The Correlation Between Level of Diabetic Patients' Knowledge with Quality of Life in Patients with Type 2 Diabetes Mellitus at Haji Adam Malik Hospital Medan

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Abstract
Diabetic complications is usually asssociated with low quality of life in diabetic patients. Knowledge of diabetes become an important role in the management of people with diabetes, at least in self-care to prevent further complication. With a better knowledge about diabetes, people with diabetes will have better self-care in diabetic treatment in order to have better quality of life. This study aimed to evaluate the correlation between the level of diabetic patient's knowledge and quality of life in patients with type 2 Diabetes Mellitus at Haji Adam Malik Hospital Medan. Ninety subjects were recruited by consecutive sampling technique at outpatients of Endocrinology and Metabolism clinic, Internal Medicine Department Haji Adam Malik Hospital. The level of knowledge about diabetes was assessed by using validated questionnaires, and quality of life was assessed by using the WHOQOL-BREF questionnaire. Pearson correlation was used for statistical analysis. Results showed that majority of patients have a average level of diabetes knowledge (42,2%). Quality of Life was measured by four domains based on the WHOQOL-BREF. The overall quality of life shows that majority of patients have average level quality of life (50%). In the domain of physical health, 65.6% patients have poor level quality of life. Majority of patients have good level quality of life in the domain of psycology (48.9%), social relationships (42.2%) and environment (50%). There was positive correlation between level of knowledge and quality of life (r = 0.239, p<0.005). Conclusion This study showed that better knowledge of diabetes could improve quality of life of patients with type 2 diabetes. It is recommended that diabetic patients should improve their understanding about diabetes.
Key words: Diabetes Mellitus, patient's knowledge, quality of life, WHOQOL-BREF.

Introduction
Diabetes Mellitus (DM) is a chronic metabolic disease caused by the body's inability to produce insulin as needed or because of ineffective use of insulin or both. It is characterized by high blood sugar levels or hyperglycemia (PERKENI, 2011). At this time, There is an increase in diabetes prevalence in worldwide. In 2013, there were 382 million people worldwide who suffer from diabetes aged 40-59 years and is expected to continue to increase every year. IDF regional data show that Southeast Asia has the second highest number of diabetic patients in the world with 72 million cases. In 2035 this figure is expected to rise 70.6% to 122.8 million cases (Kemenkes, 2013).

Indonesia ranks 7th in the world in term of diabetic patients (Kemenkes, 2013). According to Riskesdas report (basic health research), currently the prevalence of diabetes in Indonesia who have been diagnosed by doctors was 1.4%, this number is expected to increase continuously (Kemenkes, 2013). WHO estimates that 21.527.000 Indonesian population will suffer from diabetes in 2030. The main factor causing the increase in the number of people with diabetes is a lifestyle change. Lifestyle changes include dietary changes, increased levels of stress, and a sedentary lifestyle (WHO, 2013). According to Riskesdas report, increased prevalence of diabetes also occurred in the North Sumatera province. The prevalence of diabetes in North Sumatera in 2012 was 1.8% (Kemenkes, 2013). Diabetes is also known as "life-long disease" because the disease can not be cured over the span of life of the patients. Diabetes is a chronic disease that requires lifelong medical treatment and change of lifestyle to prevent morbidity of complications and occurrence of death (Ayele et al., 2012).

Complications associated with diabetes is the leading cause of patient's handicap and death, and has a significant impact on quality of life and productivity. The study results showed diabetes can increase the risk of heart disease and stroke. Approximately 50% of deaths caused by diabetic cardiovascular disease. Blood flow disorders, peripheral neuropathy increases the risk of foot infection and ulceration. Diabetic retinopathy is a major cause of blindness in people with diabetes. Approximately 1% of the world population of blindness caused by diabetes. Diabetes is also one of the main causes of kidney failure. According to WHO, diabetes increases the risk of death by twofold compared to healthy people (WHO, 2010). Complications of diabetes can be prevented by maintaining blood glucose levels, blood pressure and blood cholesterol levels within normal limits (Kemenkes, 2013).

The goal of diabetes management in general is the loss of the sign and symptom of diabetes and maintaining the patient's comfort and health, and prevent complication progressivity, microangiopathy, macroangiopathy, and neuropathy with the final goal of reducing morbidity and mortality. For that purposes the oatient should control hyperglycemia, blood pressure, weight, and lipids, through the management of patients holistically by teaching self-care and behavior change, ie with meal planning (diet), exercise (sports), blood glucose monitoring, pharmacology treatment (if necessary) and others that can be obtained in a hospital or diabetes clinic (PERKENI, 2011).

The level of knowledge of people with diabetes have an important role in the management of diabetes, especially in the prevention of diabetes complications. The higher the level of knowledge a people with diabetes the better ability to perform self-management that would avoid complications. Some studies suggest that not all people with diabetes have a good knowledge of the disease so that diabetes complications incidence still remains high. Diabetics who experience complications will have a worse quality of life compared to those without complications (Kiadaliri et al., 2013).

Materials and Methods
Procedure
This study is an analytical study that aims to determine the correlation between the level of knowledge of diabetic patients with quality of life in Haji Adam Malik Hospital in 2014. The population in this study were outpatients of Endocrinology and Metabolism clinic Haji Adam Malik Hospital in 2014. The subjects were 90 people whom recruited by consecutive sampling technique.

The research instrument
The instrument of this study using questionnaires to interview method. The level of knowledge about diabetes was assessed by using questionnaires that have been used in previous studies by Daren Anderson and Joan Christison-Lagay (2008) which has been translated into Indonesian and tested for the validity and reliability on previous study by Yuni Thiodora Gultom (2012). Knowledge that is assessed include: knowledge of diet, oral diabetes medications, physical exercise, blood sugar monitoring, and knowledge related to diabetes in general. To assess the quality of life of people with diabetes use WHOQOL-BREF questionnaire that has been translated into Indonesian and has proven validity and reliability. The questionnaire consisted of 26 questions covering the assessment of each domains of quality of life which are physical health domain, psychological domain, social relationships domain, and environment domain.

Data analysis
Descriptively, the data will be presented in frequency distribution table of knowledge level and degree of the quality of life of patients. Analytically Pearson correlation test will be used to assess the relationship between the level of knowledge and quality of life. Data analysis will be done using SPSS (Statistical Package for the Social Sciences).

Results and Discussion
Table 1. Age characteristics of subjects

Age Category	Frequency	%
Late adolescence (17-25 years old)	0	0
Early adulthood (26-35 years old)	4	4.4
End adult (36-45 years old)	26	28.9
Early elderly (46-55 years old)	24	26.7
End elderly (56-65 years old)	15	16.7
Elderly (> 65 years old)	21	23.3
Total	**90**	**100**

Table 1 showed that most of diabetic patients in this study aged 36-45 years old as many as 26 people (28.9%).

Table 2. Level of Patients Knowledge about Diabetes

Knowledge level	Frequency	%
Good	34	37.8
Average	38	42.2
Poor	18	20
Total	**90**	**100**

Table 2 showed that the majority of patients had average level of knowledge, as many as 48 people (42.2%). Subjects with good level of knowledge amounted to 34 people (37.8%) and subjects with poor level of knowledge amounted to 18 people (20%)

Table 3. Level of Quality of Life of Diabetic patients based on domain assessed

Domain	Quality of Life level, n (%)		
	Good	Average	Poor
Physical Health	22 (24.4)	59 (65.6)	9 (10.0)
Psychology	44 (48.9)	35 (38.9)	11 (12.2)
Social relationship	38 (42.2)	33 (36.7)	19 (21.1)
Environment	45 (50.0)	32 (35.6)	13 (14.4)

Table 3 showed that mostly subjects had only average level quality of life in physical health domain as many as 65.6% of subject. But the good thing is that most of the subjects had good level quality of life in psychology, social relationship, and environment domain with a number of 48.9%, 42.2%, and 50%, respectively.

Table 4. The average score of the quality of life based on the WHO

Domain	Average score (N=90)
Physical Health	54.36
Psychology	61.73
Social relationship	56.56
Environment	60.90

Table 4 showed that patients with DM in Haji Adam Malik Hospital had the lowest average score on the physical health domain with a score of 54.36, while the domain with the highest average score was psychological domain with a score of 61.73.

Table 5. Levels Diabetes Quality of Life in General

Quality of Life	Frequency	%
Good	37	41.1
Average	45	50.0
Poor	8	8.9
Total	90	100

Table 5 showed that 45 people (50%) had average level quality of life, 37 people (41.1%) had good level quality of li, and 8 people (8.9%) had poor level quality of life.

Table 6. Relationship between Level of Knowledge with Level of Quality of Life

Knowledge level	Quality of Life level			Total
	Good	Average	Poor	
Good	3	12	3	**18**
Average	4	21	13	**38**
Poor	1	12	21	**34**
Total	8	45	37	90

Table 6 showed that diabetic patients with poor knowledge level were 18 subjects, which three of them had poor level quality of life, 12 subjects with average level of quality of life and three subjects with good level of quality of life. Diabetic patients with average knowledge level were 38 subjects which four of them have poor level of quality of life, 21 subjects had average level of quality of life and 13 of them had good level of quality of life. Diabetic patients with good level of knowledge were 34 subjects which one of them had poor level of quality of life, 12 subjects had average level of quality of life and 21 subjects had good level of quality of life.

The data statistical analysis using Pearson correlation showed that there is relationship between the level of knowledge of diabetic patients with quality of life in Haji Adam Malik Hospital in 2014 with a significance coefficient of 0.239 (p value <0.05).

Knowledge of Diabetic patients
Results of this study on the level of knowledge suggest that the majority of patients with diabetes who routinely came to outpatient clinic of Haji Adam Malik Hospital in Medan has average level of knowledge (42.2%). Mufunda et al. (2012) found that diabetic patients in Zimbabwe have an average level of knowledge with a number of 63.8%. In addition, research Alaboudi et al. (2014) about the level of knowledge of diabetic patients in Saudi Arabia also showed the same results with a number of 64.6%.

The level of knowledge of diabetic patients may be influenced by many factors, such as age, education level, availability of information, the doctor-patient communication. Patients who have a good level of education normally will be able to capture the information well so that will increase the understanding of the disease. (Alaboudi et al., 2014).

Diabetic patient's Quality of Life
According to the WHO quality of life is individual perception of the presence or position in life in the context of culture and belief systems espoused and related goals, expectations , standards, and concerns. Quality of life assessment was conducted using questionnaires WHOQOL-BREF which divides the quality of life into four domains, namely domain physical health, psychology, social relationships, and environment.

This present study results showed that the average score of the quality of life of patients with DM in Haji Adam Malik Hospital Medan is 58.39 with a standard deviation of 16.38. If grouped the patients with good level quality of life is equal to 41.1%, average level quality of life is 50% and poor level quality of life is 8.9%. This figure shows that only a few patients with DM who experience deterioration in quality of life due to diabetes. This may be caused by the incidence of complications is low in patients with DM in Haji Adam Malik Hospital because the incidence of complications has a huge impact on the quality of life of people with diabetes. DM complications with the greatest impact on quality of life is ischemic heart disease, stroke, and neuropathy (Solli et al., 2010).

Quality of Life of Patients with Diabetes in Physical Health Domain
Patients with diabetes at Adam Malik Hospital has a low value on physical health domain. This result is consistent with a study by Odili et al. (2009) conducted at the University of Benin Teaching Hospital. Study by Eljedi et al. (2008) also showed that the domain with the lowest score is the physical health domain. This is caused by diabetics feel a disturbance in daily activities due to dependence on the drug substance (antidiabetics) and medical assistance. Patients also felt less energized and feel easily tired, it results in reduced mobility and decreased ability to work. Some diabetic patients also complain of pain and discomfort they experienced as a result of complications of diabetes.

Quality of Life of Patients with Diabetes in Psychological Domain
The results showed the highest average score is in the psychological domain (61.73), this proves that diabetic patients in Haji Adam Malik Hospital had better satisfaction on aspects of self-image (bodily image) and appearance, rare negative feelings, more positive feelings, better self esteem, thinking spirituality and ability, learning, memory and good concentration. This condition can occur because of Indonesian society is a society with a very strong support system of family and religion. Strong family support is associated with better patient's psychological adaptation against the disease (Odili et al., 2009). So that if one family member suffers a serious illness such as diabetes, then the other family member will provide support and motivation to him so that the patients will have feeling that he can still be wellcome in the environment. In another study conducted in Neyshabur Iran, psychological domain is the domain of the lowest quality of life (Gholami, 2013). This indicates that the individual's perception of quality of life may differ between cultures and between countries (Banu-Issa, 2010).

Quality of Life of Patients with Diabetes in Social Relationship Domain
Social relationships domain has the second lowest of average score (56.56). This domain assesses aspects of personal relationships, social support and sexual activity. Sexual dysfunction may occur in diabetic patients both women and men. The prevalence of sexual dysfunction in men with diabetes was 68% (Peter et al., 2012). Sexual dysfunction also occurs in women who have diabetes with a prevalence of 75% (Mezones-Helgui et al., 2008). Sexual dysfunction causes a decrease in the quality of life and is associated with the incidence of depression and anxiety in the sufferer (Mohammed et al., 2009). In this present study low score in this domain showed dissatisfaction diabetic patients in aspects of personal relationships, sexual activity and social support.

Quality of Life of Patients with Diabetes in Environment Domain
Environment domain has an average score which is quite good compared to the physical health domain and social relationship domain. This is consistent with previous studies conducted by Odili (2009) and Eljedi (2006). One aspect of the assessment in this domain is the accessability and quality of health and social care. In this presnt study the diabetic patient's satisfaction in accessing health care and quality of services provided is reflected in the score of this domain and it is observed by investigators when conducting interviews with respondents in research data retrieval. Another aspect that is assessed in this domain is a social relationship. High scores in this domain may be caused by

the support given by families of patients because of Indonesian society is a society with a high sense of family relationships and a strong family care giver support system.

The average score of the domain and its quality of life varies between studies and between countries. This is a proof that the quality of life is a subjective concept and perceived differently by each individual and is influenced by the local culture (Banu-Issa, 2010). For example, studies on the quality of life of diabetic patients in the United Arab Emirates indicate good quality of life, this is caused by several factors such as the country's public revenues are very high, intimacy between family and close relationships between family members and the political stability of the country (Bani -Issa, 2010). Therefore, the assessment of quality of life in patients with DM in Indonesia may give variable results because of the many tribes and culture of Indonesia.

Relationship between Knowledge Level with Quality of Life
This present study results showed that there is relationship between the level of knowledge with quality of life of diabetics in Haji Adam Malik Hospital. This result is consistent with study by Silitonga (2012) conducted at the Polyclinic Hospital Dr. Sardjito, Yogyakarta. In the study, Silitonga stated that knowledge of health information about diabetes disease is a factor that most affects the quality of life of patients. Influence the level of knowledge on the quality of life may be associated with a low incidence of complications in diabetic patients with a good level of knowledge. Diabetic patients with a good level of knowledge must be able to oversee and manage the disease well thus reducing the incidence of diabetic complications and improve quality of life.

Conclusions
This present study concluded that better knowledge of diabetes could improve quality of life of type 2 diabetic patients. It is recommended that diabetic patients should improve their understanding about diabetes.

In this present study, it can found that there is a correlation between the level of knowledge with the quality of life of diabetic patients. Based on that result the knowledge of diabetic patients about their disease should be improved through counseling and discussion between doctor and patient. The physicians are expected to play an active role and establish a good communication.

Acknowledgements

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