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ANALYSIS OF AFFECTING FACTORS TO THE OF QUALITY LIFE PATIENTS WITH TYPE 2 DIABETES MELLITUS AT HOSPITAL IN MAKASSAR

Novaldi Hadju[1], Muhammad Syafar[2], Eha Sumantri[3]
[1]Program Pascasarjana Sekolah Tinggi Ilmu Kesehatan (STIK) Tamalatea Makassar
[2]Promosi Kesehatan dan Ilmu Perilaku, Fakultas Kesehatan Masyarakat Universitas Hasanuddin Makassar
[3]Departemen Gizi, Sekolah Tinggi Ilmu Kesehatan (STIK) Tamalatea Makassar

Correspondence Author: Novaldi Hadju, novaldihadju7@gmail.com

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ABSTRACT

Background: Diabetes mellitus is a chronic disease that cannot be completely cured and is one of the factors that affecting the quality of life of patients. The prevalence of diabetes mellitus from the 2018 Riskesdas results increased to 2%, in South Sulawesi 1.6%, Makassar 2.5%. The purpose of research was to analyze the factors affecting quality of life of patients with type 2 diabetes mellitus at hospital in Makassar. **Methods**. This type of research used is descriptive analytic with cross-sectional approach with a sample of 54 patients. The sampling technique is accidental sampling. Collecting data by interview with a questionnaire from diabetes quality of life revised version (DQoL) and analyzed based on the chi-square test and multiple logistic regression test. **Results**. Of the 54 patients, 70.4% had a high quality of life and 29.6% had a low quality of life. There was a significant effect between knowledge variables (0.040), duration of diabetes (0.043), and gangrene (0.001). Gangrene variable has the most influence on the quality of life of patients with type 2 diabetes mellitus (multivariate analysis results = 0.005). **Conclusions.** Knowledge, duration of diabetes, and gangrene have an affecting on the quality of life of patients with type 2 diabetes mellitus in RSUD Labuang Baji Makassar. Suggested for health workers to improve socialization and education to patients about the illness involving the patient's family

Correspondence Author: Novaldi Hadju, novaldihadju7@gmail.com
Program Pascasarjana Sekolah Tinggi Ilmu Kesehatan (STIK) Tamalatea Makassar

INTRODUCTION

High blood sugar (glucose) levels, exceeding the normal range, are indicative of diabetes mellitus. Various bodily disturbances result from glucose accumulating in the bloodstream due to insufficient absorption by body cells. If diabetes is not managed properly, it can lead to complications that may pose a threat to one's life. Glucose is essential for the body as an energy source. To regulate blood sugar levels, the pancreas, located behind the stomach, produces the hormone insulin.

In individuals with diabetes mellitus, the pancreas is unable to produce insulin in the quantity required by the body. Without the assistance of insulin, the cells in the body are incapable of processing and absorbing glucose. The number of diabetes cases and its prevalence has been steadily increasing over the past few decades. According to data, the global population of individuals with diabetes mellitus exceeds 200 million people. By the year 2025, this number is projected to rise to 380 million individuals with diabetes.

In 2004, the World Health Organization (WHO) reported that the incidence of non-communicable diseases reached 48.3%, as compared to the incidence of communicable diseases, which was at 47.5%. The leading cause of death worldwide is non-communicable diseases, with an incidence rate of 63.5%. Several countries that are members of the 2030 Sustainable Development Goals (SDGs) aspire to reduce the mortality rate from non-communicable diseases to one-third, aiming to achieve Universal Health Coverage (UHC) and ensure affordable essential medicines by the year 2030 (Cataloguing WL, 2016).

There were more than 422 million diabetes patients in 2014, compared to 108 million in 1980. This illustrates the increasing risk factors such as obesity. In recent years, the prevalence of diabetes has been increasing more rapidly in low- and middle-income countries compared to high-income countries. In 2012, 1.5 million deaths were attributed to diabetes mellitus, and 2.2 million deaths were caused by elevated blood sugar levels beyond the normal range, which can increase the risk of cardiovascular and other diseases. Deaths under the age of 70 accounted for 43% of 3.7 million. This phenomenon is prevalent in low- and middle-income countries (Cataloguing WL, 2016).

The number of diabetes mellitus patients aged 15 and above has seen an increase to 2% in 2018. The lowest rates are found in the East Nusa Tenggara Province at 0.9%, while the highest rates are observed in the Jakarta Special Capital Region (DKI Jakarta) at 3.4% (Kemenkes RI, 2018). Prevalence of diabetes mellitus was categorized based on age into two groups: 55 to 64 years and 65 to 74 years. According to gender, the prevalence rate for females was 1.8%, while for males, it stood at 1.2%. Furthermore, concerning the urban-rural divide, urban areas had a prevalence rate of 1.9%, whereas rural areas had a lower rate of 1.0% (Kemenkes RI, 2018).

Based on educational levels, diploma graduates had the highest prevalence, as reported by Riskedas in 2018. As for occupations, civil servants, police, and military personnel experienced the highest incidence of diabetes. To aid in the early detection of diabetes mellitus, the Ministry of Health implemented around 13,500 Posbindu (integrated health posts) as a solution, aiming to make it easier for the public to undergo early screening for this disease (Kemenkes RI, 2018).

In South Sulawesi in 2018, according to data from Riskedas, the prevalence of diabetes reached 1.6%. Based on a doctor's diagnosis, it was 2.8% in the Pinrang region, 2.5% in the city of Makassar, 2.3% in the North Toraja region, and 2.1% in the Palopo region. When assessed based on symptoms, it was 6.1% in the Toraja region, 5.3% in the city of Makassar, 5.2% in Luwu, and 4.0% in the North Luwu region. The symptoms of diabetes tend to increase with age but decrease at the age of 65. Diabetes is less prevalent in males compared to females. There are fewer diabetes patients in rural areas compared to urban areas.3
In the 2018 surveillance data, there were 27,252 cases of diabetes that received standard care at 46 primary health centers (Dinkes Kota Makassar, 2019).

The risk of complications in diabetic patients arises because the disease is not well managed, leading to insulin hormone deficiency. Complications that typically occur include rapid or long-term increases in blood sugar levels (Chaidir et al., (2017). Complications are the cause of a decrease in the Average Life Expectancy (ALE), a decrease in the quality of life, and an increase in the level of morbidity. Quality of life is assessed

by how satisfied one is with their life, experiencing happiness and contentment. There are many factors that can influence quality of life, including specific needs for diabetes patients, symptoms resulting from blood sugar instability, sexual dysfunction, and even other complications arising from diabetes. Changes in lifestyle can prevent these issues if carried out correctly. Therefore, they can help prevent the emergence of complications and enhance the quality of life (Chaidir et al., (2017).

Inability to care for oneself is the most significant factor affecting the quality of life for diabetes patients. This incapacity has an impact on the quality of life in physical, psychological, social, and environmental aspects. Self-care primarily focuses on blood sugar control and preventing complications. If self-care is conducted correctly, it will result in an improvement in the quality of life for diabetes patients (Chaidir et al., (2017). Based on previous study that age, gender, education, economic status, marital status, duration, and complications can be primary factors for the decline in the quality of life of diabetes mellitus patients (Ningtyas et al.,2013). In addition to these factors, a long duration of diabetes will increase the risk of complications, leading to a decrease in the quality of life due to suffering and mortality, ultimately resulting in a reduction in life expectancy (Ningtyas et al.,2013).

Data from the first quarter of 2019 indicates that the number of type 2 diabetes mellitus patients at Labuang Baji Regional General Hospital amounted to 213 patients, ranging from 25 to 70 years of age. It is noteworthy that more than 10 new patients are diagnosed with type 2 diabetes mellitus every month. By providing information that helps patients understand the risk factors for complications in diabetes mellitus, it is hoped that this can serve as a guide for diabetes patients to prevent complications and mortality. With numerous factors affecting the quality of life of type 2 diabetes mellitus patients, theresearcher was prompted to conduct a study on knowledge, diabetes duration, and gangrene as factors influencing the quality of life in type 2 diabetes patients. Labuang Baji Hospital was selected as the research site because it is one of the referral hospitals in the South Sulawesi Province. The purpose of research was to analyze the factors affecting quality of life of patients with type 2 diabetes mellitus at hospital in Makassar.

METHODS

This research is an observational analytic with a cross-sectional design, where all the variables under investigation were measured simultaneously during the course of the study. The subjects of this study were type 2 diabetes mellitus patients in the year 2019. The population of research comprised type 2 diabetes mellitus patients at Labuang Baji Regional General Hospital, Makassar, during the first quarter of 2019, totaling 213 patients.

The sample size for this research consisted of 54 type 2 diabetes mellitus patients at Labuang Baji Regional General Hospital in Makassar, selected using an accidental sampling technique. The instruments used in the study included a 13-item questionnaire from the Diabetes Quality of Life Revised Version (DQoL) in the domains of satisfaction, impact, and worry, as well as a 16-item questionnaire for assessing knowledge (Bujang et al.,2018; Wati et al., 2019). The analysis technique used involved univariate statistical tests using SPSS 21 to examine frequency distributions. Bivariate analysis was conducted to determine the relationship between dependent and independent variables in the form of cross-tabulation (crosstab) and chi-square statistical tests at a significance level (α) of 0.05. Multivariate analysis utilized multiple logistic regression tests to identify the most influential variables.

RESULTS

These characteristics include age, education, occupation, marital status, and the type of treatment they are receiving. Patients with a high quality of life are satisfied with their current treatment and have low levels of worry about the disease. On the other hand, patients with a low quality of life are dissatisfied with their treatment and have high levels of worry about the disease. The distribution of patients based on the characteristics of type 2 diabetes mellitus patients is as follows:

Table 1. Distribution of Patient Characteristics

Variables	Frequency (n)	Percentage (%)
Age Group (years)		
- 40-49	7	13
- 50-59	19	35.2
- 60-69	22	40.7
- >70	6	11.1
Gender		
- Males	21	38.9
- Female	33	61.1
Occupation		
- employed	23	42.6
- unenployed	31	57.4
Education		
- Elementary School	03	5.6
- Junior High School	12	22.2
- Senior High School	32	59.3
- Higher Education	07	13
Marital Status		
- Married	07	13
- Divorced	47	87
Treatment Type		
- Medical	7	13
- Combination of Medical and Traditional	47	87

Based on the age group, it is depicted that the age group 40-49 years constitutes 13.0%, the age group 50-59 years makes up 35.2%, the age group 60-69 years represents 40.7%, and those above 70 years comprise 11.1% of the total. In terms of gender, males constitute 38.9%, while females make up 61.1% of the total. Regarding occupation, the majority of patients who are not employed account for 31 patients (57.4%), whereas the lowest number is among patients who are employed, totaling 23 patients (42.6%).

Based on education, the highest number of patients have completed senior high school (SMA), with 32 patients (59.3%), while the lowest education level is primary school (SD), with only 3 patients (5.6%). Regarding marital status, the majority of patients are married, with 37 patients (68.5%), and the lowest number is among divorced patients, totaling 17 patients (31.5%).

Based on the type of treatment, the majority of patients are receiving a combination of medical and traditional treatments, totaling 47 patients (87.0%). The lowest number of patients are those receiving only medical treatment without any other alternative treatment, which amounts to 7 patients (13.0%).

Table 2. Distribution of Patient Knowledge, Diabetes Duration, Gangrene

Variables	Frequency (n)	Percentage (%)
Knowledge		
- Adequat	41	75.9
- Insufficient	13	24.1
-		
Diabetes Duration		
- < 5 years	39	72.9
- ≥5 5ears	15	27.8
Occupation		
- employed	23	42.6
- unenployed	31	57.4
Gangrene		
- None	35	64.8
- Present	19	35.2

Based on Table 2, that the results of the univariate analysis related to knowledge indicate that patients with an adequate level of knowledge make up 75.9%, while those with insufficient knowledge account for 24.1%. The results of univariate analysis related to diabetes duration show that patients with a diabetes duration of less than 5 years constitute 72.2%, while those with a diabetes duration of 5 years or more make up 27.8%. The results of univariate analysis related to gangrene indicate that patients who do not have gangrene account for 64.8%, while those who have gangrene make up 35.2%.

Table 3. Chi-Square Test Distribution for the Variable Knowledge

Knowledge	**Quality of Life**						**P Value**
	High		**Low**		**Total**		
	n	**%**	**n**	**%**	**n**	**%**	
- Adequate	32	78	09	22	41	100	0,040
- Insufficient	06	46.2	07	53.8	13	100	
Amount	38	70.4	16	29.6	54	100	

Based on Table 5, it is shown that 70.4% of the patients have a high quality of life, while 29.6% have a low quality of life. Among the patients with a high quality of life, 78.0% have an adequate level of knowledge, and 46.2% have insufficient knowledge. On the other hand, among patients with a low quality of life, 22.0% have an adequate level of knowledge, and 53.8% have insufficient knowledge.

Table 4. Chi-Square Test Distribution for the Variable Diabetes Duration

Diabetes Duration	Quality of Life						p value
	High		Low		Total		
	n	%	n	%	n	%	
- <5 years	31	79.5	08	20.5	39	100	0,043
- ≥5 years	07	46.7	08	53.3	15	100	
Amount	38	70.4	16	29.6	54	100	

Based on Table 6, it is shown that 70.4% of the patients have a high quality of life, while 29.6% have a low quality of life. Among the patients with a high quality of life, 79.5% have had diabetes for less than 5 years, and 46.7% have had diabetes for 5 years or more. On the other hand, among patients with a low quality of life, 20.5% have had diabetes for less than 5 years, and 53.3% have had diabetes for 5 years or more. Based on the analysis, the Fisher's Exact Test yielded a p-value of 0.043, which is less than the significance level (α) of 0.05. This indicates that there is an influence of diabetes duration on the quality of life of type 2 diabetes mellitus patients.

Table 5. Chi-Square Test Distribution for the Variable Gangrene

Gangrene	Quality of Life						p value
	High		Low		Total		
	n	%	n	%	n	%	
- None	30	85,7	05	14,3	35	100	0,001
- Present	08	42,1	11	57,9	19	100	
Amount	38	70,4	16	29,6	54	100	

Based on Table 7, it is shown that 70.4% of the patients have a high quality of life, while 29.6% have a low quality of life. Among the patients with a high quality of life, 85.7% do not have gangrene, and 42.1% have gangrene. On the other hand, among patients with a low quality of life, 14.3% do not have gangrene, and 57.9% have gangrene. Based on the analysis, the Fisher's Exact Test yielded a p-value of 0.001, which is less than the significance level (α) of 0.05. This indicates that there is an influence of gangrene on the quality of life of type 2 diabetes mellitus patients.

Table 6. Multiple Logistic Regression Analysis: Variables in the Equation

Variables	B	p value	95% C.I.for EXP (B)
Diabetes Duration	-.866	.403	0.052-3.295
Gangrene	-1.947	.005	0.037-0.577
Knowledge	-5.517	.642	0.067-5.279
Constant	1.203	.103	

The table "Variables in the Equation" is the main table resulting from the data analysis using logistic regression. Based on this table, the values are as follows: Constant (B0) = 1.203, the logistic regression coefficient for the independent variable Diabetes Duration (B1) = -0.886, for Gangrene (B2) = -1.947, and for Knowledge (B = -0.517). The p-values for each independent variable are as follows: Diabetes Duration = 0.403, Gangrene = 0.005, and Knowledge = 0.642. Considering the p-values, only the Gangrene variable has a p-value less than 0.05. This indicates that the Gangrene variable has the most significant influence on the quality of life of type 2 diabetes mellitus patients.

DISCUSSION

This study reveals that among type 2 diabetes mellitus patients at Labuang Baji Regional General Hospital, 41 patients have adequate knowledge, while 13 patients have insufficient knowledge. The statistical test results show a p-value of 0.040, indicating an influence of knowledge on the quality of life of type 2 diabetes mellitus patients.

This aligns with previous research, which suggests that the majority of type 2 diabetes mellitus patients with a high quality of life possess sufficient knowledge about their condition, enabling them to accept and manage their disease effectively. In this study, the proportion of type 2 diabetes mellitus patients with adequate knowledge about diabetes is 75.9%, while 24.1% have insufficient knowledge about diabetes. This is in line with research cited from the Andalas

Medical Journal, which states that patients' knowledge levels about diabetes are a tool that can assist patients in managing diabetes throughout their lives. Patient behavior based on knowledge and a positive attitude will be more successful. The knowledge provided to diabetes patients will make them understand the disease they have and how to modify their behavior to cope with it. Diabetes is a lifelong condition, and the role of healthcare professionals in primary healthcare is crucial. Managing this disease requires the involvement of various healthcare providers. Patients and their families have the right to receive knowledge about the course of the disease, prevention, barriers, and diabetes therapy (Nazriati et al., 2018).

The multivariate analysis of the knowledge variable, which is not significant, suggests that there is no significant difference between having sufficient or insufficient knowledge when patients are not compliant. This is in line with previous research indicating that patient compliance in diabetes care is generally defined as the level of individual behavior in following therapy to regulate dietary patterns, medication, and adhering to a lifestyle in accordance with the recommendations of healthcare providers. Patients who do not understand diabetes are less likely to be compliant with their diabetes treatment. The success of diabetes treatment is closely related to patient compliance with medication. Previous studies on the relationship between knowledge and medication adherence have shown varying results (Nazriati et al., 2018). As we know, the better we understand the disease we are suffering from, the better our level of disease management.

In this study, it was showed that patients with type 2 diabetes mellitus at RSUD Labuang Baji who have had diabetes for less than 5 years are 39 in number, and those with a duration of 5 years or more are 15 in number. The statistical test results show a p-value of 0.043, indicating an influence of diabetes duration on the quality of life of type 2 diabetes mellitus patients.

This is consistent with previous research that has suggested that an increase in the duration of the disease is associated with a decrease in quality of life. The longer a person suffers from the disease, the more their quality of life tends to decrease due to changes in daily activities. In this study, the proportion of patients with a diabetes duration of less than 5 years is 72.2%, while those with a duration of 5 years or more account for 27.8%. Several studies have found that an increase in the duration of diabetes is linked to a decline in the quality of life, as assessed by the Nottingham Health Profile in Finland among people with various types of diabetes.

On the other hand, some studies have not found a significant relationship between quality of life and disease duration. The multivariate analysis results for the diabetes duration variable were not significant. Several reports have shown no significant relationship between disease duration and depression in type 1 and type 2 diabetes mellitus patients. A study in the United Kingdom found that DQOL (Diabetes Quality of Life) treatment satisfaction scores were actually higher for those who had been suffering from diabetes for a longer duration.

Longer diabetes duration is closely related to the quality of life of type 2 diabetes mellitus patients. Typically, low quality of life is associated with a longer duration of diabetes. The duration of diabetes is related to the level of anxiety, which in turn affects the decrease in the quality of life of type 2 diabetes mellitus patients. However, with positive adaptation from diabetes patients, the duration of diabetes may not have a very significant impact on their quality of life. This positive adaptation behavior is centered on coping processes, which are task-oriented and self-protective processes. Patients with a longer duration of diabetes can adapt to their environment if they can manage their emotional reactions and provide self-defense against anxiety and stress. The ego defense mechanism indirectly serves as a defense against stress. This is why diabetes patients can endure the long duration of their suffering while maintaining a good quality of life.

In this study, it was showed that patients with type 2 diabetes mellitus at RSUD Labuang Baji who have gangrene wounds amounted to 19 patients, while those without gangrene wounds were 35 patients. The statistical test results show a p-value of 0.001, indicating that gangrene has an impact on the quality of life of type 2 diabetes mellitus patients. This is consistent with previous research that has associated diabetic wounds or gangrene with a decrease in the quality of life. The presence of gangrene wounds can disrupt the physical health dimension of patients, and the longer a patient suffers from gangrene, the more their quality of life will be affected due to changes in daily activities. In this study, the proportion of patients with gangrene is 35.2%, while those without gangrene make up 64.8% of the sample.

Gangrene wounds can significantly reduce the quality of life for diabetic patients with these

wounds. This is because diabetic wounds often persist for extended periods and are difficult to heal, which can negatively impact their quality of life. Consequently, it affects the treatment and therapy processes that they are currently undergoing (Yohana, 2018). Based on previous studies, it shows that diabetic ulcers with the characteristics of Meggitt Wagner grade 1 ulcer criteria are dominated by women in Banda Aceh hospitals (Eka et al., 2017).

Based on previous studies at the Royal Prima Hospital, it was found that the proportion of diabetic gangrene sufferers in type 2 diabetes mellitus patients was highest in aged 51-60 years (54.4%), while the lowest proportion was aged <40 years (3.5%) .The results of the multivariate analysis for the variable gangrene are significant, meaning that gangrene is the variable that most significantly affects the quality of life for patients with type 2 diabetes mellitus. Therefore, family support can make patients with gangrene feel loved, valued, and still needed by their family members.

RESEARCH LIMITATIONS

The limitations in sample of this research, it was minimized respondents.

CONCLUSION

Based on the research findings, it can be concluded that there is an influence of knowledge, duration of diabetes, and gangrene on the quality of life of patients with type 2 diabetes mellitus. The variable that has the most significant impact on quality of life is gangrene.

It is recommended that healthcare professionals collaborate with the families of patients to improve their quality of life by increasing their understanding of the disease. Family members also play a crucial role in managing family members with diabetes. In terms of detection, the family's role is to recognize the symptoms and signs of diabetes to expedite treatment and prevent complications.

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