Research Article

KNOWLEDGE, ADHERENCE AND QUALITY OF LIFE AMONG TYPE 2 DIABETES MELLITUS PATIENTS

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ABSTRACT

Type 2 diabetes mellitus is a chronic disease that can be controlled to improve quality of life. The aims of this study were to analyze the relationship between knowledge, adherence and quality of life in diabetic patients. A cross-sectional survey was conducted in the out-patients department of Regional Hospital in Bantul, Yogyakarta Province, Indonesia. Data were collected between September and October 2017 using quota sampling. Knowledge was assessed using DKQ 24, adherence was assessed using ProMAS, while quality of life was assessed using EQ-5D-5L. Of total 200 patients, majority were female (58%), age ≥ 60 years (61.5%), unemployed (66.5%), first grade education (39%), monthly income > IDR 2 million (38.5%), diagnosed DM type 2 for 5-10 years (36%), without complication (68%), consume 4-6 drugs (57%), prescribed combination of oral and insulin (46.5%) and experienced of adverse events (55%). Patients were in the moderate knowledge (61%), moderate to high adherence (47.5%) and the average of patient's utility score was 0.793 with the biggest problem was on the pain/discomfort dimension. There is relationship between gender, education, income and duration of diagnosed type 2 DM with knowledge level (p<0.05). The relationship between gender, complications and number of drugs with quality of life was found (p <0.05). Adherence was also related to quality of life (p<0.01) and correlation coefficient of 0.307. These results indicate that health care personnel still need to pay attention on factors influence the level of knowledge, adherence and quality of life.

Keywords: Type 2 diabetes mellitus, knowledge, adherence, quality of life.

INTRODUCTION

Diabetes mellitus is a metabolic disease caused by the failure of insulin secretion, decreased insulin secretion or insulin resistance. Diabetes mellitus is characterized by hyperglycemic conditions due to a decreased ability to alter or use glucose as energy.[1] Type 2 diabetes mellitus (T2DM) is a chronic, controllable but non-curable disease. The success of therapy can be observed from the controlled blood sugar level, HbA1C and improving the quality of life of patients. Health-related quality of life (HRQoL) is an outcome based on the patient's assessment or perspective related to health perceptions, feelings of comfort and functional abilities (physical, mental and social) for specific diseases and/or therapeutic regimens.[2] One of the factors influences the improvement of quality of life of type 2 diabetes mellitus patient is patient compliance in both of pharmacology and non-pharmacology therapy. According to previous research,[3-5] the higher adherence imposed the better quality of life. In addition, social demographic factors, medications and disease characteristics (complications, comorbidities and prolonged illness) are also associated with quality of life.[6, 7]

Social demographic factors directly affect the knowledge of patients with type 2 diabetes.[8] Patient's adherence to treatment may also be influenced by social demographic factors of the patient.[9] Duration of drug use, health knowledge of diabetes and treatment regimen is also one of the factors that significantly influence adherence.[10-12] It was found that patients with insulin

regimens had a better quality of life than patients with oral antidiabetics. Long suffering from diabetes, the presence of complications and comorbidities also affect the patient's adherence to treatment.[10-13] The aims of this study were to analyze the relationship between knowledge, adherence and quality of life in patients type 2 diabetes mellitus.

MATERIALS AND METHODS

A cross-sectional study was conducted from September to October 2017 in the outpatients department of Regional Hospital in Bantul District, Yogyakarta Province, Indonesia. This study was approved by the Medical Research Ethics Committee, Faculty of Medicine, Universitas Gadjah Mada following Declaration of Helsinki Guideline, with an approval number KE/FK/0267/EC/2017. Number of patients recruited in this study was 200 patients, using quota sampling technique, with inclusion criteria were patients who diagnosed with type 2 diabetes mellitus (T2DM) for over 3 months, with or without complications, and had a complete medical record.

A set of translated and validated questionnaire is used, consisted of Diabetes Knowledge Questionnaire (DKQ)-24 to measure knowledge, Probabilistic Medication Adherence Scale (ProMAS) to measure adherence and Euro Quality of Life Five Dimensions Five Levels (EQ-5D-5L) to measure quality of life. We used Spearman Rho correlation test to see the relationship between variables of knowledge, adherence and quality of life.

Relationship between socio-demographic variables, prescribing pattern with knowledge and adherence was using Spearman Rho. The relationship between sociodemographic factors and prescribing pattern with quality of life was assessed using Mann-Whitney and Kruskal-Wallis tests.

RESULTS

Patient characteristics

Most of respondents were female (58%), age ≥60 years (61.5%), primary educational level (39%), unemployed (66.5%) and monthly income >2 million rupiah (40%). About 36% of respondents were diagnosed with T2DM for 5-10 years and without complication (67.5%).

Almost respondents consumed 4-6 drugs (57%), with combination regimens of oral and insulin (47%). They experienced adverse events (55%) and the most common side effects experienced by all patients were hypoglycemia (55%). Knowledge as measured with DKQ 24 questionnaire showed that most of patients (61%) had a medium knowledge level with no patients has a poor knowledge level. Patients were in moderate to high adherence (47.5%) and no patients with low adherence.

Relationship between patient characteristics with knowledge, adherence and quality of life

The relationship of characteristics with knowledge, adherence and patient quality of life is shown in Table 1. There was a significant correlation between sex, education, income, and duration of diagnosed with knowledge ($p<0.05$), but no correlation with adherence ($p>0.05$). The results showed that female, age ≥60 years, unemployment, high education level, income > IDR 2 million, diabetes >10 years and without complications had higher adherence mean scores than other groups.

This study found that the subjects had an average utility score of 0.793. When we were looking at the average of utility score, the group of male patients had higher utility score than female counterpart (0.82 and 0.78 respectively). Mean of the quality of life in patients without complications was also higher than in the complication group (0.82 and 0.75 respectively). There is relationship between sex, complication with quality of life ($p<0.05$).

Relationship between knowledge level with adherence and quality of life

The adherence mean scores were higher in patients with high knowledge level (14.05) compared with other groups as shown in Table 2. There is no significant relationship between knowledge and adherence ($p=0.703$, $r=0.027$), knowledge and quality of life ($p=0.165$). The utility score in the group with higher knowledge level (0.81) is greater than the other groups.

Other factor related to quality of life was patient adherence ($p<0.001$, $r=0.307$) means that the higher the level of adherence then the value of utility is also getting better, as shown in Table 3.

Table 1: Relationship between patient characteristics with knowledge, adherence and quality of life

Characteristics of variables	Level of Knowledge (n=200)				Adherence (n=200)				EQ-5D-5L Utility	
	Mean (SD)	*p value*	*r*		Mean (SD)	*p value*	*r*		Mean (SD)	*p value*
Gender										
Male	15.24 (2.91)	0.034*	0.150		14.09 (2.30)	0.586	-0.039		0.78 (0.13)	0.012*
Female	16.14 (3.29)				13.79 (2.72)				0.82 (0.14)	
Age										
< 60 years	15.79 (3.10)	0.273	-0.078		13.77 (2.47)	0.070	0.129		0.79 (0.13)	0.498
≥ 60 years	15.50 (3.10)				14.09 (2.49)				0.80 (0.13)	
Employment Status										
Employed	15.80 (3.24)	0.072	-0.127		13.73 (2.29)	0.411	0.058		0.81 (0.13)	0.222
Unemployed	15.52 (3.03)				14.09 (2.57)				0.79 (0.14)	
Level of education										
Primary	13.58 (2.17)	< 0.001*	0.475		13.93 (2.75)	0.943	0.005		0.80 (0.13)	0.767
Secondary	15.90 (2.83)				13.89 (2.46)				0.79 (0.14)	
Tertiary	17.59 (3.15)				14.17 (2.19)				0.80 (0.13)	
Monthly income										
< 1 million rupiah	14.39 (2.69)	0.002*	0.385		14.31 (2.25)	0.877	-0.011		0.78 (0.15)	0.775
1-2 million rupiah	15.17 (2.87)				12.81 (2.92)				0.80 (0.12)	
> 2 million rupiah	17.13 (3.02)				14.34 (2.21)				0.81 (0.13)	
Duration of diagnosed with T2DM										
< 5 years	14.82 (2.59)	0.002*	0.223		13.98 (2.51)	0.530	0.045		0.81 (0.14)	0.229
5-10 years	15.42 (3.27)				13.86 (2.46)				0.80 (0.14)	
> 10 years	16.55 (3.15)				14.07 (2.51)				0.77 (0.13)	
Complication										
Yes	15.69 (3.15)	0.842	-0.014		13.64 (2.87)	0.425	0.057		0.75 (0.12)	<0.001*
No	15.58 (3.10)				14.12 (2.27)				0.82 (0.13)	

Note: *significant at p<0.05

Table 2: Relationship between knowledge level with adherence and quality of life

Knowledge Level	Adherence (n=200)			Quality of Life /Utility (n=200)		
	Mean (SD)	p value	r	Mean (SD)	p value	r
Low (0-8)	0	0.703	0.027	0	0.165	0.098
Moderate (9-16)	13.93 (2.48)			0.79 (0.14)		
High (17-24)	14.05 (2.50)			0.81 (0.13)		

Table 3: Relationship between adherence and quality of life

Adherence Level	Quality of Life/Utility (n=200)		
	Mean (SD)	p value	r
Low (0-4)	0	< 0.001*	0.307
Medium-low (5-9)	0.77 (0.22)		
Medium-high (10-14)	0.79 (0.13)		
High (15-18)	0.80 (0.14)		

Note: *significant at p<0.05

DISCUSSION

This study finding highlight that male patients, higher education, higher income and diagnosed over 10 years correlated with better knowledge. These results are in accordance with previous research.[8, 14-16] This can be due to the ability to access health information so that it is positively correlated with the level of knowledge. The longer patients suffer the disease, they get information from health workers are also more intense. This study shown that there were no patients with low knowledge level, but there were still 80% of patients think that T2DM can be cured. From this result, all of health worker must be aware and can provide more education about T2DM disease and its treatment.

According to adherence score, female patients, age ≥60 years, unemployed, high education level, income IDR > 2 million, diabetes > 10 years and without complications had higher compliance scores than other groups. Female patients in the study were largely unemployed resulting in a higher adherence rate than men. The results are consistent with earlier research[17] which found similar results where women have higher adherence. Age is associated with patient adherence with the patient's readiness to receive the illness and lifelong treatment regimen after being diagnosed with diabetes [18]. According to study conducted by Rolnick et al.[9, 18] and Kirkman et al. ,[13] patients with older age were tend to had higher level of adherence to treatment.

Patients with working status can result in the patient forgetting or being late in taking the drug [19]. In contrast, patients who not employed will had higher compliance scores. Higher education and income enable patients to access information. Higher education levels and higher incomes affected adherence were also found in Attyia et al.,[20] Abebaw et al.,[10] and Manobharathi et al.,[21]. Tiv et al.[22] found that patients with complications had lower levels of adherence than patients without complications. It can be explained that patients with low level of adherence increased possibility of complications occurred.

Patients who prescribed with 1-3 drugs, take oral antidiabetic regimens and never experiencing medication side effects have higher adherence rates. Research by Manobharathi et al.,[21] and Attyia et al.,[20] also confirmed that the more drugs patient received the lower level of adherence. Zioga et al.,[4] found similar results that patients receiving oral antidiabetic drugs had higher levels of adherence than patients with insulin regimens or a combination of insulin and oral. The results may be due to more practical for patients taking oral antidiabetic when compared with the use of insulin or a combination. Sajith et al.,[9] and Manobharathi et al.,[21] also stated that side effects may affect adherence where patients who have experienced side effects will decrease the level of adherence.

When looking at the average of utility values, the group of male patients had higher utility score than female. The results are consistent with the study by McCaffrey et al.,[23] and Safita et al.,[24] found that the quality of life for men was better than women. Possible factors explained that men have better social life and better physical activity than women.[25] Quality of life in patients without complications was also higher. The incidence of complications can cause disturbance in each dimension of the quality of life so that it can lead to decreased quality of life. Furthermore, the number of drugs is related to the quality of life in which quality of life is best obtained in patients with the least amount of drugs. The fewer the number of drugs can indicate less complications or comorbidities experienced.

There was no significant correlation between knowledge level and compliance and quality of life. However, we found that the higher level of knowledge, the compliance rate and utility scores are also increased. This is in accordance with the studies conducted by Kossioris & Karousi,[6] in which that the high knowledge of patients on health directly affect the quality of life of patients. Several studies have found a positive correlation between the knowledge with patient adherence in type 2 diabetes. Previous studies[9, 26] found a positive correlation between knowledge and quality of life, especially in physical health and the patient's social relationships domains.

Other factors related to quality of life according in this study were patient adherence (p <0.001, r 0=307 which means that the higher level of adherence, the value of utility is also better. The results are also supported by previous research[27] that the level of adherence has a positive correlation with the quality of life. Adherence to treatment has an effect on quality of life mediated by reduced complications occurred. Adherence is a factor can be altered so that in this case a pharmaceutical care is required to motivate patients and increase their understanding of the drug and the consequences then can improve patient adherence.

CONCLUSION

Our study concluded that patient characteristics and prescribing pattern affected level of knowledge and quality of life of T2DM patients. Sex, education, income and duration of diagnosed T2DM have significant correlation with knowledge level. Factors affected quality of life were sex, complication and number of drugs. There is no relationship between level of knowledge, adherence and quality of life, but adherence to prescribed

medication was positively associated with quality of life. All health workers must be aware and provide education and counseling about T2DM disease and its treatment.

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