results source of type 2 DM patient have limitation which is only from radio and television, it seemed that source of DM information was factor related but non-significantly associated. Other study revealed that television are the primary sources of health-related information for adult diabetic patients in Saudi Arabia whether they seek health-related information online or not. This study demonstrates that participants seeking online health-related information are more conscious about their diabetes self-care compared to non-health-related information seekers in some aspects more than the others. (71). Since sources of DM information were from radio and television, DM information and life-style modification, complication prevention, regularly blood sugar test and maintain clan physical can be included to television and radio twice time a day and every day. In rural area, community health committee have to provide that information through community broadcasting town at least 2 time a day (morning and evening). In addition, home visit and monitoring & evaluation can be conducted in quarterly.

Health care provider.

As the result of this study revealed that doctor-patient communication was significantly factor related to self-care especially on eating practice, but non-significant by associated on adherence medication. It was similar to a related study found that a good relationship and between health care providers and patient were associated with self-care practice. (50). Doctor’s appointment was not good, patient not follow an appointment. So doctor should take time with each case, provide clearly information and make sure that they get the right information. In order to miss an appointment, family member should be with patients when doctor inform an appointment date and time. So they can remind and accompany at that time. Health care providers should advice clearly adherence to medication by clearly note in dose package, family member have to monitor every time before taking drug. Health provider can explain harmful of not taking drug on time. In addition, nurse should be polite, humility when communicate with patients. 49.4% of participant satisfied of availability of health provider service and 34.0% of participant satisfied with honor and equality receive from health care providers. DM clinic should be available doctor all the time. Health provider should provide equality of time. Furthermore, health care provider has to suggest them
to check diabetic retinopathy, diabetic amputation and diabetic nephropathy in order to avoid complication.

**Life-style modification among type 2 DM patient**

**Eating practice**

Based-on study result, 96.9% of participant eating practice was very poor. Furthermore, over half of participant ate less sugar fruit, most of them ate fermented fish, 79.6% regular added sodium in to ready-to eat food, 45.6% of participant regular added monosodium glutamate and mostly of them availability of monosodium glutamate at home. Participant was framer and worker, some of them was unemployment. Male had better life-style modification more than female and 39.5% of participant aged 50-59 years. those was likely to be factors related to eating practice. In order to make better eating practice. Health care providers should provide information on harmful of eating fermented fish, fish sauce, monosodium glutamate, high fat food, alcohol beverage, smoking and Coca-Cola. In addition, guideline of eating practice should be promoted to prevent diabetes and its complication such as health care providers have to advice those guidelines to type 2 DM patient every time after meeting doctor. It made better self-care practice on eating, adherence to medication and life-style modification. It was quite similar to this study as family support was not significant associated, especially in areas with a shortage of professionals and economic resources.\(^{(49)}\)

**Adherence to medication**

77.8% of participant never check fasting blood sugar at home. 6.8% changed dose of drug before consulting with doctor and 8.0% took drug at the same time each day. In addition, mostly of them 98.1% forgot taking the diabetic drug when travelling. Beside that 0.6% of participant regular missing doctor’s appointment. It can be concluded that level of adherence to medication was fair and good was only 6.8%. Other study found that adherence to medication was good (94.8%) and 5.2% was fair, the study also found that most of participant regular follow doctor’s advice. Due to samples was elderly. Participant honor and respect doctor and nurse which influenced to make better on adherence to medication. \(^{(64)}\)
Physical activity

Results were that 29.5% of participant regularly physical activity, 34.5% of participant almost sitting. Some of participant were current smoking and drinking alcohol. It can be concluded that participant was unphysical activity. Due to type 2 Diabetes at Champasak Hospital is sedentary life-style modification. Other study found that increasing physical activities has been suggested to controlling of glycemic level. It was also found that the increasing of physical activities was significantly related to duration of being diagnosed as DM. This result agrees with study on predicting controllability of glycemic level among type 2 DM in sisaket Hospital.\(^{(11)}\) Other study showed that 50.0% of participant did exercise and 43.3 % regular exercise, they walk and quickly walk, run and other physical activities 20-30 minutes per one time.\(^{(64)}\) Exercise venues should have at Champasak Hospital and central area of community and exercise guideline can be presented at public park as well.

Result found that FBS on last 3 visits among participants was high. The majority of participants had FBS level between 200 – 299.99 mg/dl. Moreover, this study found that 34 % among participants had FBS level at 300 mg/dl. It was very high of 3 visit among Champasak type 2 diabetes nowadays. Those are risk to have complication due to FBS level between 200-299.99 mg/dl. It seemed that they lack of self-care practice. BMI (p≤0.001), and triglycerides (p≤0.001) but not for physical activity. Improvements in weight and blood glucose were significantly higher in men than in women. In general, after adjusting for gender, reductions in blood glucose were positively related to weight loss - the higher the weight loss, the greater the improvement in blood glucose. This study agreed together that fasting blood sugar is important factor related to self-care practice.
CHAPTER 5
CONCLUSION AND RECOMMENDATIONS

The aims of the study assessed life-style modification and factors related to life-style modification among Diabetes whose aged were 35 years or older at Champasack hospital Champasack province, LAO PDR. Data collection was conducted by face to face interview with standardized questionnaires. All of respondents were total 162 participants. Data collection was performed in April 2018. And data entry was done by Epidata version 3.1. Multiple regression was used to find association between related factors and life-style modification. The results of the study are presented as following:

5.1 Conclusion

The study revealed that eating behavior of participants was not in good level. Participant was not aware of nutritional label on package. However, Diabetes reported that they regularly had less sugar fruits. The study found that perception of dietary control was still poor on dietary control. This study found doctor-patient communication was significantly associated with life-style modification. Which showed that clearly communication between doctor-patient was a significant factor related. Peer support was very poor (92.0%) while family support was in good level (52.5%). The study showed the different of family and peer support. Furthermore, life-style modification was poor. Level of satisfaction of participants was very good to DM clinic service. The study informed that patient had low education unemployment and low family income. These might have led them to poor self-care practice. Furthermore, this study reported that most of participants received DM information from family & peer. They can access DM information from television. Participant were not good at self-care practice. However, mostly of participants had limited knowledge on complication prevention. In addition, mostly of participants had fasting blood sugar in high level. Current visit was uncontrollable 96.3%, last 6 months’ visit was uncontrollable 92.0% and last 3 months visit was uncontrollable 93.7% respectively.
Body mass index of participants found that overweight was 20.5% and pre-obese 37.2%, it can be concluded that nearly half of participants easily risk factor to complications. Furthermore, result showed that level of eating behavior was very poor. Whereas adherence to medication of participant 82.7% was fair and only 6.8% was good.

The most important factor related to life-style modification was doctor-patient communication. In addition, the study result showed that health care provider was in poor level.

5.2 Recommendations

5.2.1 Recommendation for implementation
- Health care providers especially doctor or nurse can communicate to type 2 diabetes to change their life-styles such as eating behavior, and physical activity in order to control type 2 DM.
- FBS among type 2 diabetes was high. Hence, urgent advice on controlling blood sugar is needed among patients. Moreover, further investigation on FBS test and duration of fasting might be necessary to identify this problem.

5.2.2 Recommendation for further study
- Further studies should evaluate quality of life among type 2 diabetes, particularly in dietary and weight control.
- Further studies can focus on health literacy among type 2 diabetes.
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ADDENDICES
APENDIX A

Questionnaire

Social support and life-style modification among type 2 diabetes mellitus patients
at Champasack Hospital, Lao PDR

ID number: ............... Date of data collection: ........../....../......
Patient’s HN: ..............................................................

Part I: Patient’s hospital record
Date of DM diagnosed dd........ / month ........ / yyyy ...........
Duration of DM diagnosis .......... Months .......... Years
Weight _____ _____ kg Height _____ _____ cm
FBS1 ........................................ (date of FBS1 date....../month ....../year .........)
FBS2 ........................................ (date of FBS2 date....../month ....../year .........)
FBS3 ........................................ (date of FBS3 date....../month ....../year .........)
History of Complication
□ 1 No
□ 2 Yes ☐ 1) Type of complications
☐ 1 hypertension ☐ 2 Diabetic retinopathy
☐ 3 Nephropathy ☐ 4 Diabetes amputation
☐ 5 Other (specify) ..................................................

☐ 2) Frequency of complications ........ times

☐ 3) Date of last complication: date....../month ....../year .........
Number of admitted as inpatient ...... times
Date of last admitted? date...... /month ...... /year .......

Part II: Personal factors

Instruction: The questions below should take about 15 minutes to answer.

There are no right or wrong answer to many questions? Some questions ask for your
opinions or choices that best describe your personal experience.
2.1 Dated of birth……/……/……. Age ………years old

2.2 Sex □¹ Male □² Female

2.3 Education level:
□¹ No school □² Low (Primary school) □³ Medium (Secondary or high school) □⁴ High (University and higher) □⁵ Others (specify) ……………………………

2.4 Occupation:
□¹ Unemployment □² Public servants □³ Retired □⁴ Businessman/woman □⁵ Farmer □⁶ Worker □⁷ Others (specify) ……………………………

2.5 Family income (per month) ………………… kip/month
□¹ <1,000,000 kip/month □² 1,000,000 – 2,500,000 kip/month □³ 2,500,000-5,000,000 kip/month □⁴ 5,000,000-10,000,000 kip/month

2.6 Are you a member of health insurance?
□¹ No
□² Yes ☐ If “yes”, please specify type of health security.
☐¹ Government health insurance ☐² Enterprise health insurance ☐³ General population health insurance ☐⁴ Other (specify) ………

2.7 How long have you been diagnosed DM type II DM? ……. years …….. months

Part III: Lifestyle modification

3.1 Take part in regular physical activity (30 minutes of walking 4-5 times per week)
□¹ Never □² Rarely □³ Sometime □⁴ Regular □⁵ Other (specify) ……………………………

3.2 What kind of your daily physical activities?
□¹ almost siting □² walking more than sitting □³ walking as same as siting

3.3 Do you smoke?
□¹ Never
□² Quit smoking ☐ When did you quit how long ago? … years … months ago
□³ Current smoking ☐ As compare to other smokers, what is your level of smoking?
□¹ Light smoker □² Moderate smokers □³ Heavy smoker
☐ Amount of smoking as compare to 6 months ago.
3.4 Do you drink alcohol?
□️ 1 Lesser than 6 months ago □️ 2 Same as 6 months ago □️ 3 More than as 6 months ago

□️ 1 Never
□️ 2 Quit drinking ☝️ When did you quit? ….. years …… months ago
□️ 3 Current drinking ☝️ As compare to other drinkers, what is your level of drinking?
□️ 4 Light drinker □️ 5 Moderate drinker □️ 6 Heavy drinker

☝️ Amount of drinking as compare to 6 months ago.
□️ 1 Lesser than 6 months ago □️ 2 Same as 6 months ago □️ 3 More than as 6 months ago

3.5 Have you ever bought delicatessen e.g Mama, Yum Yum, Wai Wai?
□️ 1 No
□️ 2 Yes ☝️ Have you ever read nutrition label, especially amount of sodium?
□️ 1 Never □️ 2 Rarely □️ 3 Sometime □️ 4 Regular

3.6 Do you eat a variety of colorful vegetables?
□️ 1 Never □️ 2 Rarely □️ 3 Sometime □️ 4 Regular

3.7 Do you eat less sugar fruits?
□️ 1 Never □️ 2 Rarely □️ 3 Sometime □️ 4 Regular

3.8 Do you eat sweet fruits?
□️ 1 Never □️ 2 Rarely □️ 3 Sometime □️ 4 Regular

3.7 Do you eat dry fruits?
□️ 1 Never □️ 2 Rarely □️ 3 Sometime □️ 4 Regular

3.9 Do you eat oily food?
□️ 1 Never □️ 2 Rarely □️ 3 Sometime □️ 4 Regular

3.10 Do you eat fish?
□️ 1 Never □️ 2 Rarely □️ 3 Sometime □️ 4 Regular

3.11 Do you eat fermented fish?
□️ 1 Never □️ 2 Rarely □️ 3 Sometime □️ 4 Regular

3.12 Do you added fish sauce or fermented fish sauce or sodium in the ready to eat food before eating?
□️ 1 Never □️ 2 Rarely □️ 3 Sometime □️ 4 Regular
3.13 Do you add monosodium glutamate in any kind of food you eat?
   □ 1 Never □ 2 Rarely □ 3 Sometime □ 4 Regular
3.14 Do you have monosodium glutamate in your kitchen?
   □ 1 Never □ 2 Rarely □ 3 Sometime □ 4 Regular
3.15 Do you add sugar in the ready food?
   □ 1 Never □ 2 Rarely □ 3 Sometime □ 4 Regular
3.16 Check your fasting blood sugar at home.
   □ 1 Never □ 2 Rarely □ 3 Sometime □ 4 Regular
3.17 Have you ever changed dose of drug by yourself?
   □ 1 Never □ 2 Rarely □ 3 Sometime □ 4 Regular
3.18 Do you take drugs at the same time each day?
   □ 1 Never □ 2 Rarely □ 3 Sometime □ 4 Regular
3.19 Have you ever travel or leave home?
   □ 1 No
   □ 2 Yes ☐ Do you bring diabetes drugs along?
      □ 1 Never □ 2 Rarely □ 3 Sometime □ 4 Regular
3.20 Have you ever forgotten to take diabetic drug?
   □ 1 No
   □ 2 Yes ☐ 1) How often did you forget on average in a week? …….. days
       2) How do you do after recall?
          ☐ 1 Take immediately after recall ☐ 2 Take over dose in next day
          ☐ 3 Other (specify)…………………………
3.21 Do you have stress in the last 3 months?
   □ 1 No
   □ 2 Yes ☐ 1) What was your stress level? ☐ 1 mild ☐ 2 moderate ☐ 3 high
       2) Frequency of stress on average in a week. ………… Days/week
3.22 Do you engage in activities e.g. meditation, deep breathing that can lower stress?
   □ 1 Never □ 2 Rarely □ 3 Sometime □ 4 Regular
3.23 Have you ever missed doctor appointment?
   □ 1 Never □ 2 Rarely □ 3 Sometime □ 4 Regular
Part IV: Social Support

The researcher would like to know about the feeling of support from your family and peer. Please check the answer that comes closest to how you have felt.

4.1 Family Support

1. Your family encourage you to take medicine
   - □ 1 Never   □ 2 Sometimes   □ 3 Always
2. Your family members always remind you on taking medicine
   - □ 1 Never   □ 2 Sometimes   □ 3 Always
3. Your family encourages you to have more physical activity
   - □ 1 Never   □ 2 Sometimes   □ 3 Always
4. Financial support to buy medication and other essential things from family
   - □ 1 Never   □ 2 Sometimes   □ 3 Always
5. Your family members provide advices and suggestions whenever you need
   - □ 1 Never   □ 2 Sometimes   □ 3 Always
6. Your family members give you love and care
   - □ 1 Never   □ 2 Sometimes   □ 3 Always
7. Your family members give support whenever you get distress or problem
   - □ 1 Never   □ 2 Sometimes   □ 3 Always

4.2 Peer support:

1. Your friends listen and give advice whenever you talk about your problem and the challenges you face
   - □ 1 Never   □ 2 Sometimes   □ 3 Always
2. Your friends give you valuable information for your health and wellbeing
   - □ 1 Never   □ 2 Sometimes   □ 3 Always
3. Your friends give you an assistance whenever you need
   - □ 1 Never   □ 2 Sometimes   □ 3 Always
4. Your friends provide advices and suggestions whenever you need
   - □ 1 Never   □ 2 Sometimes   □ 3 Always
5. Your friends give you love and care
   - □ 1 Never   □ 2 Sometimes   □ 3 Always
6. Your friends give support whenever you get distress or problem
   □ 1 Never   □ 2 Sometimes   □ 3 Always

7. Your friend reminds you taking medicine
   □ 1 Never   □ 2 Sometimes   □ 3 Always

**Part V: Sources of DM Information**

5.1 Did you receive any information on diabetes mellitus?
   □ 0 No
   □ 1 Yes  ❍ If yes, where did you get that information?
   □ 1 Health care professionals   □ 2 Family, friends, other peoples   □ 3 Media

5.3 What do you know about self-care? (Multiple response)
   ○ 1 Eating for weight control   ○ 2 Physical activities should do
   ○ 3 Complication preventions   ○ 4 Avoiding smoking, drinking
   ○ 5 Sugar in blood and urine measurement   ○ 6 Others...........................

5.4 Health personnel always provide you counseling whenever you need.
   □ 1 No   □ 2 Yes

5.5 Health staffs listen your problem and give you an advice on how to solve them.
   □ 1 No   □ 2 Yes

5.8 Have you ever heard about self-care practice of type II diabetes?
   □ 1 No
   □ 2 Yes  ❍ Which media you have ever seen?
   ○ 1 Magazine   ○ 2 Radio   ○ 3 Television
   ○ 4 Internet   ○ 5 Newspaper   ○ 6 Poster / Brochure
   ○ 7 Other (specify).................................................................

5.9 Do you believe the information from radio, television, speaker?
   □ 0 No
   □ 1 Yes  ❍ you follow that information?
   □ 0 Not follow   □ 1 Follow

5.10 Have you ever seen any advertisement about diabetes drug, nutrient food that you received?
   □ 0 No
   □ 1 Yes  ❍ what kind of medias? (Multiple responses)
   ○ 1 Magazine   ○ 2 Radio   ○ 3 Television
Part VI: Health care provider – patient communication

Health care provider and Physician-patient communication: consists of 1 to 10 items in a 5 points Likert scale ranging from 1= never to 5= always. Except for the first two items in which the scale is reversed. The score criteria for the physician-patient communication:

**Doctor communication**

6.1 Your doctor informs you about your diabetes status.

☐ 1 Never  ☐ 2 Sometimes  ☐ 3 Always

6.2 Your doctor at this hospital explains to how to take medicine.

☐ 1 Never  ☐ 2 Sometimes  ☐ 3 Always

6.3 You are in trouble understanding your doctor explanation on how to take medicine.

☐ 1 Never  ☐ 2 Sometimes  ☐ 3 Always

6.4 Your doctor pay attention to your response and explanation.

☐ 1 Never  ☐ 2 Sometimes  ☐ 3 Always

6.5 Your doctor answers to your questions and addresses your concern.

☐ 1 Never  ☐ 2 Sometimes  ☐ 3 Always

6.6 Your doctor thoroughly explains why a test was being done.

☐ 1 Never  ☐ 2 Sometimes  ☐ 3 Always

6.7 Your doctor has time for to you

☐ 1 Never  ☐ 2 Sometimes  ☐ 3 Always

6.8 Your doctor explains what you need to do to take care of your diabetes.

☐ 1 Never  ☐ 2 Sometimes  ☐ 3 Always

**Nurse communication**

6.9 Nurses answers to your questions and addresses your concern.

☐ 1 Never  ☐ 2 Sometimes  ☐ 3 Always

6.10 Nurses pay attention to your response and explanation.

☐ 1 Never  ☐ 2 Sometimes  ☐ 3 Always
We would like to know the satisfaction level of Health care provider clinic services. Satisfaction level: 1= not very satisfied, 2= not satisfied, 3= moderate, 4= satisfied, 5= very satisfied

<table>
<thead>
<tr>
<th>No</th>
<th>Statement</th>
<th>Satisfaction level</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.11</td>
<td>Health care providers services</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>6.12</td>
<td>Polite, humility, verbal speech</td>
<td>□ 1 □ 2 □ 3 □ 4 □ 5</td>
</tr>
<tr>
<td>6.13</td>
<td>Responding to your concerns and relatives willingly</td>
<td>□ 1 □ 2 □ 3 □ 4 □ 5</td>
</tr>
<tr>
<td>6.14</td>
<td>Provide information whenever you take care yourself</td>
<td>□ 1 □ 2 □ 3 □ 4 □ 5</td>
</tr>
<tr>
<td>6.15</td>
<td>Knowledge how to provide information and service</td>
<td>□ 1 □ 2 □ 3 □ 4 □ 5</td>
</tr>
<tr>
<td>6.16</td>
<td>You get information about the health care service area</td>
<td>□ 1 □ 2 □ 3 □ 4 □ 5</td>
</tr>
<tr>
<td>6.17</td>
<td>You get to honor and equality from health care providers</td>
<td>□ 1 □ 2 □ 3 □ 4 □ 5</td>
</tr>
<tr>
<td>6.18</td>
<td>Availability of health care provider service</td>
<td>□ 1 □ 2 □ 3 □ 4 □ 5</td>
</tr>
<tr>
<td>6.19</td>
<td>Clarity to improving information and answering the your concerns</td>
<td>□ 1 □ 2 □ 3 □ 4 □ 5</td>
</tr>
<tr>
<td>6.20</td>
<td>The health care service system</td>
<td>□ 1 □ 2 □ 3 □ 4 □ 5</td>
</tr>
<tr>
<td>6.21</td>
<td>The health care situation place</td>
<td>□ 1 □ 2 □ 3 □ 4 □ 5</td>
</tr>
</tbody>
</table>

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APPENDIX B

Form of
Patient/Participant Information Sheet

Instruction:
Need to use simple language, avoid technical terms. (If used, give explanation in lay language)
Do not copy content of research proposal/thesis as information for participant.
The information must be consequently arranged as follows.

Title of research project: Social support and life-style modification among type 2 diabetes at Champasak hospital, LAO PDR

Principle researcher’s name Mr. Sengouthai Bounbanchop, Position Lecturer, Champasak College Health Science.

Office address Pakse District, Champasak Province, Phone: +856 31 212913

Home address Ban Phoxay, Pakse District, Champasak Province, LAO PDR

Telephone office: +856 31 212913

Telephone (home) N/A

Cell phone 020 55252545

E-mail: bcsengouthai@gmail.com

You are being invited to take part in a research project. Before you decide to participate it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and do not hesitate to ask if anything is unclear or if you would like more information

1. This research project involves
   Life-style Modification of type 2 diabetes patients

2. Objectives of the project.
   - To identify the relationship between patient’s characteristics, social support, source to information and health care provider of life-style modification among type 2 diabetes at Champasak Hospital
   - To assess life-style modification among type 2 diabetes at Champasak Hospital.
- To describe patient’s characteristics, social support, Source of DM information and health provider of life - style modification among type 2 diabetes at Champasak Hospital

3. **Details of participants.**

Population were patients who are diagnosed within the last 6 months as type 2 diabetes mellitus attended at Outpatient Department of Champasak Hospital.

4. **Characteristics, including inclusion and exclusion criteria.**

**Inclusion Criteria:**
- Type 2 diabetes who attended or live in Champasak Hospital
- Type 2 diabetes who was 35 years or older
- Type 2 diabetes who diagnosed for at least 6 months

**Exclusion Criteria:**
- Type 2 diabetes who could not communicate

**Number of participants needed.**
A total of 162 participants

5. **How to approach potential participants.**

The researcher will submit the approval letter from The permission and approval for conducting the study will be sought from Champasak Hospital. One medical doctor from Champasak Collage of Health Science will be recruited as research assistant especially on data collection. The meeting with hospital administration to plan the schedule of the interview according to hospital working time from Monday to Friday. The research has plan to interview at least 10 patients per day.

6. **Reason why this person is invited.**

- The life-style modification among type 2 diabetes at Champasak Hospital is not well practical
- The number of type 2 diabetes in Champasak Hospital is still high among 35 years or older, and these group are risk factor to the complication.

7. **Number of participants in each group**

Population are patients who are diagnosed within the last 6 months as type 2 diabetes mellitus attended at Outpatient Department of Champasak Hospital.
State that if researcher does not perform upon participants as indicated in the information, the participants can report the incident to Lao National Ethics Committee for Health & research, National institute of Public Health, Ministry of Health. Samsenthai Road, Ban Kaognot, Sisattanack district Vientiane Capital, Lao PDR Tel: +856 21 214012, 250670, Fax: +856 21 214012, Email: contact@nioph.gov.la. Website: https://www.nioph.gov.la
APPENDIX C
Informed Consent

Title: Social support and life-style modification among type 2 diabetes at Champasak hospital, LAO PDR

This study questionnaire is being done at the Thammasat University Thailand by interview. The researcher works at Champasak College of Health Science, Ministry of Health, LAO PDR. Who are studying for master degree at the Thammasat University Thailand. This study does not have any cost. So I am very pleased to invite you to take part in this study, but before you will decide to participate it is important that you have understood all detail why the research is being done.

This study has the objective to assess life-style modification among type 2 diabetes at Champasak Hospital, and describe patient’s characteristics, social support, Source of DM information and health provider of life-style modification among type 2 diabetes at Champasak Hospital. At the present time, the number of type 2 diabetes are still high in Champasak Hospital, and self-care practice is not well done, these make many complications. Which is negative impact patients, family, and socio-economic development. That is the reason and background for this study.

Please confirm with your signature that you have read and understood the following below:

- I confirm that I understand all the information for the above study.
- I understand that my participation is voluntary and I am free to withdraw at any time, without giving reason.
- I agree that my data gathered in this study may be confidential.
- I agree to take a part in the study.

Name of investigator or witness          Signature of participant
                                          (Patient)

Mr. Sengouthai Bounbanchop and assistant researcher

Date:/………/……….…
Ref. code: 25606017090108UXQ
แบบสอบทั่ว

ก่อนที่จะอธิบายอาการและเกณฑ์ในการเปลี่ยนแปลงพฤติกรรมในร่างกาย ประเภท 2, ที่เรียกว่า จ่ายยา ดังต่อไปนี้

แบบสอบทั่วถูกทำประจำเดือน VI ตามที่ มีอธิบายที่จะเป็นประโยชน์ในการเปลี่ยนพฤติกรรมในร่างกายและเกณฑ์ในร่างกายประเภท 2.

หมายเหตุ: ผู้ที่ได้รับการรักษาต่อเนื่องอาจมีการเปลี่ยนแปลงในร่างกาย

เวลา: ............................ วันเดือนปี..............

บันทึก HN: ............................................................

ช่องที่ I: บันทึกหัวข้อประกอบเรื่อง

ช่องที่, เดือน, ปี ปัจจุบันและย้อนกลับ ช่องที่ ............. เดือน ............ปี ............

เวลาสะดวกนับป่วยและทำการบันทึก ............. เดือน ............ ปี

มีอาการ ............ ถึง, ลงตัว ............ ถึง

ทดลองกระดาษแม่กระดาษด้านบน ............ mg/dl ครั้งที่ 1 วันที่ .... เดือน .... ปี ............

ทดลองกระดาษแม่กระดาษด้านบน ............ mg/dl ครั้งที่ 2 วันที่ .... เดือน .... ปี ............

ทดลองกระดาษแม่กระดาษด้านบน ............ mg/dl ครั้งที่ 3 วันที่ .... เดือน .... ปี ............

ประทับถึงเป็นประจำและต่อคง

□ เป็น

□ เป็น, ค 1. ข้อมูลประกอบโรคต่อไป: (ตอนต่อไปนี้)

□ 1. ตามที่เก็บติด  □ 2. ระยะเวลาการรักษา  □ 3. ระยะเวลาการรับยา

□ 4. ยาที่กระดาษด้านบน และ ตามต่อไป  □ 5. ยาเกี่ยวกับการดูแลต่อไป.......

2. เกิดอะไรขึ้นตามข้อต่อไปนี้... ถึง...
3. ដូច្នេះ បក្សី ប្រាក់ពីក្រុមហ៊ុនប្រការដោយក្នុងរយៈពេល  
   បន្ទាប់ ............... បក្សី ............... បន្ទាប់ ............... 
   លក់ប្រាក់ចុងក្រោយ? .......................... បន្ទាប់  
   លក់ប្រាក់ចុងក្រោយ ក្រុមហ៊ុនវេបា្  បន្ទាប់ ............... បក្សី ............... បន្ទាប់ ...............  

ផ្សេងៗទៀត: ក្រុមហ៊ុនប្រការ  

ប្រការដែលក្នុងបញ្ហាខាងលើ នឹងប្រការក្នុងការប្រការដោយក្នុងរយៈពេល 2.1  
   បន្ទាប់ បក្សី ........................../............../.............. បន្ទាប់.............. បន្ទាប់ 
2.2 អនុក្រឹត □ ឈឺ □ ឈឺ  
2.3 នេះបំផុតដើម្បី:  
   □ យកទ្រឹស្តីក្រុម  □ យកទ្រឹស្តី □ មានដូច្នេះ  
   □ យកប្រការដែល  □ អំពី (រាជធានីប្រការ)  ............................... 
2.4 អនុក្រឹត:  
   □ ចេញជាមួយ □ ជាអាចធាន □ យកទ្រឹស្តី □ យកទ្រឹស្តីនៅសម្រាប់ក្រុម 
   □ យកទ្រឹស្តី □ ត្រូវបាន □ អំពី (រាជធានីប្រការ)  ............................... 
2.5 បំផុតប្រការដែល (នៅបន្ទាប់) ................................. បន្ទាប់/បន្ទាប់  
   □ 1,000,000 បន្ទាប់/បន្ទាប់  □ 1,000,000 – 2,500,000 បន្ទាប់/ 
   បន្ទាប់  
   □ 2,500,000-5,000,000 បន្ទាប់/បន្ទាប់  □ 5,000,000-10,000,000 បន្ទាប់/បន្ទាប់ 
2.6 ក្រុមហ៊ុនប្រការនៅសម្រាប់ក្រុមហ៊ុន?  
   □ បាន  
   □ បាន  ក្រុមហ៊ុនប្រការដែល?  
   □ យកទ្រឹស្តីក្រុមប្រការ  □ យកទ្រឹស្តីក្រុមអន្តរជាតិ  
   □ យកទ្រឹស្តីក្រុមប្រការដែល  □ អំពី (រាជធានីប្រការ)  ............................... 
2.7 ដំឡើងមកដល់ក្រុមហ៊ុន?  .................. បន្ទាប់ ............... បន្ទាប់  

Ref. code: 25606017990108UXQ
ส่วนที่ III: กระบวนการแบบพาณิชย์ในการจัดการ

3.1 ให้เอกสารมีรายการเป็นประจำ (เอกสารมีรายการ 30 รายการ)

๑ ยังไม่เคย  ๒ บางส่วน  ๓ บางส่วนเป็นประจํา  ๔ เป็นประจํา

๑ี่ (การสนับสนุนเจ้าหน้าที่) 

3.2 เอกสารมีรายการแบบใด?

๑ เอกสารมีรายการถ้ายัง  ๒ ยังไม่  ๓ แล้ว

3.3 เจ้าสุรัยบุ๊?

๑ ยังสูง  ๒ ต่ำสุดแล้ว  ๓ สูงสุดไปถึงปริมาณแล้ว? ......ปี ...... เติม

๓ สูง  ๑ ที่บานให้เจ้าหน้าเจ้าหน้าที่สูงสุดสามารถขาย ยะอย่างไร?

๑ น้อยลง  ๒ ปริมาณมาก  ๓ ปริมาณ

๑ ปริมาณน้อยไปใน ๖ เดือน  ๑ น้อยลง

๑ ปริมาณ  ๒ ปริมาณมาก  ๓ ปริมาณ

3.4 เจ้าที่มีข้อบกพร่อง?

๑ ยังไม่เคย

๒ เทียบเท่า  ๒ เทียบเท่าบ้างแล้ว? ..........เดือน .......... ปี

๓ น้อย  ๑ ที่บานให้เจ้าหน้าเจ้าหน้าที่สูงสุดขาย ยะอย่างไร?

๑ ไม่ขยับ  ๒ ปริมาณถูก  ๓ ปริมาณ

๑ ปริมาณของเจ้าหน้าใน ๖ เดือนที่ผ่านมา.

๑ ปริมาณ  ๒ ปริมาณมาก  ๓ ปริมาณ

3.5 เจ้าที่มีข้อบกพร่อง ลำดับถูก  บกพร่อง?

๑ ยังไม่เคย

๒ เทียบ  ๑ เทียบ  เทียบอ่อนนุ่มหลายลำดับเทียบ ทำให้เกิดไม่สมบูรณ์?

๑ ยังไม่เคย  ๒ เทียบ  ๓ อ่อนนุ่มที่ ๔ อ่อนนุ่มที่

3.6 กิจกรรมที่เปลี่ยน?

๑ ยังไม่เคย  ๒ เทียบ  ๓ เทียบ  ๔ที่ยังไม่เคย

3.7 กิจกรรมที่เปลี่ยนมีข้อบกพร่อง?

๑ ยังไม่เคย  ๒ เทียบ  ๓ เทียบ  ๔ เทียบ  ๕ เทียบ  ๖ เทียบ
3.8 ក្រុមតាមស្បែកមួយមិនមានទេទេ?  
 1 ប្រការ 2 រឿងហេតុ 3 ក្រុមហេតុ 4 ក្រុមបែបទទេ  
3.9 ក្រុមតាមទូរស័ព្ទទេ?  
 1 ប្រការ 2 រឿងហេតុ 3 ក្រុមហេតុ 4 ក្រុមបែបទទេ  
3.10 ក្រុមអូតនាគោ  
 1 ប្រការ 2 រឿងហេតុ 3 ក្រុមហេតុ 4 ក្រុមបែបទទេ  
3.11 ក្រុមបែប?  
 1 ប្រការ 2 រឿងហេតុ 3 ក្រុមហេតុ 4 ក្រុមបែបទទេ  
3.12 ក្រុមអូតនាគោ?  
 1 ប្រការ 2 រឿងហេតុ 3 ក្រុមហេតុ 4 ក្រុមបែបទទេ  
3.13 តាមមូលដ្ឋានទៅកាន់សមាប័ត្រ, សារព័ន្ធផ្សេងទៀត?  
 1 ប្រការ 2 រឿងហេតុ 3 ក្រុមហេតុ 4 ក្រុមបែបទទេ  
3.14 នៅទីតាំងមួយៗតាមមូលដ្ឋាន?  
 1 ប្រការ 2 រឿងហេតុ 3 ក្រុមហេតុ 4 ក្រុមបែបទទេ  
3.15 មិនប្រការប្រការ?  
 1 មិន 2 ដែល  
3.16 តាមមូលដ្ឋានដែលសម័យរបស់?  
 1 ប្រការ 2 រឿងហេតុ 3 ក្រុមហេតុ 4 ក្រុមបែបទទេ  
3.17 ក្រុមអនាខ្លាំងក្រុមដន្លៃណាមួយ?  
 1 មិន 2 ដែល  
3.18 ក្រុមអនាខ្លាមួយជ័យជ័យដល់?  
 1 នៅពេល 2 ដែល  
3.19 ក្រុមអនាខ្លាមួយដេសដី?  
 1 ត្រូវការនឹង 2 ដែល  
3.20 ក្រុមអនាខ្លាមួយដេសដី?  
 1 នៅពេល 2 ដែល  
 3) បែកបូរ 4) ក្រុមអនាខ្លាមួយដេសដី?  
 1 ប្រការ 2 រឿងហេតុ 3 ក្រុមហេតុ 4 ក្រុមបែបទទេ  
3.21 ដើម្បីមិនដេសដីមួយៗអនាខ្លាមួយដេសដី?  
 1 នៅពេល 2 ដែល  
 3) បែកបូរ 4) ក្រុមអនាខ្លាមួយដេសដី?  
 1 ប្រការ 2 រឿងហេតុ 3 ក្រុមហេតុ 4 ក្រុមបែបទទេ  
 1 បែកបូរ (តាមរយៈកុមារ) .................................
3.22 តាមលិខុំប្រការី ៖ កុំព្យូទ័នទៅ ៣ ពេល។
  ១. មិន មានការធ្វើឡើងវិញ?
  ២. មានការធ្វើឡើងវិញ ពេលទី ១ ទៅ ៣ ពេល

3.23 បញ្ចូលទិន្នន័យខាងមុខសន្តិភាពសម្រាប់ ៤ ក្នុងពេល ៣ ខែ:
  ១. ប្រការី និង ការធ្វើអំពីអំពីប្រទេស ០ ខែ
  ២. ប្រការី និង ការធ្វើអំពីអំពីប្រទេស ១ ខែ
  ៣. ប្រការី និង ការធ្វើអំពីអំពីប្រទេស ٢ ខែ
  ៤. ប្រការី និង ការធ្វើអំពីអំពីប្រទេស ៣ ខែ

3.24 តាមលិខុំប្រការី ៖ កុំព្យូទ័នទៅ ៣ ខែ?
  ១. មិន មានការធ្វើឡើងវិញ ០ ខែ
  ២. មានការធ្វើឡើងវិញ ១ ខែ
  ៣. មានការធ្វើឡើងវិញ ២ ខែ
  ៤. មានការធ្វើឡើងវិញ ៣ ខែ

ចំណង ៤: ការសិក្សារបស់សិស្ស

ក្នុងពេលប្រការី ៖ តាមលិខុំប្រការី

4.1 ការសិក្សារបស់សិស្ស

  ១. ប្រការីនិងការធ្វើអំពីអំពីប្រទេសក្នុងពេល
  ២. ប្រការីនិងការធ្វើអំពីអំពីប្រទេសក្នុងពេល
  ៣. ប្រការីនិងការធ្វើអំពីអំពីប្រទេសក្នុងពេល
  ៤. ប្រការីនិងការសិក្សារបស់សិស្សរបស់សិស្សក្នុងពេល
  ៥. ប្រការីនិងការសិក្សារបស់សិស្សក្នុងពេល
  ៦. ប្រការីនិងការធ្វើអំពីអំពីប្រទេស

Ref. code: 25606017090108UXQ
7. កុំឱ្យយើងចាត់បែងឈ្មោះ ហើយ ឱ្យការអនុម័តឈ្មោះ ដោយរយៈពេលពេលបំផុតបំផុត?  
  □ ២ បំផុត  □ ៣ បំផុត  □ លោកខ្លី  

4.2 ការមើលបញ្ហាបញ្ហាសម្រាប់ប្រាក់បរិស័ររបស់ខ្លួន:  

8. កុំឱ្យយើងកុំឱ្យប្រើប្រាស់ ហើយ កុំឱ្យប្រើប្រាស់ប្រាក់បរិស័រ?  
  □ ២ បំផុត  □ ៣ លោកខ្លី  □ លោកកប់  

9. កុំឱ្យយើងកុំឱ្យការពេញប្រាក់ ហើយ ប្រើប្រាស់វិញ ដោយរយៈពេលពេលបំផុតបំផុត?  
  □ ២ បំផុត  □ ៣ លោកខ្លី  □ លោកកប់  

10. កុំឱ្យយើងត្រូវបានកុំឱ្យប្រើប្រាស់ ប្រាក់បរិស័រដោយរយៈពេលពេលបំផុតបំផុត?  
  □ ២ បំផុត  □ ៣ លោកខ្លី  □ លោកកប់  

11. កុំឱ្យយើងកុំឱ្យការសម្រាប់បញ្ហារវិទេ កុំឱ្យយើងកុំឱ្យប្រើប្រាស់ និង កុំឱ្យយើងកុំឱ្យប្រាក់បរិស័រដោយរយៈពេលពេលបំផុត?  
  □ ២ បំផុត  □ ៣ លោកខ្លី  □ លោកកប់  

12. កុំឱ្យយើងកុំឱ្យការសម្រាប់បញ្ហារវិទេ ប្រាក់បរិស័រប្រាក់បរិស័រ?  
  □ ២ បំផុត  □ ៣ លោកខ្លី  □ លោកកប់  

13. កុំឱ្យយើងកុំឱ្យលេងប្រាក់បរិស័រ និង ការសម្រាប់បញ្ហារវិទេប្រាក់បរិស័រ?  
  □ ២ បំផុត  □ ៣ លោកខ្លី  □ លោកកប់  

14. កុំឱ្យយើងប្រការី ហើយ កុំឱ្យការសម្រាប់បញ្ហារវិទេ ដោយរយៈពេលពេលបំផុតបំផុត?  
  □ ២ បំផុត  □ ៣ លោកខ្លី  □ លោកកប់  

ចំណាត់ថ្នាក់ V: សម្រាប់ប្រការីការពេញការប្រការីការប្រការី  

5.1 កុំឱ្យយើងទទួលបានផ្លូវតែនៅក្នុងការប្រការីការប្រការី?  
  □ ២ បំផុត  
  □ ៣ លោកខ្លី  វិញ កុំឱ្យយើងទទួលបានផ្លូវតែនៅក្នុងការប្រការី? (រុក។)  
  □ ២ បំផុត  □ ២ លោកខ្លី,ជម្រើស  □ ២ ត្រូវ ដោយអ្នកសម្រាប់ស្រាយការប្រការី  

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5.2 ការបង្កើតការទទួលបានទូទៅអំពីតុលាការបន្តិច? (បញ្ជាក់លើការដែល)

   ១ ការបញ្ជាក់ទំនើប  ២ ការបញ្ជាក់ទំនើប  ៣ ការបញ្ជាក់ទំនើប  ៤ ការសម្រួល  ៥ ការសម្រួល  ៦ ការសម្រួល  (ការបញ្ជាក់ទំនើប)  

5.3 គឺ និង មានប្រភេទ ដែលនឹងមានបញ្ហានេះត្រូវបាន?  

   ១ បញ្ជាក់  ២ បញ្ជាក់ 

5.4 គឺ និង មានប្រភេទដែលមានបញ្ហានេះ និង មានប្រភេទដែលត្រូវឈរបញ្ហា?  

   ១ បញ្ជាក់  ២ បញ្ជាក់ 

5.5 ការបង្កើតការទទួលបានទូទៅអំពីតុលាការបន្តិច?  

   ១ បញ្ជាក់ 

   ២ បញ្ជាក់  ៣ ការបង្កើតការទទួលបាន?  (បញ្ជាក់លើការដែល)  

   ១ ការបញ្ជាក់  ២ ការបញ្ជាក់  ៣ ការបញ្ជាក់  

5.6 ការបញ្ជាក់ទទួលបានអំពីភាពរបស់វីដេអូ, វីដេអូ និង វីដេអូ?  

   ១ បញ្ជាក់  ២ បញ្ជាក់ 

5.7 ការបង្កើតការទទួលបានអំពីអត្ថប្រយោជន៍ តាមប្រភេទមួយប្រភេទ?  

   ១ បញ្ជាក់  

   ២ បញ្ជាក់  ៣ ការបង្កើតការទទួលបាន?
6.1 ការសុំសាស្ត្រក្នុងការសុំសាស្ត្រនូវការសុំសាស្ត្ររបស់អ្នកខាងលើនិងរបស់អ្នកបរិច្ឆេត

6.1 ការសុំសាស្ត្រក្នុងការសុំសាស្ត្ររបស់អ្នកខាងលើនិងរបស់អ្នកបរិច្ឆេត

6.2 ការសុំសាស្ត្រក្នុងការសុំសាស្ត្ររបស់អ្នកខាងលើនិងរបស់អ្នកបរិច្ឆេត

6.3 ការសុំសាស្ត្រក្នុងការសុំសាស្ត្ររបស់អ្នកខាងលើនិងរបស់អ្នកបរិច្ឆេត

6.4 ការសុំសាស្ត្រក្នុងការសុំសាស្ត្ររបស់អ្នកខាងលើនិងរបស់អ្នកបរិច្ឆេត

6.5 ការសុំសាស្ត្រក្នុងការសុំសាស្ត្ររបស់អ្នកខាងលើនិងរបស់អ្នកបរិច្ឆេត

6.6 ការសុំសាស្ត្រក្នុងការសុំសាស្ត្ររបស់អ្នកខាងលើនិងរបស់អ្នកបរិច្ឆេត

6.7 ការសុំសាស្ត្រក្នុងការសុំសាស្ត្ររបស់អ្នកខាងលើនិងរបស់អ្នកបរិច្ឆេត

6.8 ការសុំសាស្ត្រក្នុងការសុំសាស្ត្ររបស់អ្នកខាងលើនិងរបស់អ្នកបរិច្ឆេត

6.9 ការសុំសាស្ត្រក្នុងការសុំសាស្ត្ររបស់អ្នកខាងលើនិងរបស់អ្នកបរិច្ឆេត

6.10 ការសុំសាស្ត្រក្នុងការសុំសាស្ត្ររបស់អ្នកខាងលើនិងរបស់អ្នកបរិច្ឆេត

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ក្រុមបរិសុំតុលាការ និង ក្រុមគុណភាពរបស់តុលាការ

អតិថិជនតុលាការ: 
ប្រកួតបរិសុំពីព្រំដេញមេឃ និងតំបន់ប្រជាពលរដ្ឋ ក្រុមគុណភាពរបស់តុលាការ និង តំបន់ប្រជាពលរដ្ឋ មិនអាចប្រកួតបរិសុំបាន។

ធ្វើប្រាក់បរិសុំ: 
ការស្រង់បរិសុំអំពីការសិក្សាទាំងអស់ និងការប្រាក់បរិសុំដោយមិនគិតមុន ប្រុងស្រីខ្លះ។

ខ្លួនឯងត្រូវបានបញ្ចប់ការសិក្សាស能ីវិទ្យាយាយក្នុងប្រជាជនដែលមានអតិថិជនតុលាការ និង ក្រុមគុណភាពរបស់តុលាការ

1. ការសិក្សានេះត្រូវបានបង្កើតដោយប្រុងស្រីក្នុងប្រជាជនដែលមានអតិថិជនតុលាការ និង ក្រុមគុណភាពរបស់តុលាការ 

Ref. code: 25606017090108UXQ
2. ຈໍາປະກວດ.
    ທ່ານປະຊາກອນກັບລາວຈະເປັນເບົາຫວານປະເພດ 2, ຜູ້ທີ່ໃຊ້ຈັດການຜ່າໄດ້ນບ່ອນຄັ້ງ 6 ກ່ຽວກັບລາວຈະເປັນເບົາຫວານປະເພດ 2, ຜູ້ທີ່ໃຊ້ຈັດການຜ່າໄດ້ນບ່ອນຄັ້ງ 6 ກ່ຽວ.
    ທ່ານປະຊາກອນກັບລາວຈະເປັນເບົາຫວານປະເພດ 2, ຜູ້ທີ່ໃຊ້ຈັດການຜ່າໄດ້ນບ່ອນຄັ້ງ 6 ກ່ຽວ.

3. ປະຫຼວດ.
   ຄວນນະໂຍມອາຍການບັນຫາຜູ້ເປັນເບົາຫວານປະເພດ 2 ໃນຄວນແຍກການພັງປັງແຮງຮຽນປະເພດ 2, ຜູ້ທີ່ໃຊ້ຈັດການຜ່າໄດ້ນບ່ອນຄັ້ງ 6 ກ່ຽວ.

4. ທ່ານປະຊາກອນທີ່ສັງຄົມຈະສັງຄົມໃນຕົວລອງ
   • ທ່ານເປັນໂທລະສັບຄ່າ:
     ທ່ານເປັນໂທລະສັບຄ່າ 2 ໃນຄວນແຍກການພັງປັງແຮງຮຽນມາ 30 ກ່ຽວ, ທ່ານເປັນໂທລະສັບຄ່າ 2 ໃນຄວນແຍກການພັງປັງແຮງຮຽນມາ 6 ກ່ຽວ, ທ່ານເປັນໂທລະສັບຄ່າ, ທ່ານເປັນໂທລະສັບຄ່າ 2 ໃນຄວນແຍກການພັງປັງແຮງຮຽນມາ 7 ກ່ຽວ.
   • ທ່ານເປັນໂທລະສັບຄ່າ
     ທ່ານເປັນໂທລະສັບຄ່າ 2 ໃນຄວນແຍກການພັງປັງແຮງຮຽນມາ 7 ກ່ຽວ.

5. ກຸ່ມມືນຊົ່ວມຂອງ.
   ທ່ານທີ່ເຂັ່ມມືນຊົ່ວມຂອງມາбин 162 ທ່ານ (ລວມທັງ 10% ທ່ານຂຽນສະຫະນະມາбинມືນຊົ່ວມຂອງ)

6. ທ່ານມາбинຜູ້ທິບມາбинຄັບຄວນ
   ທ່ານທິບມາбинຜູ້ທິບມາбинຄັບຄວນ ແລະ ທ່ານເປັນໂທລະສັບຄ່າ 2 ໃນຄວນແຍກການພັງປັງແຮງຮຽນມາ 7 ກ່ຽວ.

7. ທ່ານເປັນໂທລະສັບຄ່າ 2 ໃນຄວນແຍກການພັງປັງແຮງຮຽນມາ 7 ກ່ຽວ.
ນີ້ແມ່ນສາເຫດເຮັດໃຫ້ເສຍຊິວິດ, ຊັບສິນຂອງຄອບຄົວ ແລະ ບັນຫາອໃນຄອງທີ່ຕິດພັນກັບການສູນເສຍທາງລົບ.

- ກໍ່ຕ້ອງການຂອງຈັດການສູນເສຍຊິວິດ ແລະ ບັນຫາອໃນຄອງທີ່ຕິດພັນກັບການສູນເສຍທາງລົບ. 
- ສິ່ງທີ່ສຸງຄົນ ແລະ ເຫັນວ່າຈ້າຍເປັນທີ່ຈະຕ້ອງສຶກສາສາຍພວພັນລະຫວ່າງແບບແຜນຄູລົງຊິວິດ ແລະ ປາກເບົາຫວານຂອງຜູ້ປະບົດ ທີ່ເຮັດໃຫ້ປາດສະຈາກພະຍາດທີ່ແຊກຊ້ອນແລະມິມມາໃນການສຶກສາຄັ້ງນີ້.

**ປະຈ໌ບັນ**

ໃນປີ 2012, ເບົາຫວານມິວ 1,247 ຄົນ, ແລະ ເສຍຊິວິດ 3 ຄົນ. ເບົາຫວານມິວ 339 ຄົນ, ເສຍຊິວິດ 0 ຄົນ. ເບົາຫວານ 569 ຄົນ, ແລະ ເສຍຊິວິດ 0 ຄົນ. ເບົາຫວານ 692 ຄົນ, ເສຍຊິວິດ 0 ຄົນ, ເບົາຫວານ 706 ຄົນ, ເສຍຊິວິດ 0 ຄົນ, ເບົາຫວານ 872 ຄົນ, ເສຍຊິວິດ 0 ຄົນ.

**ປະຈ໌ບັນ**

ການສຶກສາຈາກຊິວິດໃນບັນຫາອໃນຄອງທີ່ຕິດພັນກັບການສູນເສຍທາງລົບ.

**ປະຈ໌ບັນ**

ການສຶກສາຈາກຊິວິດໃນບັນຫາອເບົາຫວານຂອງຜູ້ປະບົດ ທີ່ຈະຕ້ອງສຶກສາສາຍພວພັນລະຫວ່າງແບບແຜນຄູລົງຊິວິດ ແລະ ປາກເບົາຫວານຂອງຜູ້ປະບົດ ທີ່ເຮັດໃຫ້ປາດສະຈາກພະຍາດທີ່ແຊກຊ້ອນ.

**ພ້ອມນະຄອນຫວຽດນາມ**

ການສຶກສາຈາກຊິວິດຂອງຜູ້ປະບົດ ທີ່ຈະຕ້ອງສຶກສາສາຍພວພັນລະຫວ່າງແບບແຜນຄູລົງຊິວິດ ແລະ ປາກເບົາຫວານຂອງຜູ້ປະບົດ ທີ່ເຮັດໃຫ້ປາດສະຈາກພະຍາດທີ່ແຊກຊ້ອນ.

**ພ້ອມນະຄອນຫວຽດນາມ**

ການສຶກສາຈາກຊິວິດຂອງຜູ້ປະບົດ ທີ່ຈະຕ້ອງສຶກສາສາຍພວພັນລະຫວ່າງແບບແຜນຄູລົງຊິວິດ ແລະ ປາກເບົາຫວານຂອງຜູ້ປະບົດ ທີ່ເຮັດໃຫ້ປາດສະຈາກພະຍາດທີ່ແຊກຊ້ອນ.

**ຄວ້າມາຂອງນັກຂ້າມ**

ການສຶກສາຈາກຊິວິດຂອງຜູ້ປະບົດ ທີ່ຈະຕ້ອງສຶກສາສາຍພວພັນລະຫວ່າງແບບແຜນຄູລົງຊິວິດ ແລະ ປາກເບົາຫວານຂອງຜູ້ປະບົດ ທີ່ເຮັດໃຫ້ປາດສະຈາກພະຍາດທີ່ແຊກຊ້ອນ.

**ໂທລະທານ**

+856 21 214012, 250670; Email: contact@nioph.gov.la; ເວບໄຊ: https://www.nioph.gov.la

Ref. code: 25606017090108UXQ
ໃບຍິນຍອມເຂົ້າຮ່ວມການສຶກສາ

ທັດເດດການສຶກສາ: ການສະໜັບສະໜູນຂອງອອງທັງໝູດ และ ການປັບປ່ອນແບບເຄີຍຕິດ ແອງກັບ ການເຮັດການປະກມນ 2, ມີຄວາມຈັດການ.

ການສຶກສາຢູ່ການປະກມນ ຆູໄ້ແບບໃນການສຶກສາ ແລະ ສະໜັບສະໜູນຂອງສັງຄົມ, ຂໍາລູວຜິດຊາຍໃນການປະກມນ ຈັດການເຮັດການປະກມນຢູ່ການສຶກສາທີ່ 2, ສະນັ້ນ, ການປະກມນໃຫ້ດຽວກັນ ຄູກຂໍ້ມູນ, ການເຂົ້າຮ່ວມຊົນສັດສັງຂອງຜູ້ບໍລິການ ແລະ ການສຶກສາກັບຄົນເຈັບເບົາຫວານປະເພດ 2, ປະເທດໄທ.

1. ການສຶກສາໃນຄັ້ງນັ້ນ ຄວາມສຶກສາ ແລະ ການສະໜັບສະໜູນຂອງສັງຄົມ ຂໍາລູວຜິດຊາຍໃນການປະກມນ ຈັດການເຮັດການປະກມນຢູ່ການສຶກສາທີ່ 2, ປະເທດໄທ.

ທັດເດດການສຶກສາໃນຄັ້ງນັ້ນ:

- ການສຶກສາໃນຄັ້ງນັ້ນ ຄວາມສຶກສາ ແລະ ການສະໜັບສະໜູນຂອງສັງຄົມ ຂໍາລູວຜິດຊາຍໃນການປະກມນ ຈັດການເຮັດການປະກມນຢູ່ການສຶກສາທີ່ 2, ປະເທດໄທ.

- ການສຶກສາໃນຄັ້ງນັ້ນ ຄວາມສຶກສາ ແລະ ການສະໜັບສະໜູນຂອງສັງຄົມ ຂໍາລູວຜິດຊາຍໃນການປະກມນ ຈັດການເຮັດການປະກມນຢູ່ການສຶກສາທີ່ 2, ປະເທດໄທ.

Ref. code: 25606017090108UXQ
ឈ្មោះជាការីមើល និង ដាក់ឈ្មោះ កុមារដែលមនុស្សព្រមកំពូល​ប្រែចុះប្រការ។

ការដាក់ឈ្មោះអតិបត្រប្រការរដឹមប្រការ

(នាយ្តិកា)

លំនៅដើមប្រការរដឹមប្រការ

អាហារនៃមនុស្សស្គាល់កុមារនិងប្រការរដឹមប្រការ

ប្រការ

ខ្លឹប:................./.........../.........
APPENDIX D

Ethical consideration

Ministry of Health
National Ethics Committee
for Health Research (NECHR)

Approval Notice

Mr. Sengouthai BOUNBANCHOP
Email: bcsengouthai@gmail.com
Tel: +856 20 55252545

RE: Ethical Approval for Health Research

Title: "Social Support and Life-style Modification among type 2 Diabetes at Champassak Hospital, Lao PDR"

Dear Mr. Sengouthai BOUNBANCHOP,

The National Ethics Committee for Health Research of the Lao People’s Democratic Republic have reviewed and approved your research.

Please note the following information about your approved research protocol:

Approval period: March 2018 – March 2019
Approved Subject Enrollment: The patients who are diagnosed within the last 6 months as type 2 diabetes mellitus attended at Outpatient Department of Champassak Hospital
Sponsor: ADB
Implementing Panel/Project Investigator: Mr. Sengouthai BOUNBANCHOP

Please note that the Ethics Committee reserves the right to ask for further questions, seek additional or monitor the conduct of your research and consent process.

Principle Investigator is required to notify the Secretary of the National Ethic Committee for Health Research:

- Any significant change to the project and the reason for that change, including an indication of ethical implications (if any);
- Serious adverse effects on participants and the action taken to address those effects;
- Any other unforeseen events or unexpected developments that merit notification;
- The inability of the Principal Investigator to continue in that role, or any other change in research personnel involved in the project;
- Any expiry of the insurance coverage provided with respect to sponsored clinical trials and proof of re-insurance;
- A delay of more than 12 months in the commencement of the project; and,
- Termination or closure of the project.

Additionally, the Principal Investigator is required to submit a progress report on the anniversary of approval and on completion of the project.

President of National Ethics Committee for Health Research

[Signature]

Prof. Dr. Douangdao SOUKALOUN

Ref. code: 25606017090108UXQ
BIOGRAPHY

First and last name          Mr. Sengouthai Bounbanchop  
Date of Birth               July 02, 1982
Education Attainment        In 2013. Bachelor degree of Nursing, Faculty of nursing, University of Health Sciences, Lao PDR,
Work Position               Lecturer, Champasak College of Health Sciences
Scholarship                 In 2017, Asian Development Bank
Work Experiences            2003 to present, lecturer, Champasak College of Health Sciences