

# Adherence and Quality of Life in Patients with Type II Diabetes Mellitus

Suci Nugraha, Siti Kartika Putri

Faculty of Psychology  
Universitas Islam Bandung  
Bandung, Indonesia  
sucinugraha.psy@gmail.com, kartikapsy@yahoo.com

**Abstract**—This article is a research report about the relationship between adherence to medical treatment procedures recommended by doctors with health quality of life in patients with type 2 diabetes mellitus. Adherence to medical treatment regimes is often associated with the health related quality of life. In some previous studies, it was found that the quality of life of patients with chronic diseases decreased compared to health populations. Chronic disease such as diabetes mellitus is one of the diseases that get the attention of the Indonesian government to be immediately addressed. The purpose of this study was to look at the link between the level of adherence and health related quality of life in patients with type 2 diabetes mellitus. The study was conducted at the primary health service (PUSKESMAS), using the SF 36 and Morisky Medication Adherence Scale to measure both adherence and health related quality of life. The results showed that level of adherence was in medium level, so was their quality of life. There was a significant relationship regarding the patient's adherence and health related quality of life. Adherence to treatment regimes improves better physical and psychological conditions and will ultimately improve the patient's quality of life.

**Keywords**—adherence; quality of life; health related quality of life; type 2 diabetes

## I. INTRODUCTION

WHO (World Health Organization) predicts that diabetes will become one of the most common disease carriers in 2030 [1]. In 2013, Sample Registration Survey stated that diabetes was the third 3 killer in Indonesia. The prevalence of diabetes in Indonesia tends to increase, from 5.7% in 2007 to 6.9% in 2013. WHO estimates that the number of people with type 2 diabetes in Indonesia will increase significantly to 21.3 million in the coming 2030. Diabetes mellitus is a chronic disease which is currently one of the concerns of the Indonesian Republic's Health Department. The government has a program called PROLANIS to facilitate patients to get a better quality of life. This program is intended for patients to have better knowledge of their illness and to carry out routine treatments to achieve stable health conditions. The large number of patients participating in this program, their health tends to increase. What's interesting is, there is increasing tendency to adhere to doctor recommendation before the time of examination at services. After examination, the patient reported reducing the level of compliance with the reasons for being bored, tired,

unimportant, etc. Diabetes mellitus is a disease that requires challenging adjustment. Diabetes Type 2 requires treatment that is not simple, a process that lasts for a long time and serious effort. Because of this, adherence of patients in following the treatment process is important to minimize the consequences of the disease. This condition needs to be considered given the low adherence will worsen the patient's health. Complications of the disease will reduce the quality of life of the community and will burden the economy so it is very necessary to know the quality of life and the factors involved to find a solution to this problem. A number of studies have shown that chronic disease patients adherence such as diabetics, asthma, cardiovascular disease, high cholesterol commonly low. According to WHO report 2003 average patient's adherence in long therapy for chronic disease in developed country is only 50%, while in developing country even more lower [2]. The prevalence of no adherence in diabetic patients is high, due to the duration of treatment, and may lead to an increase in mortality, morbidity, and other adverse effects [3]. Previous studies have shown that 36-93% diabetic patient has low compliance to procedures such as medication, diet, exercise etc. [4]. Reducing complication and increasing the patient's quality of life is the main target of treatment of diabetes [5]. A previous study about health-related quality of life (HRQoL) of type 2 DM patients in Bangladesh showed that some patients' characteristics like age, gender, income, education, family history, duration of DM, and treatment prescribed could affect patients' quality of life [6].

Quality of life is a multidimensional concept that is related to the appreciation of patients regarding physical, psychological and social well-being. WHO 2003 defines the quality of life as 'individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept of being affected by a complex way of physical health, psychological state, level of independence, social relationships, personal beliefs and their relationship to the salient features of their environment".

According to Saleem et al. health related quality of life is the patient perception about self-welfare related to his health condition [7]. Health-related quality of life and adherence to treatment procedures were found to be interconnected in previous studies. It was reported that patients with chronic

diseases such as diabetes who were obedient were reported to have increased quality of life and vice versa.

The relationship between health-related quality of life and adherence to health procedures has been investigated with inconsistent results. Some studies show that good quality of life is associated with high adherence in diabetes treatments [8-10], meanwhile, other studies that done by Martinez YV et al. have not shown this relationship. Martinez YV, et al. indicate this difference is related to differences in the instruments used in measuring the relationship between the two variables [11]. With the many occurrences of diabetes in Indonesia, and the small number of studies that measure these two variables, the aim of the study was to determine the relationship between the two variables in diabetic patients in Indonesia. The aim of this study is to assess treatment adherence in patients with type II diabetes, as well as the connection between adherence and quality of life.

## II. METHOD

This is descriptive and non-experimental study. It was conducted in primary health service in Bandung, Indonesia. The sample examined was a convenience sample and consisted of 66 patients with type II diabetes mellitus, who visited the service as outpatients. Data collection took place from May to June 2017. The inclusion criteria were having had diabetes for over 1 years, being over 18 years old and attending the diabetic clinic during the study period.

Adherence to treatment was measured by The eight-item Morisky Medication Adherence Scale (MMAS-8). Higher score indicating non adherence It is one of the simplest self-report scales measuring medication adherence behavior. Quality of life was measured using the Short Form- 36 Health Survey (SF-36) which has been validated for Indonesia. It consists of 36 questions. Divided into eight health concepts: physical functioning, physical role, bodily pain, general health, vitality (energy / fatigue), social functioning, emotional role and mental health. Scores range from 0 to 100, with higher scores indicating better health status. The value of SF 36 moves in the higher range shows that the quality of life is getting better. Demographic characteristics seen in this study were age, gender, education. Descriptive statistical analysis was applied to analyze data about the participants' demographics. The statistical software package SPSS-23 was used for the purpose of data analysis. The data of the present study was not normally distributed, and thus non-parametric tests were performed.

TABLE I. SAMPLE CHARACTERISTIC

|                     | N = 66    |
|---------------------|-----------|
|                     | N (%)     |
| <b>Gender</b>       |           |
| Male                | 24 (36,5) |
| Female              | 42 (63,5) |
| <b>Age</b>          |           |
| 18-34               | 3 (3,1)   |
| 35-60               | 57 (86,3) |
| 61-80               | 6 (10,6)  |
| <b>Occupation</b>   |           |
| Housewives          | 37 (56)   |
| Government Employee | 2 (3)     |

Table 1. Cont.

|                    |            |
|--------------------|------------|
| Private Employee   | 9 (13,6)   |
| Retirement         | 6 (9)      |
| Other              | 12 (19)    |
| <b>Duration</b>    |            |
| < 1                | 0 (0)      |
| 1 – 5 Year         | 41 (62, 2) |
| > 5 Year           | 25 (37,8)  |
| <b>Education</b>   |            |
| Elementary School  | 0 (0)      |
| Junior High School | 5 (7,5)    |
| High School        | 42 (63,6)  |
| Undergraduate      | 19 (28,7)  |

TABLE II. ADHERENCE AND QUALITY OF LIFE

| Adherence              | N (%)     |
|------------------------|-----------|
| Low                    | 0 (0)     |
| Medium                 | 59 (89)   |
| High                   | 7 (11)    |
| <b>Quality of Life</b> |           |
| Low                    | 4 (6,1)   |
| Medium                 | 62 (93,9) |
| High                   | 0 (0)     |

TABLE III. DOMAIN OF QUALITY OF LIFE

| Quality of life            | Mean  | St. dev |
|----------------------------|-------|---------|
| Physycal Functioning       | 66,9  | ± 11,3  |
| Physical Role Limitiation  | 5,9   | ± 11,44 |
| Emotional Well being       | 40    | ± 11,97 |
| Emotional Role Limitations | 7,4   | ± 25,4  |
| Vitalitay                  | 37,8  | ± 6,09  |
| Social Fungsioning         | 39,9  | ± 9,97  |
| Pain                       | 65,5  | ± 13,62 |
| General Health             | 23,5  | ± 7,9   |
| Total                      | 35,88 | ± 5,91  |
| Adherence                  | 6,12  | ± 1,34  |

Patients' characteristics are presented in table 1. All patients had age ranged from 18 to 60 years, with a mean of  $42.3 \pm 7,9$  years of age. The majority of patients were women (n= 42, 63.5%). More than half of the sample (n=46, 42.6%) had high school education and were housewives (n=37, 56%). Many of them (n=41, 62,2%) had been diagnosed with diabetes 1 -5 years prior to the beginning of the study period.

Table 3 shows the mean and standard deviation for MMAS questionnaire. The score displays the mean and standar deviation in middle to higher score that indicate lower adherence. This table also displays the mean and standard deviation for the SF-36 sub scales. The sub scale scores are mostly in the middle or lower range. The highest scores relate to physical functioning and bodily pain, showing that in these domain, patients were in good term. The lowest score relate to role limitation both physically and emotionally, showing that these patients were feel limitations in their life related to the disease that they had.

## III. DISCUSSION

This study measures adherence of type 2 DM patients to treatment, quality of life and the relationship between both variables'. In general, we found positive correlation between adherence and quality of life. This provides additional information about the evidence of the importance of adherence

to treatment procedures in relation to the quality of life of DM patients and provides important information to health professionals as a basis for decision making in order to determine appropriate interventions. This study shows that DM patients show moderate levels of adherence or less consistent to adhere to treatment. These results can be attributed by many factors, such as age, duration of illness, patient knowledge about monitoring their condition, their disease and its complications.

A previous study showed that demographic factors, psychological, social support; health care providers; medical systems; disease; and treatment-related factors can promote diabetic patients' adherence [12]. The results of the previous study are out line with our study, which showed that the sex and age of patients may influence patients' adherence and quality of life. This study showed that the level of adherence was similar in male and female patients and there was no statistical difference between adherence and age observed. This finding is similar to other studies [13]. In addition, the patient's education did not affect adherence, although this finding was not consistent with other studies which found that education status was associated with non-compliance [14]. This difference can be explained by the fact that research uses different methodologies and different sample sizes.

It is interesting to look for the findings in this study that DM patients carried out all treatment procedures before the time of examination by doctors. This finding can be explained by the assumption that many patients do not want to their doctors found out about their non adherence behavior. This findings demonstrate that their adherence to treatment procedures is more determined by the social consequences regardless the awareness about the importance of comply to procedures due to control their disease, to prevent complications and improve their quality of life.

As patients may avoid taking DM medication, and therefore, therapeutic effects will decrease. However, if a patient decided to continue on taking DM medication despite the unpleasant side effects, the patient may suffer during treatment. DM patients who experience complications may be given more than three types of drug, which could result in drug interaction and adverse effects [15,16]. Because of the long duration of treatment, other adverse effects such as constipation, headaches, and water retention may also result in nonadherence in diabetic patients [17]. Previous studies showed that patient's nonadherence behavior was significantly related to medication-adverse effect [16]. From the interview with patients, we understand that such issues will of course affect patient's adherence.

The average score of quality of life score is 35, 88 which indicates moderate level of quality of life. This shows that the DM patient's quality of life tends to be low. Quality of life scores for different domains vary greatly from 7.5 to 66.9. This can be explained by the fact that the patients studied have very diverse characteristics with different complications, this different from their research results. It can be explained because other studies used different questionnaires to assess quality of life, different sample sizes and uncomplicated patients.

Physical and emotional roles domain show the lowest values. While other domains such as physical function and wellbeing have higher values. It is interesting to examine that the patient's role limitations are worse than that of the patient's appreciation of his physical and inferior functions. The relationship between most of the quality of life domains and sub-compliance scales is consistent with the results of other studies [8-10]. As noted above, there are conflicting results regarding this relationship, which emphasizes the need for more research to use the same scale to achieve reliable results and help patients improve medication adherence and quality of life.

This study has several limitations. The limitation of our study was that we use purposive sampling and sample collection is carried out over a short period of time, the small sample size and there were DM outpatients recruited. We also cannot generalize our findings to all DM patients. We have conducted the interview training to all researchers involved in this study. However, we cannot standardize the information which should be deeper explored to the patients. However, because this is one of the studies that measures the quality of life in primary health care centers in Indonesia, we believe that the results are worth sharing with the research community.

#### IV. CONCLUSION

This study was identified that DM patients were less consistent in following treatment procedures, both in terms of diet, blood test, advice on self-care and exercise. The result indicate relationship between adherence and quality of life. Based on these results, we consider it is important to plan interventions to improve adherence and thus help DM patients improve their quality of life. For this purpose, patient education and their relationships with health care team must be well established. In conclusion, more research will be needed to provide more solutions to improve DM patients's quality of life. For further research, we propose intervention from doctors, pharmacists, nurses, psychologist and physicians as a health care team to work together to improve patients' adherence to treatment in outpatient and inpatients situation.

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