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# HEALTH LITERACY AND HEALTH BEHAVIOR AMONG TYPE 2 DIABETIC PATIENTS: A QUALITATIVE STUDY

KANTAPONG PRABSANGOB

College of Allied Health Science, Suan Sunandha Rajabhat University, Thailand  
E-mail: kantapong.pr@sru.ac.th

**Abstract:** Health literacy is important for self-care management of diabetic patients and has an impact on health outcome. This study aimed to describe the perception and experiences of concerned people and diabetic patients toward health literacy and health behavior among type 2 diabetic patients.

**Method:** Qualitative method was employed by using in-depth interview. Twenty six key informants including: two health literacy experts, two health behavior experts, six health providers [two physicians, two nurse, and two public health worker], eight diabetic patients, and eight diabetic caregiver. Data were analyzed by using content analysis.

**Results:** The findings revealed that health literacy experts and health behavior experts agreed that health literacy have significant effects to diabetic self-care behavior, especially in low educated patients. Health providers and diabetic patients faced with the communication gap because they had time limitation for providing the services and health related information and the patients are low education and old age. Consequently, the patients have inadequate knowledge of disease and care. The diabetic patients and their care givers reported that time spend with their physicians was too short. Even though the patients know that the sweet are risk for diabetes, it was hardly to control their food consumption due to they must ate the same food as the others particularly when they had joined the various social events in the communities. Some of diabetic patients had to drink high sugar energy drink for increasing their energy to work in the orchard. Health literacy is critical to empowerment by improving people's access to health information and their capacity to use it effectively. Improving health literacy of diabetic patients, the collaboration among various units at the health facility is necessity.

**Keyword:** Health Literacy, Health Behavior, Type 2 diabetes

## I. INTRODUCTION

Diabetes mellitus or diabetes is one of chronic diseases and causes death to numbers of patients around the world. In 2013, an approximately 382 million people are estimated to have diabetes and 316 million people are living with impaired glucose tolerance [1]. The number of people with diabetes is increasing in every country. For Thailand, according to Ministry of Public Health (Thailand), Chronic Disease Surveillance Report of 2010, there were 888,580 diabetic patients in Thailand. The ratio of diabetic illness from the report was 1,395 patients per 100,000 populations. This made it ranked as the second top of non-communicable diseases, of which the first top belonged to high blood pressure. Diabetes is due to abnormal insulin production or the effect of insulin that has an impact on high blood sugar or glucose level. According to pathology, diabetes can be classified into four types; type I, type II, gestational diabetes (found during pregnancy), and other types [2]. Type II diabetes mellitus is caused by the combination of abnormal insulin secretion of beta cells and the effect of insulin resistance. A person with diabetes may have either result from those mentioned causes greater than one another. Despite diabetes is a chronic disease, it is treatable through dietary control, physical exercises, and oral medicine. The patients who have long term diabetes, their beta cells may gradually be destructed and fail to control the blood sugar or glucose level. Insulin medication, such as insulin injection, is needed to

help control the glucose level instead of the cells' production itself. Type II diabetes is mostly found in people aged over 40 years. Risk factors of this type are older age, overweight, lack of physical exercises, and genetics. The patients with long term diabetes and poor blood sugar control will easily develop complications that cause illness and death. Complications in diabetic patients may be found when the persons are first diagnosed of diabetes. Those people may have diabetes without any symptoms. The goal of treatment in diabetes is to control blood sugar to normal or close to normal level as much as possible. So fasting blood glucose level after 8-12 hours must be 90-130 mg/dl, or the level of hemoglobin A1c (HbA<sub>1c</sub>) is less than 7% [2]. Diabetes is a chronic disease. The patients must see their doctors regularly for health checkup, picking up some medicine, and taking doctors' advice. While examining, the patients must inform symptoms and health problems related to their diabetic illness. The doctor will provide recommendation of how to take better care of themselves, and how to control blood sugar to normal level; prescribe medicine; and explain how to take medicine correctly. In order to make patients understand and follow doctors' advice correctly, communication between patients and doctors must be effective. The important components to improve mutual and better understanding are language usage in communication and point of views on the topic discussing. Both patients and doctors must understand what the other try to communicate and what the other perceive on the subject they are

discussing. When the patients do not understand health information or have low health literacy, they will not follow doctors' direction. Low health literacy and abandoning doctors' advice or direction are obstacles prevent them from good health.

Health Literacy or skills in health was first recognized in the United States of America where people from different ethnicities with different languages and cultures live together. Some patients have problem with using English as a second language to communicate with health providers. They seldom understand health information or how to take better health care. According to the study in the patients with diabetes, the patients with low health literacy were likely to have care less in their health. They had high blood sugar level, were often admitted in a hospital, and had more complications in diabetes ([3]; [4]; [5]; [6]). It was costly to diabetic treatment. Health literacy; therefore, drew more interesting in the United States. In 1998, World Health Organization defined health literacy as "cognitive and social skills that determine an individual's motivation and ability to access, understand, and use the health information to promote and always maintain good health for oneself. Later on Health organizations and researchers defined health literacy as can be summarized as the ability of a person to obtain health information from different media channels, and to understand and recognize the obtained health information until utilizing the information as to promote and always maintain one's good health.

Passche-Orlow and Wolf [7] proposed the model that explained a relationship between limited health literacy and health outcome. The study unveiled a potential factor of limited health literacy included socioeconomic and social supports, culture, language, race/ethnicity, education, age, individual capacity and physical condition. Limited health literacy was found related with lower health condition. This was due to the reason that persons with limited health literacy could not understand the details or the information given by hospital staff. Difficulties in communication and interaction with doctor also occur. They do not know how to take care of themselves correctly at home. These cause worse health condition.

Schillinger et al. [5] found that inadequate health literacy in type-2 diabetic patients correlated with failure in controlling blood glucose level. This was due to the fact that diabetic patients with lower health literacy often faced with a difficulty in reading drug labels, or in understanding blood glucose test result, doctor's prescriptions or other details received from hospitals. Even though how much effect of low health literacy is on diabetic treatment cannot be precise, several research papers have at a certain length proved that low health literacy has an effect on controlling blood glucose level. Patients with low health literacy do often not know or remember the name of drugs and how to use [8] and do not know

their health condition and how to deal with it ([9]; [6]). Furthermore, there are several studies found that patients with low health literacy do not quite express their opinions on self-healthcare, and usually depend on people in families, friends and hospital staff in making decision ([10]; [11]; [12]). In the worse case, patients with low health literacy were found to have a problem in memorizing and understanding medical information. This should be greatly concerned by healthcare service providers, as these patients cannot know how to gather or search for more information as they still do not understand or cannot remember the details received from hospitals, due to ineffective communication [6]. Schillinger et al. [5] found that when comparing a communication level between doctors and 2 types of patients: patients with adequate health literacy and patients with low health literacy, doctors did not usually explain about health condition and steps in treating to low health literacy group. Therefore, doctors, nurses and other healthcare service providers should try to adjust the ways of communication which facilitate an effectiveness and appropriateness to this type of patients so that the patients will be able to understand the messages and they can be persuaded to change to more appropriate behavior. Although some studies found that there was no correlation between health literacy and self-care behavior of diabetic patients [13], healthcare service providers should aware of how much their patients are ready to receive suggestions and willing to adjust their behavior.

## II. METHODS

In the study, a qualitative research was used. The researcher focused to study the situation on health literacy and health behavior of diabetic patients aged between 40-80 years, visiting sub-district health promotion hospitals in Samut Songkram province for their diabetic treatment. The qualitative research method was employed; observation and in-depth interviews were used to collect data about the situation on health literacy and health behavior of diabetic patients. During the interview, there was tape record. The researcher observed and recorded obtained information from the interview. In addition, an anthropological expert, who was as an advisor making some recommendations, closely advised during an in-depth interview data collection process in order to receive appropriate and accurate information. Data was collected and analyzed by using content analysis to describe the belief and perception of diabetes.

## III. RESULTS

### The result of the characteristics of the diabetic patients

The majority of the diabetic patients were female, aged 45-79 years old. Most participants were

Diagnosed with DM more than one year (ranged 1- 20 years) prior to interviewing. Most of them were not able to control their blood sugar (HbA1c > 7.0) as shown in Table 1.

**Table 1:**  
**The demographic information of 8 diabetic patients**

No.	Sex	Age (years)	DM duration	BMI	HbA1c (DTN)
1	M	59	7	39	8.4
2	F	45	2	25	6.2
3	F	50	7	21	8.3
4	M	79	20	18	9.2
5	M	48	3	26	6.7
6	F	65	10	30	7.6
7	F	69	8	20	7.3
8	M	72	2	27	8.5

**The result of observation and content analysis**

Health literacy experts and health behavior experts agreed that health literacy have significant effects to diabetic self-care behavior, especially in low educated patients. The academic experts reported that most of the DM patients are low education and old age. Therefore, health providers and diabetic patients faced with the communication gap, for example:

*"Although some diabetic patients don't understand what a health provider talking about, they don't ask any question."* (Expert B)

Health providers and diabetic patients faced with the communication gap because they had time limitation for providing the services and health related information and the patients are low education and old age. Consequently, the patients have inadequate knowledge of disease and care, for example:

*"We have only 2-3 minutes for each patient because so many patients waiting to see us."* (Nurse J)

*"Don't worry. Even though I love to eat the sweet, my blood sugar will not be high because I take the medicine after eating it."* (Patient N)

A doctor reported that the diabetic patients have inadequate knowledge of the diabetes disease and care, ignorance to control blood sugar, non-compliance on taking medicines and unhealthy eating habits and so on, for example:

*"I often ask my diabetic patients whether they have any question about what I have told them. Most of them said No! However, they still do what I told them don't do."* (Doctor Ch)

*"My uncle has diabetes but he love to eat sweet rice with mango. He said without it he gonna die."* (Caregiver S)

The diabetic patients and their care givers reported that time spend with their physicians was too short, for example:

*"I spent 3 hrs. waiting to see my doctor but I had less than 3 munities to see him."* (Patient W)

Even though the patients know that the sweet are risk for diabetes, it was hardly to control their food consumption due to they must ate the same food as the others particularly when they had joined the various social events in the communities, for example:

*"We love to have a party. Some diabetic patients love to join us, although they know most of our food constrained high sugar and oily."* (Caregiver M)

Some of diabetic patients had to drink high sugar energy drink for increasing their energy to work in the orchard, for example:

*"I need energy to work in the orchard. So, I have to drink M-150 two bottles daily."* (Patient S)

**DISCUSSION AND CONCLUSIONG**

Health literacy is critical to empowerment by improving people's access to health information and their capacity to use it effectively. Improving health literacy of diabetic patients, the collaboration among various units at the health facility is necessity.

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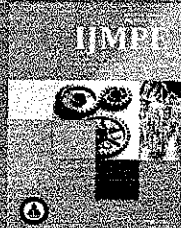
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**REFERENCE**

- International Diabetes Federation ( 2013). "Diabetes: Facts and figures", Retrieved November 29, 2014: <http://www.idf.org/worlddiabetesday/toolkit/gp/facts-figures>.
- American Diabetes Association (2007). "Nutrition recommendation and interventions for diabetes 2006: a position statement of the American Diabetes Association". Annual review of Diabetes, Pp. 132-149.
- Ad Hoc Committee on Health Literacy for the Council on Scientific Affairs, American Medical Association. 1999. *Health Literacy: Report of the Council on Scientific Affairs*. JAMA 281(6):552-557.
- Gazmararian JA, Baker DW, Williams MV, Parker RM, Scott TL, Green DC, Fehrenbach SN, Ren J, Koplan JP. 1999. *Health literacy among Medicare enrollees in managed care organization*. JAMA 281:545-551.
- Schillinger D., Grumbach K., Piette J., Wang F., Osmond D., Daher C., Palacios J., Sullivan D.G., and Bindman B.A. (2002). *Association of Health Literacy with Diabetes Outcomes*. American Medical Association. 288: 475 - 482.
- Williams MV, Baker DW, Parker RM, Nurss JR. (1998). *Relationship of functional health literacy to patients' knowledge of their chronic disease: a study of patients with hypertension and diabetes*. Arch Intern Med 158:166-172.
- Passche-Orlow K.M., Wolf S.M. (2007). *The Causal Pathways Linking Health Literacy to Health Outcomes*. Am J Health Behav. 31(suppl 1):S19-S26.
- Williams M.V., Parker R.M., Aaker DW, Coates W, Nurss J. (1995). *The impact of inadequate functional health literacy on patients's understanding of diagnosis, prescribed medications, and compliance* [abstract]. AcadEmerg Med 2(386).
- Kalichman SC, Rompa D. (2000). *Functional health literacy is associated with health status and health-related knowledge*

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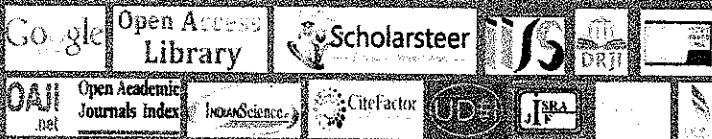
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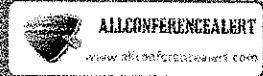
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