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Evaluation of adherence, distress and quality of life for type 2 diabetes melitus patients In Puskesmas Wedarijaksa I and Puskesmas Trangkil Kabupaten Pati

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ABSTRACT

Diabetes mellitus is chronic disease that needs the complex and a long term medical treatment. Patient adherence and level of distress can affect patient quality of life. The purposes of this study is to examine patients adherence, distress, and quality of life patients type 2 diabetes mellitus in Kabupaten Pati. This study used cross sectional design and data patients collection techniques were conducted prospective data. The subjects of research were patients with Type 2 diabetes amounted to 126 people. Instruments used in this research is Medication Adherence Respon Scale (MARS) questionnaire to measure patients adherence, Diabetes Distress Scale (DDS) to measure distress, and EQ-5D-5L questionnaire to measure quality of life. Data analysis statistic used Mann Whiney test, and linier regression. This study was dominated by female patients 78.6%. The mean age of DMT2 patients was 54.49 ± 6.19 years. The average value of adherence (MARS) was 21.33 ± 2.90 including in moderate adherence. The mean total of DDS score was $1,56 \pm 0,42$ including not distress level and the highest is the emotional burden domain. The mean value of EQ5D5L index was 0.729 ± 0.161 . The results showed a significant association ($p < 0.05$) between patient characteristics age and duration of sick with adherence. There were significant association ($p < 0.05$) between age to physician distress, gender with emotional, marital status with emotional and interpersonal distress, duration of sick to physician distress and management therapy distress. Marital status and income had significant relationship to quality of life. Emotional burden domain had significant relationship to quality of life. Multivariate analysis showed that the relationship of adherence and distress by the emotional burden to quality of life. This study concluded the significant relationship between adherence, distress and quality of life.

Keywords: type 2 DM, adherence, distress, quality of life

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INTRODUCTION

Diabetes mellitus is chronic disease that occurs when pancreas does not produce enough insulin or when the body does not effectively use the resulting insulin. Diabetes is the leading cause of death of 1,2 million people worldwide in 2012. International Diabetes Federation (IDF) predicts an increase in the number of people with diabetes in Indonesia from 9,1 million in 2014 to 14,1 million in 2035 (Perkeni, 2015). Increasing the number of people with diabetes due to various factors including the patients adherence in term of treatment. Cause of poor adherence are complex, including the complexity of treatment regimens, drug cost, age, low social support and cognitive problems (WHO, 2003). Rizkifani *et al.* (2014) reported that adherence of type 2 diabetes mellitus patients receiving monotherapy and combination of oral insulin antidiabetic therapy had moderate adherence of 23,54.

Long term medical treatment of diabetes mellitus can affect emotional distress of diabetes mellitus patients. Permana (2017) show that patient who are sick more than 10 years, the level of distress of patients are mostly mild, while the components distress of the most dominant of the onset of distress to the patient is the emotional burden and response to health workers, and there is a relationship between a long illness at the level of distress in patients with diabetes mellitus (p-value = 0.001) where the longer sick, the lower the level of distress.

Patients adherence level with distress or emotional can affect patients quality of life. Improve quality of life is characterized by free of complaints, normal body function, daily activities not disturbed, can be social functioning, and others (Spilker and Cramer, 1998). Pradana (2013) research about the quality of life of elderly patients in Dr. Karyadi Semarang shows the average of quality of life with EQ VAS $72,92 \pm 10,14$. Patients quality of life using EQ5D questionnaire show there are many problems with 1,9 % mobility domain, 2,8% self care, 2,8% daily activity, and 0,9% depression.

Soegondo (2010) explain that the type of health services provided by Puskesmas to type 2 diabetes mellitus patients is primary health care, that is affordable, cheap, easy, practical health services, and appropriate with basic standard medication in Puskesmas. Based on description, it is necessary to evaluate adherence, distress and quality of life diabetes mellitus patients at Puskesmas Wedarijaksa I and Puskesmas Trangkil.

MATERIALS AND METHODS

The research was a cross sectional design in the treatment of type 2 diabetes mellitus patients at Puskesmas Wedarijaksa I and Puskesmas Trangkil in period August-November 2017. The subjects of research were patients with Type 2 diabetes amounted to 126 people. Instruments used in this research is Medication Adherence Report Scale (MARS) questionnaire to measure patients adherence, Diabetes Distress Scale (DDS) to measure distress, and EQ-5D-5L questionnaire to measure quality of life

MARS have five questions on a frequency scale of 1 to 5 (always, often, occasionally, rarely, and never) (Molloy *et al.*, 2012). The DDS consist 17 questions in 4 domains, emotional burden, physician distress, regimen distress, and interpersonal distress. DDS have frequency scale of 1 of 6. If the average total score of less than 2,0 indicates no pressure, score between 2,0-2,9 indicates moderate pressure, score of 3,0 or more indicates a level high pressure (Gonsky *et al.*, 2005). The EQ-5D questionnaire consist of 6 items covering 5 health dimensions: mobility, self-care, regular activity, pain/discomfort, and anxiety/depression where each question has a value/score. The highest score is assigned of 1 and the lowest score is assigned a value of 5 (Horowitz *et al.*, 2010).

Univariate analysis used proportion or average value. The bivariate analysis used Mann-Whitney test for two-group data. Multivariate analysis used multiple linear regression test. This study received ethical approval from the Research Ethics Committee of Universitas Ahmad Dahlan.

RESULT AND DISCUSSION

Characteristics of patients with T2DM in Puskesmas Wedarijaksa I and Trangkil can be seen in Table I.

Table I. Patient distribution

Characteristics (n=126)	Mean ±SD	
Mean age (SD), year	54,49±6,19	
Mean duration / duration of treatment of T2DM (SD), year	3,95±3,27	
Characteristics (n=126)	n	Persentase (%)
Gender (%)		
a. Male	27	21,4
b. Women	99	78,6
Education (%)		
a. Lower education	80	63,5
b. Higher education	46	36,5
Marital status (%)		
a. Single/widow/divorced	7	5,6
b. Married	119	94,4
Employment (%)		
a. Employed	76	60,3
b. Unemployed	50	39,7
Income		
a. < Rp.1000.000	114	90,5
b. >Rp.1000.000	12	9,5

The results showed that the patient was dominated by female patients (78.6%). The mean age of DMT2 patients was 54.49 ± 6.186. The average of adherence type 2 diabetes mellitus patients is 21,33±2,901. Univariate analysis of MARS questionnaire T2DM patients had moderate adherence level of 83,3%. Description of statistical adherence with characteristics can be seen in Table II.

Research from Ahmad *et al.*(2013) show that increasing age of adherence is getting better. Huber and Reich (2016) stated that patients age 65 to 74 tend to be twice as likely as 18-44. Rasdianah (2016) show that the patients compliance rate for >5 years (55,9%) was higher than durations of sick patients <5 years (39,3%).

Description of statistical distress can be seen in Table III. Based on the table, it can be seen that the mean ± SD result of DDS questionnaire measurement based on 4 domains. Based the mean result in 4 domains can be seen that the emotional distress was the largest which 1,75±0,61, and interpersonal distress was the smallest which 1,20±0,46. Analysis between characteristics with emotional distress patient in Table IV.

Table II. Analysis between characteristics and patients adherence (MARS)

Characteristics	total	Mean±SD	p
Age			
45-49	32	22,88±1,930	0,003*
50-54	32	20,16±3,293	
55-59	31	21,29±2,648	
60-65	31	21,00±2,978	
Gender			
Man	27	20,44±3,401	0,137
Woman	99	21,58±2,718	
Marital status			
Single/widow/divorced	7	21,57±3,735	0,637
Married	119	21,32±2,864	
Education			
Lower education	80	21,15±2,904	0,289
Higher education	46	21,65±2,900	
Employment			
Employed	76	21,01±3,109	0,199
Unemployed	50	21,82±2,505	
Income			
< Rp.1000.000	114	21,22±2,935	0,189
>Rp.1000.000	12	22,42±2,392	
duration of sick			
<5 years	93	21,62±2,881	0,038**
>5 years	33	20,52±2,841	

*Kruskall Wallis $p < 0,05$ **Mann Whitney $p < 0,05$

Table III. Statistical description emotional distress based on DDS

Domain	(mean±SD)
Emosional burden	1,75±0,61
Physician distress	1,54±0,73
Regiment distress	1,60±0,48
Interpersonal distress	1,20±0,46

7 Bivariate analysis showed that there was significant correlation between age with physician distress ($p=0,013$), gender with emotional burden ($p=0,007$), marital status with emotional burden and interpersonal distress ($p=0,034$ and $p=0,018$), duration therapy with physician distress and regiment distress ($p=0,015$ and $p=0,004$). Analysis results between characteristics and quality of life in Table IV.

Table IV. Analysis between characteristics and patients quality of life

Characteristics	total	Mean±SD	p
Age			
45-49	32	0,764±0,113	0,071
50-54	32	0,763±0,141	
55-59	31	0,738±0,163	
60-65	31	0,650±0,198	
Gender			
Man	27	0,779±0,203	0,074
Woman	99	0,716±0,146	
Marital status			
Single/widow/divorced	7	0,598±0,131	0,032*
Married	119	0,737±0,160	
Education			
Lower education	80	0,712±0,165	0,057
Higher education	46	0,761±0,151	
Employment			
Employed	76	0,751±0,166	0,077
Unemployed	50	0,696±0,149	
Income			
< Rp.1000.000	114	0,718±0,161	0,013*
>Rp.1000.000	12	0,835±0,124	
duration of therapy			
<5 years	93	0,741±0,138	0,413
>5 years	33	0,697±0,213	

**Mann Whitney p<0,05*

Score obtain from EQ5D5L questionnaire converted into index to calculate quality of life indices. The EQ5D5L index is based on the value set for the Indonesian state (Purba, ⁶ *al.*, 2017). The average distribution value from EQ5D5L was obtained 0,71±0,16. This is show that **quality of life type 2 diabetes mellitus patients** is good. Bivariate analysis showed there is significant relationship between marital status and income with quality of life. However, the number of subjects in marital status subgroup and income subgroup differ greatly so, it can affects the statistical results.

Bivariate analysis between distress and quality of life showed there is significant relationship between emotional burden with level of distress (p= 0,029). Analysis result between level of distress with quality of life showed in Table V.

Table V. Analysis between distress with quality of life

Domain	level of distress	total	Mean±SD	p
Emosional burden	no distress	84	0,74±0,16	0,029*
	medium distres	37	0,71±0,14	
	high distress	5	0,57±0,14	
Phicisian Distress	no distress	93	0,73±0,17	0,124
	medium distres	25	0,73±0,14	
	high distress	8	0,64±0,13	
Regiment distress	no distress	95	0,74±0,16	0,236
	medium distres	29	0,70±0,18	
	high distress	2	0,63±0,10	
Interpersonal Distress	no distress	112	0,73±0,16	0,698
	medium distres	12	0,70±0,15	
	high distress	2	0,63±0,51	

*Kruskall Wallis<0,05

Multivariate analysis with linier regression between adherence, distress and quality of life have significant relationship with distress by emotional burden ($r = -0,246$) and adherence ($r = 0,231$). Coefficient determination showed 0,123, it showed that emotional burden and adherence can affect the quality of life by 17,7%. Adherence will be directly proportional because it produce positive correlation which means that the higher adherence the better quality of life. Emotional burden have negative correlation which means that the lower emotional burden the better quality of life. The study of Jannoo *et al.* (2017) showed that adherence was significantly associated with diabetes distress ($r = -0,20$; $p < 0,001$). Patients with high medication adherence levels have lower diabetes distress. Diabetes distress have significant relationship to HRQoL ($r = -0,11$; $p < 0,001$) indicated that patient with low grade diabetes distress will have higher quality of life. Table 6 showed analysis between adherence, distress and quality of life.

Table VI. Analysis between Adherence, Distress and Quality of Life

independent variable	Coefficient determination (R square)	correlation	p
Emotional burden	0,123	-0,246	0,000*
adherence		0,231	

*Anova $p < 0,05$

LIMITATIONS

The limitations of this study is the number of subjects in marital status subgroup and income subgroup differ greatly so, it can affects the statistical results. As well as the number of subjects at the distress level the number of subjects is not balanced.

CONCLUSION

The results showed a significant association ($p < 0.05$) between patient characteristics age and duration of sick with adherence. There were significant association ($p < 0.05$) between age to physician distress, gender with emotional, marital status with emotional and interpersonal distress, duration of sick to physician distress and management therapy distress. Marital status and income had significant relationship to quality of life. Emotional burden domain had significant relationship to quality of life. Multivariate analysis showed that the relationship of adherence and distress by the emotional burden to quality of life. This study concluded the significant relationship between adherence, distress and quality of life

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