

## Research Article

## Impact of External Locus of Control on Quality of Life in Patients with Type 2 Diabetes Mellitus

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**Abstract: Background:** Quality of life is an illustration of an individual's livelihood, as related to daily activities, in order to own a typical life, especially with reference to health. Individuals with diabetes mellitus have a quality of life that is quite diverse and affects the health conditions of all related people. It is this point that the role of locus of control is contemplated in maintaining the quality of life for these individuals. This study aim to analyze the influence of locus of control in patients with diabetes mellitus, in relation to the quality of life they lead. **Methods:** This observational survey based study was performed by implementing a cross-sectional design. The study was conducted in type B and C hospitals and health centers of Makassar City and included 389 respondents. Data analysis was done using chi-square test. **Result:** The result showed that the locus of control had a significant effect on the quality of life of patients with type 2 diabetes mellitus ( $p < 0.01$ ;  $\alpha = 0.05$ ). **Conclusions:** People with type 2 diabetes mellitus, who had an external locus of control, were observed to be more dominant and did not own a good quality of life because such individuals are very dependent on the external environment rather than the environment within them. The result of this study also indicate that locus of control may be regarded as the basis in predicting the future quality of life of an individual.

**Keywords:** Locus Of Control, Type 2 Diabetes Mellitus, Quality Of Life

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## BACKGROUND

Diabetes mellitus (DM) is a chronic disorder caused by an increase in glucose concentration in the blood, which in turn may damage other systems of the body. The condition is increasing continually, especially in developing countries and is caused by factors like rapid population growth, aging, unhealthy diet, obesity, and sedentary lifestyles (WHO. 2018). Indonesia reports the second highest percentage of deaths caused by diabetes, after Sri Lanka, with a prevalence that tends to increase from 5.7% in 2007 to 6.9% in 2013, out of which two-thirds of patients were unaware of having the condition (WHO. 2016).

According to the Centers for Disease Control and Prevention (CDC) (2014), type 2 is the most common type of DM, accounting for 90-95% of all the diagnosed cases of diabetes and in disease control and environmental health field data of the South Sulawesi Provincial Health Office recorded 27,470 new cases of DM and 66,780 old cases with 747 cases of death resulting from DM. The highest number of cases were

found in the individuals aged 55-74 years (13.4%) (Kemenkes. Hasil Riset Kesehatan Dasar 2013). Increased cases of DM were reported, especially in the city of Makassar from January to December, amounting to 7,000 cases (Dinas Kesehatan, K.M. 2012). The incidence continued to increase from 17,746 cases in 2014 to 18,755 cases in 2015 (Dinas Kesehatan, K.M. 2015).

In order to overcome the continual increase of the disease, the need of the hour is the healthy living behaviors. This behavior is formed by several factors that can be classified as self-factors (often referred to as responses) and environmental factors (usually called stimuli) (Bloom, L. 1981). According to Green & Ottoson (2006), a person's behavior from the health point of view is influenced by behavioral factors (behavior causes) and external factors (non-behavior causes), which require management of the program through the stages of assessment, planning, intervention up to assessment and evaluation. The control is one of the factors that can determine individual behavior and health conditions. Each individual has a different power

of perception for the control factor within them; one of the personality variables that distinguish one person from another is the locus of control or control center (Wallston, K. 2001). DM control is then possible, provided that the patient has the ability to sort out the sources of information required to enter the control center (locus of control) within them.

The control center acts as a place where self-control is both is internal and external, and would then result in an act or controlled behavior. According to Rotter (1966), an individual's acceptance of various events as a part of behavior is the influence of the locus of control they own. Research that supports the relationship between the locus of control and health behavior shows that individuals actively seeking health-related information are the ones who possess an internal locus of control (Seeman, M. 1962).

Individuals who can control their health tend to practice good healthy living habits (Taylor, S.E. 2010). A person may lead to a good quality of life, based on his behavior and actions in controlling health. Quality of life itself is an analysis of the ability of an individual to acquire a normal life related to that person's perceptions of goals, expectations, standards and specific attention to life experienced, which are in turn influenced by the values and culture of the environment the individual resides in (Nursalam. 2016).

Quality of life is intended as an effort to bring judgment in obtaining health. It is defined as the individual's perception of their position in life, in the context of culture and value systems in which they reside, and the link to their goals, standard expectations, and concerns. In general, diabetes has a detrimental effect on the health of patients, especially on their quality of life. A significant decrease in the quality of life of patients is caused by complications resulting from DM (Mahmoud, S. S. et al 2018). Therefore, the authors intend to assess the influence of locus of control of patients with type 2 DM on their quality of life.

## MATERIAL AND METHODS

This study was conducted with an observational survey. The data collected from the population were analyzed to determine relative events, distribution, and relationships between the variables (Nasir, A. et al 2011). This type of explanatory research aims to analyze the relationship among variables, using a cross-sectional design (Machfoedz, I. 2013).

This study was carried out between December 2018 until February 2019 in type B and C hospitals and health centers located in Makassar City, South Sulawesi, Indonesia. The study population comprised all DM patients who underwent treatment at the study centers. The optimum sample size was determined to be 389 respondents. In this study, the consecutive sampling technique was used where sequential selection of samples, based on the inclusion criteria, is carried out until the sample size is met or the duration of the study is over (Nursalam. 2016).

The inclusion criteria were as follows: patients with newly diagnosed type 2 DM (<6 months starting from the onset of symptoms till diagnosis), patients who are having type 2 DM for a long period (>6 months from the onset of symptoms till diagnosis) and patients who experience complications as well as those who do not experience complications of type 2 DM. The independent variable in this study was the locus of control (internal and external both), while the dependent variable was the quality of life of the patients. The data were analyzed by using univariate and bivariate analyses as well as the chi-square test. Univariate analysis was performed on the research variables to know the percentage frequency distribution and bivariate analysis was carried out to appreciate the relationship between existing variables.

## RESULT AND DISCUSSION

This study included 389 respondents. The instrument used was a questionnaire in the form of a checklist that was tailored to include the specific objectives of the research. The results of data analysis are presented in the form of descriptive tables.

**Table 1.** Frequency Distribution of Respondents (n=389)

Category	Frequency (n)	Percentage (%)
<b>Gender</b>		
Male	147	37.8
Female	242	62.2
<b>Locus of Control</b>		
Internal	177	45.5
Moderate	59	15.2
External	153	39.3
<b>Blood Sugar Levels</b>		
Good (110-145 mg/dL)	37	9.5
Middle (146-179 mg/dL)	22	5.7
Bad (>180 mg/dL)	330	84.8
<b>Quality of Life</b>		

Less	166	42.7
Good	223	57.3
<b>Total</b>	<b>3890</b>	<b>100.0</b>

Table 1 shows the characteristics of respondents including their gender, locus of control and quality of life. The frequency distribution shows that most respondents were females (62.2%), had an internal

locus of control of 45.5%, had poor blood levels with an average of >180 mg/dL as much as 84.8% and had a good quality of life (57.3%).

**Table 2.** Distribution of Locus of Control in Type 2 Diabetes Mellitus Patients on the basis of Gender

Gender	Locus of Control						Total	
	Internal		Moderate		External		n	%
	n	%	n	%	n	%		
Male	68	17.5	22	5.7	57	14.7	<b>147</b>	<b>37.8</b>
Female	109	28.0	37	9.5	96	24.7	<b>242</b>	<b>62.2</b>
<b>Total</b>	<b>177</b>	<b>45.5</b>	<b>59</b>	<b>15.2</b>	<b>153</b>	<b>39.3</b>	<b>389</b>	<b>100.0</b>

Table 2 depicts that the internal locus of control was more dominant than the external locus of control in both, males and females.

**Table 3.** The Relationship between the Locus of Control and Quality of Life in Type 2 Diabetes Mellitus Patients

Locus of Control	Quality of Life				Total		p-value
	Not good		Good		n	%	
	n	%	n	%			
Internal	56	14.4	121	31.1	177	45.5	p<0.01; $\alpha=0.05$
Moderate	32	8.2	27	6.9	59	15.2	
External	78	20.1	75	19.3	153	39.3	
Total	166	42.7	223	57.3	389	100.0	

The data from table 3 reveal that 31.1% of patients with type 2 DM having a more dominant internal locus of control had a good quality of life, while 20.1% of patients with type 2 DM with a more dominant external locus of control had a poor quality of life. The test results revealed that the locus of control had a significant influence on the quality of life of type 2 DM patients.

The locus of control acts as a control center that plays a role in controlling DM both internally and externally. The individuals who have a more dominant internal locus of control believe that they are responsible for the results obtained in controlling DM as it depend on the amount of effort made, while individuals who have a more dominant external locus of control feel irresponsible for the results obtained in the control of DM (Rotter, J.B. 1966). Wallston (1981) said that individuals who have a more dominant internal locus of control tend to reflect positive behavior in improving health.

This study shows that locus of control has a significant relationship with the quality of life of DM patients. These results can be influenced by the tendency of not being confident; those who do not have confidence in themselves do not try to change or control their health status and simply surrender to the conditions experienced, only believing that the health problems they suffer are destiny. This result is in assent

with that obtained in the study by Purwani (2015), who noted a significant influence of the locus of control, social support and Islamic religion on the quality of life of patients with type 2 DM. Thus, the better the health locus of control possessed by patients with type 2 DM, the higher is their quality of life.

The external locus of control that people with DM tend to have can be influenced by several factors including culture. While culture is one of the factors that influence locus of control, the western culture is more likely to have an internal locus of control and eastern culture is more likely to have an external locus of control (Rothbaum, F. et al 1982). The study by Nurlatifah (2018) reports that individuals with low socioeconomic status tend to develop an external locus of control for their health.

The existence of locus of control that is central to controlling the disease has the ability to improve the quality of life of these patients. Quality of life is intended as an effort owned by individuals in conducting an assessment of health. According to Skevington, Lotfy, and O'Connell (2004), quality of life is an individual's perception of existence in his life, both in the context of culture and value system, the various aspects of physical, psychological, personal beliefs and social relations, and the way in which they interact with their environment. Patients with type 2

DM having high blood sugar levels really need efficient control in order to achieve a good quality of life.

This study also shows that high blood sugar levels of the patients can be caused by several factors including the lack of effort to control the condition. The reason for this may be the fact that a patient is more dominant to have an external locus of control so that they feel that they do not have a responsibility in controlling the disease, which in turn impacts the quality of life of the patient. These results are in assent with the research conducted by Amir, Wungouw, and Pangemanan (2015), who established that high blood sugar levels in patients with type 2 DM may be responsible for the poor condition of the patient and therefore the blood glucose levels must be checked regularly and appropriate controls that help reduce the increase in glucose levels must be implemented.

Our results are also in assent with the study by Chaidir, Wahyuni, and Furkhani (2017), who concluded that an increase in blood sugar levels can be prevented by practicing self-care which comprises the four pillars of controlling DM. These results indicate that self-care has a relationship with the quality of life of these patients. Thus, the better the self-care practiced by patients, the better is their quality of life.

The quality of life of an individual is highly dependent on the environment surrounding them. This was explained in a study by Tamara, Nauli, and Bayhakki (2014) who confirmed that the relationship between family and quality of life of patients with type 2 DM is very important as the family can help these patients boost up their confidence on the area of self-care ability. The results of the present study also show that the locus of control may form the basis for predicting the quality of life of an individual; it is important for individuals to balance the locus of control, both internal and external, possessed by them so that they can acquire a good quality of life.

## CONCLUSION

It can be concluded from this study that the locus of control has a significant effect on the quality of life of patients with type 2 DM. The individuals with type 2 DM possessing a more dominant external locus of control have a quality of life that is not good because such people are very dependent on the surrounding environment and not on themselves. The results of study also indicate that locus of control may be regarded as the basis for predicting an individual's quality of life. It is thus anticipated that in order to accomplish a good quality of life for the patients with DM, it is important for them to begin control behaviors by controlling glucose levels based on the awareness themselves. Also, the existence of environmental conditions that support the patients in carrying out this control must be favorable.

## List of Abbreviations

- DM : Diabetes Mellitus
- CDC : Centers for Disease Control and Prevention

## Declarations

### Ethics approval and consent to participate

The study research protocol obtained the ethical approval of the Health Research Ethics Committee Nani Hasanuddin Helath Science Institute with Description of Ethical Approval No. 001/STIKES-NH/KEPK/X/2019. All procedures applied in the research study were in accordance with the Declaration of Helsinki. All study participants provided written informed consent.

### Consent to Publish

Not applicable.

### Availability of data and materials

Not applicable.

### Competing interests

There have no competing interests.

### Funding

None.

### Authors Contributions

YH, SS, SA and EK analyzed and interpreted the data. All of authors were equal contributors in writing the manuscript, designed and drafted the manuscript. All of authors read and approved the final manuscript.

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