Support of Characteristics, Physical Environmental and Psychological On Quality Of Life Of Patients With DM Type II

Fivit Febriani Malik[1,*], Ridwan Amiruddin[1], Wahiduddin[1], Ida Leida Maria[1], Nurzakiah Hasan[2], Fridawaty Rivai[3] and Haerani[4]

[1]*Department of Epidemiology, Faculty of Public Health, Hasanuddin University, Makassar, Indonesia*

[2]*Department of Nutrition Science, Faculty of Public Health, Hasanuddin University, Makassar, Indonesia*

[3]*Department of Hospital Management, Faculty of Public Health, Hasanuddin University, Makassar, Indonesia*

[4]*Department of Environmental Health, Makassar Health Polytechnic, Makassar, Indonesia*

Abstract: *Background*: Diabetes mellitus is one of the diseases that ranks high in the list of non-communicable diseases in Indonesia. Factors that can affect quality of life such as physical environment and psychological.

Objective: This study aims to examine the relationship between characteristic, physical environment and psychological on quality of life of type II diabetes mellitus patients at the Barombong Public Health Center, Makkasar City.

Methodology: This study is a quantitative research with an analytical observational approach using a cross-sectional design. The population size in this study is 578 individuals, sample calculation using the WHO formula yielded a sample size of 385 individuals with predefined exclusion an inclusion criteria. The sampling technique employed is simple random sampling (SRS), and the hypothesis test used is chi-square.

Results: Bivariate statistical analysis shows that there is a relationship between quality of life and age (p=0,000), duration of illness (p=0,000), temperature (p=0,000), noise (p=0,000), positive feelings (p=0,000), thinking, learning, and concentration (p=0,000), self-esteem (p=0,000), while variables that are not associated with quality of life are gender (p=0,111), marital status (p=0,228) and social support (p=0,645). Based on logistic regression analysis, it was found that the factors that most influence quality of life are duration of illness (p=0,000) and positive feelings (p=0,000).

Conclusion: Length of suffering and positive feelings are the most dominant variables associated with quality of life with a probability level of 99.8%.

Keywords: Characteristics, Physical Environmental, Physicological, Quality of Life, Diabetes mellitus type II.

INTRODUCTION

Diabetes mellitus is a long-term disease that begins with insulin resistance and prediabetes. Diabetes mellitus is a chronic disease caused by the inability of the pancreas to produce the hormone insulin (a hormone that regulates blood sugar levels) or the inability of the body to use insulin efficiently, leading to the elevated blood sugar levels (hyperglycemia) that are characteristic of diabetes mellitus. Diabetes mellitus is a heterogeneous metabolic disorder that occurs when blood glucose levels rise due to insufficient insulin production [1]. The definition of controlled DM is when blood glucose levels, lipid levels and HbA1c reach expected levels [2].

Worldwide, there are 422 million people with diabetes, most of whom live in low- and middle-income countries, and diabetes causes 1.5 million deaths each year. Over the past few decades, the number of cases and prevalence of diabetes has increased rapidly, with the average prevalence increasing from 4.7% in the adult population to 8.5 percent. This increase reflects an increase in risk factors such as overweight or obesity. Over the past decade, the prevalence of diabetes has increased faster in low- and middle-income countries than in high-income countries [3].

Indonesia is the only country in Southeast Asia listed for diabetes mellitus, so it ranks third with a prevalence of 11.3%. Thus, Indonesia's contribution to the prevalence of diabetes mellitus in Southeast Asia is estimated to be substantial [4].

Based on data from South Sulawesi Province, Makassar City ranks first for the highest number of people with diabetes mellitus out of 21 districts and 3 cities in 2022 with 24,739 people with diabetes mellitus. Data from the Makassar City Health Office for the Non-Communicable Disease (NCD) category, diabetes mellitus ranks 2nd in the 10 highest diseases after hypertension. The Makassar City Health Office has a working area of 47 Puskesmas and one of the puskesmas areas located in the peripheral area is the Barombong Puskesmas which has a working area of 13 RW and 67 RT located in the coastal area of Makassar City [5]. Cases of diabetes mellitus at Barombong Health Center in 2022 were 324 cases and increased in 2023 with 578 cases [6].

The World Health Organization (WHO) developed quality of life evaluations for a variety of reasons, including an expanded focus on measuring well-being beyond health parameters such as mortality and

*Address correspondence to this author at the Department of Epidemiology, Faculty of Public Health, Hasanuddin University, Makassar, Indonesia;
E-mail: f.fivit2227@gmail.com

disease severity. The WHO categorizes the quality of life evaluation into 4 domains, including domain I, physical health, domain II, psychological, domain III, social interaction, and domain IV, environment. Environment measures how individuals interpret their environmental conditions, including weather, noise, and pollution. These aspects of the environment definitely affect one's quality of life [7].

The characteristics, physical environment, and psychological support model is emphasized in this study because diabetes is not only about blood sugar control, but also involves characteristics and factors of the physical environment, as well as psychological aspects that affect patients' accessibility to health services and their ability to manage the disease.

METHODOLOGY

Research Design

This study is a quantitative research with an analytical observational approach using a *cross-sectional* design. The dependent variable in this study is the quality of life of patients with type II diabetes mellitus. The independent variables in this study are characteristics, physical environment and psychological. The sampling technique employed is *simple random sampling* (SRS). Physical environment measurements used temperature and noise measuring devices, for quality of life measurements by direct interviews and using the 5Q5D-5L questionnaire, and psychological variables were measured using the Diabetes Distress Scale questionnaire.

Research Sites

This research was carried out at the Barombong Community Health Center, Makassar City in 2024. The working area of the Barombong Community Health Center can be seen in the picture below:

Study Sample

The population in this study was 578 people in 2023, the sample calculation used the WHO formula with a cross sectional study, which is as follows:

$$n = \frac{Z^2 \, x \, p \, x \, (1-p)}{E^2}$$

Description :

n : Desired sample size

Z : Z value for certain level of confidence (95%)

p : Estimated proportion in the population

E : Desired margin of error

$$n = \frac{(1.96)^2 x \; 0.5 \; x \; (1-0.5)}{(0.05)^2}$$

$$n = \frac{3.8416 \; x \; 0.25}{0.0025}$$

$$n = \frac{0.9604}{0.0025}$$

n = 384.16

Thus, the desired (least) sample size for a population of 578 with a margin of error of 0.05) and

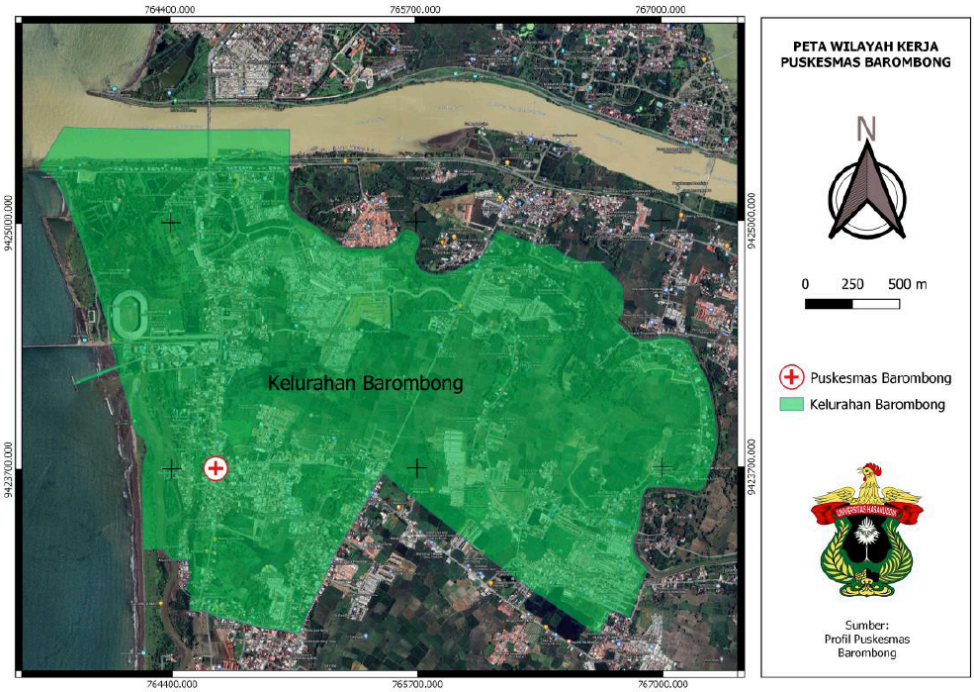

Figure 1: Map of Barombong Community Health Center Working Area Boundaries.

95% confidence level is approximately 385. Numbers rounded up to get a more conservative sample.

Data Analysis

Data were processed using Stata version 14 program. The association between dependent and independent variables were analysed with the chi-square test. The multivariate analysis used was the logistic regression test with a confidence level of 95% (α = 0.05).

Ethical Approval

This study was approved by the Health Research Ethics Committee of Hasanuddin University with a recommendation for ethical approval number 480/UN4.14.1/TP.01.02/2024 dated 19 February 2024.

RESULTS

Table **1** shows that of the 385 patients with type II diabetes mellitus, 287 were female (61,8%). The largest age group was ≥50 years as many as 287 people (74,55%). In the characteristics of marital status, the most married status was 380 people (98,70%). The characteristics of the longest suffering are ≥5 years as many as 252 people (65.5%). The quality of life of most people with diabetes mellitus is having a good quality of life with a total of 252 people (65.45%). In the physical environment variable, the most sufferers for

Table 1: Univariate Analysis of Characteristics, Physical, and Psychological Environment of Patients with Type II Diabetes Mellitus at Barombong Health Centre in Makassar City In 2024

Respondent Characteristics	Frequency (n)	Percentage (%)
Gender		
Male	147	38,18
Female	238	61,82
Age (years)		
< 50 years	98	25,45
≥ 50 years	287	74,55
Marital Status		
Get married	380	98,70
Divorce dead	5	1,30
Long Suffering (years)		
< 5 years	133	34,55
≥ 5 years	252	65,45
Quality Of Life		
Bad	133	34,55
Good	252	65,45
Temperature		
Unqualified	145	37,66
Qualified	240	62,34
Noise		
Unqualified	105	27,27
Qualified	280	72,73
Positive Feelings		
Low	195	50,65
High	190	49,35
Thinking, learning, memory and concentration		
Low	245	63,64
High	140	36,36
Self-esteem		
Low	238	61,82
High	147	38,18
Social Support		
Low	2	0,52
High	383	99,48
Total	385	100

Source: Primary Data, 2024.

the temperature category are eligible as many as 240 people (62.34%) and for the noise category, the most are eligible 280 people (72.73%). On psychological variables, the category of positive feelings has low positive feelings as many as 195 people (49.35%), thinking learning memory and concentration with the most low categories as many as 245 people (63.64%), the most self-esteem with low categories as many as 238 people (61.82%), and the most social support with high categories as many as 383 people (99.48%).

Table **2** shows that there are 7 significant variables, namely age p-value (0.000), length of suffering p-value (0.000), temperature p-value (0.000), noise p-value (0.000), positive feelings p-value (0.000), thinking, learning, memory and concentration p-value (0.000), and self-esteem p-value (0.000). There were 3 variables that were not associated with quality of life, namely gender p-value (0.111), marital status p-value (0.228), and social support p-value (0.645). There were 9 variables with a p-value <0.25, namely variables of gender, age, marital status, length of suffering, temperature, noise, positive feelings, learning, memory and concentration, and self-esteem. These variables were continued in multivariate analysis.

Table **3** shows the results of multivariate analysis using logistic regression analysis, obtained two

Table 2: Bivariate Analysis of Characteristics, Physical, and Psychological Environments on the Quality of Life of Patients with Type II Diabetes Mellitus at the Barombong Health Centre in Makassar City In 2024

Variables	Quality of Life				*p-value*
	Good		Bad		
	n	%	n	%	
Gender					
Male	89	60,54	58	39,46	0,111*
Female	163	68,49	75	31,51	
Age (years)					
< 50 years	92	93,88	6	6,12	0,000*
≥ 50 years	160	55,75	127	44,25	
Marital Status					
Get married	250	65,79	130	34,21	0,228*
Divorce dead	2	40,00	3	60,00	
Long Suffering (years)					
< 5 years	252	100,0	0	0,0	0,000*
≥ 5 years	0	0,0	133	100,0	
Temperature					
Qualified	214	89,17	26	10,83	0,000*
Unqualified	38	26,21	107	73,79	
Noise					
Qualified	243	86,79	37	13,21	0,000*
Unqualified	9	8,57	96	91,43	
Positive Feelings					
High	183	96,32	7	3,68	0,000*
Low	69	35,38	126	64,62	
Thinking, learning, memory, and concentration					
High	134	95,71	6	4,29	0,000*
Low	118	48,16	127	51,84	
Self-esteem					
High	65	58,04	91	81,25	0,000*
Low	47	41,96	21	18,75	
Social support					
High	251	65.5	132	34.4	0,645
Low	1	50,0	1	50,0	

Source: Primary Data, 2024.
*candidate variables (p<0,25) that will be continued in multivariate analysis.

Table 3: Results of Multivariate Logistic Regression Analysis of Characteristics, Physical, and Psychological Environments on the Quality of Life of Patients with Type II Diabetes Mellitus at the Barombong Health Centre, Makassar City in 2024

Variables	Coef.	S.E	z	p-value	Exp (B)	95% CI	
						LL	UL
Long suffering	7,512356	1,066768	7,04	0,000	7,512356	0,542153	9,603183
Positive Feelings	4,237187	1,108883	3,82	0,000	4,237187	2,063816	6,410557
_cons	-4,977204	1,012692	-4,91	0,000	-4,977204	-6,962045	-2,992364

Source: Primary Data, 2024.

variables with a p value <0.05, namely length of suffering p-value (0,000) with 95% CI value LL 0,542153 UL 9.603183, and positive feelings (0.000) with 95% CI value LL 2.063816 UL 6.410557. This means that both variables are associated with quality of life.

In accordance with the results of the previous analysis, the variables that affect the quality of life of patients with type II diabetes mellitus are length of suffering with positive feelings. So that the regression equation is:

$y = \text{const} + \text{coef}_{(x1)} + \text{coef}_{(x2)} + \text{coef}_{(x3)}$

$y = -4,977204+7.512356+4.237187$

$y = 6,772339$

After obtaining the y value, the next step is to calculate the probability of the subject with the formula:

$P = 1 /(1+\exp^{(-y)})$

$P = 1 /(1+\exp^{(-6,772339)})$

$P = 0,9988563$

$P = 0,9988563 \times 100\%$

$P = 99,8\%$

Thus, it can be seen that if the patient is diagnosed with type II diabetes mellitus in a relatively new period of time and has high positive feelings, the possibility of patients at Puskesmas Barombong Makassar City to have a good quality of life is 99,8%.

DISCUSSION

Gender

The results of the analysis showed that patients with type II diabetes mellitus at Puskesmas Barombong were dominated by women as many as 238 people (61,82%). The statistical test results show that there is no relationship between gender and the quality of life of patients with type II diabetes mellitus at the Barombong Health Centre, Makassar City in 2024 with p-value=0,111 (>0,05).

This is in line with research conducted by Rohmatulloh *et al*., showing the results that female patients suffering from type 2 diabetes mellitus are more, namely 53 patients (60,9%), compared to male patients suffering from diabetes mellitus, namely 34 patients (39,1%) at the Internal Medicine Clinic of Karsa Husada Hospital, Batu City [8].

The results of this study are also in line with research conducted by Krzemińska *et al*., showing that there is no relationship between gender and the quality of life of patients with type II diabetes mellitus in the Central European region [9].

The results of this study are not in line with research conducted by Chowdhury & Chakraborty, showing that there is a significant relationship between gender and quality of life of outpatients with type II diabetes mellitus in South India [10].

Age

The results of the analysis showed that based on the age group of patients with type II diabetes mellitus at Puskesmas Barombong Makassar City in 2024, the highest number was ≥50 years as many as 287 people (74,55%). The statistical test results show that there is a significant relationship between age and the quality of life of patients with type II diabetes mellitus at the Barombong Health Centre, Makassar City in 2024 with a p-value of 0,000 (<0,05).

The results of this study are also supported by similar research conducted by Islamiyah & Inayah, which shows that the frequency distribution of respondents' age shows that the most age group is age> 50 years, with 31 respondents (62%) [11].

The results of this study are not in line with research conducted by Krzemińska *et al*., 2020 showing that the results of the analysis conducted obtained a value of p=0,203 which means that there is no relationship

between age and quality of life of patients with type II diabetes mellitus in Poland, Czech Republic and Slovakia [12].

The older a person gets, the more the function of his or her organs declines. The aging process can affect hormone production in the body, so for people with diabetes mellitus (DM), maintaining a healthy lifestyle is very important to achieve optimal quality of life. One of the main goals of DM management is to ensure a good quality of life for sufferers. Quality of life in DM patients includes an individual's view of all aspects of life as a whole, including biological, mental, social, cultural, spiritual, and environmental aspects, as well as the individual's ability to function in daily life [13].

Marital Status

The results of the analysis in this study showed that the marital status of most respondents was married as many as 380 people (98.7%). The statistical test results show that there is no relationship between marital status and the quality of life of patients with type II diabetes mellitus at the Barombong Health Centre, Makassar City in 2024 with a p-value=0,228 (>0,05).

The results of this study are in line with research conducted by Aliatun & Ika showing that there is no relationship between marital status and the quality of life of patients with diabetes mellitus during the Covid-19 pandemic, according to the chisquare test, the result of the p-value=0,239 [14].

The results of this study are not in line with research conducted by Zuzetta *et al*., showing that marital status affects the quality of life of patients with type II diabetes mellitus at Puskesmas Sawah Lebar Bengkulu City [15].

Marital status has a correlation with the quality of life of patients with type II diabetes mellitus. The existence of a partner who always provides support and accompanies when the patient faces difficulties related to his health condition and needs help will increase the patient's enthusiasm in living his life [16].

Long Suffering

The results of the analysis in this study showed that based on the length of suffering the most respondents were ≥5 years as many as 252 people (65,45%). The results of statistical tests showed that there was a significant relationship between length of suffering and the quality of life of patients with type II diabetes mellitus at the Barombong Health Centre, Makassar City in 2024 with a p-value = 0,000 (<0,05).

The results of this study are in line with research conducted by Khaliza, showing that the quality of life of elderly diabetes mellitus sufferers at UPTD Puskesmas Nisam, North Aceh Regency is associated with length of suffering, according to the chi square statistical test with the results of p-value=0,002, which means that there is a relationship between length of suffering and quality of life of patients with diabetes mellitus [17].

The results of this study are not in line with research conducted by Aliatun & Ika, showing that the relationship between diabetes duration and health-related quality of life of patients with diabetes mellitus during the Covid-19 pandemic using the fisher test obtained a p-value = 0,427, meaning that there is no relationship between diabetes duration and healthrelated quality of life of diabetics during the Covid-19 pandemic [14].

A long duration of diabetes mellitus, if accompanied by a healthy lifestyle, can result in a good quality of life, which in turn can prevent or delay long-term complications. Quality of life in the elderly is strongly influenced by their health condition, with various factors affecting it, including disease duration and complications. Decreased quality of life in patients with diabetes mellitus is significantly associated with disease incidence, mortality, and can affect the patient's life expectancy [18].

Temperature

The results of the analysis of the physical environment, namely temperature in this study showed that 145 people (37,7%) did not meet the requirements and 240 people (62,3%) met the requirements. The statistical test results show that there is a significant relationship between temperature and the quality of life of type II diabetes melittus patients at the Barombong Health Centre, Makassar City in 2024 with a p-value = 0,000 (<0,05).

The results of this study are in line with research conducted by Sepriani, showing that as many as 56 respondents (70%) had bedroom temperatures that did not meet the requirements and had poor quality of life It was concluded that there was a significant relationship between temperature and quality of life of patients with diabetes mellitus with a p-value = 0,000 [19].

High ambient temperatures can affect a person's body, and everyone responds to heat differently. People with DM have thermosensitivity issues, which prevents them from properly regulating their body temperature, which can lead to illness or injury such as neuropathy. In addition, temperature can impact air quality and promote the growth of microorganisms. Due to decreased immunity, people with DM, especially type II, have impaired bronchial reactivation, which allows infections to invade the body [19].

Noise

The results of the analysis of the physical environment, namely noise in this study showed that it did not meet the requirements, namely 105 people (27,3%). and those who met the requirements were 280 people (72,7%). qualified, namely 145 people (37,7%) and those who met the requirements were 240 people (62,3%). The statistical test results show that there is a significant relationship between noise and the quality of life of type II diabetes melittus patients at the Barombong Health Centre, Makassar City in 2024 with a p-value = 0,000 (<0,05).

The results of this study are in line with research conducted by Shin *et al*., showing that there is an association between exposure to traffic noise which is associated with an increased incidence of hypertension and diabetes mellitus in Toronto, Canada [20].

Noise can not only impair hearing, but it can also disrupt the cardiovascular system, disturb sleep quality and affect blood glucose. Appearance noise increases heart rate and blood pressure. Stressful conditions, such as acute noise, can increase sympathetic nerves and increase stress hormones, such as epinephrine and norepinephrine. This condition causes vasoconstriction of blood vessels, which increases cardiac output and peripheral resistance. Exposure to noise for longer than the normal threshold and continuously can increase blood glucose levels. This may occur because noise stress suppresses cortisol, epinephrine and non-epinephrine hormones through the processes of gluconeogenesis and glycogenolysis [21].

The noise from vehicles and the presence of harmful pollutants, the close distance between the house and the highway makes the exterior and interior environment of the house poor, making residents who suffer from type II diabetes mellitus easily infected with respiratory problems, thus having a poor quality of life due to this.

Positive Feelings

The results of the analysis in this study showed that the distribution based on positive feelings showed that out of a total of 385 respondents there were 190 respondents (49,35%) with low positive feelings. Meanwhile, 195 respondents (50,65%) with high positive feelings experienced by patients with type II diabetes mellitus at the Barombong Health Centre, Makassar City in 2024. The statistical test results show that there is a significant relationship between positive feelings and the quality of life of patients with type II diabetes mellitus at the Barombong Health Centre, Makassar City in 2024 with a p-value=0,000 (<0,05).

The results of this study are supported by this study which has been conducted by Hudatul Umam *et al*., showing the results that positive feelings have a greater impact on the quality of life of people with diabetes mellitus at Puskesmas Wanaraja Garut Regency [22].

Thinking, Learning, Memory, and Concentration

The results of the analysis showed that 245 people (63,64%) had low thinking, learning, memory and concentration and 140 people (36,36%) were high. The results of statistical tests show that there is a significant relationship between thinking, learning, memory and concentration on the quality of life of patients with type II diabetes mellitus at the Barombong Health Centre, Makassar City in 2024 with a p-value = 0,000 (<0,05).

The results of this study are in line with research conducted by Amelia, showing that the domains of thinking, learning, memory and concentration get the results of 61,73%, this proves that diabetic patients at Haji Adam Malik Hospital have good thinking, learning, memory and concentration skills [23].

Self-Esteem

The results of the analysis showed that 238 people (61.82%) had low self-esteem and 147 people (38,18%) were high. The statistical test results show that there is a significant relationship between self-esteem and the quality of life of patients with type II diabetes mellitus at the Barombong Health Centre, Makassar City in 2024 with a p-value = 0,000 (<0,05).

The results of this study are in line with research conducted by Amartya Noor *et al*., showing that there is a relationship between quality of life and low self-esteem in parents in Pulo Gadung Village, East Jakarta, p-value = 0,039 [24].

The results of this study are in line with research conducted by Kumalasari & Asriyadi, showing that based on the analysis of self-esteem variables, most respondents had low self-esteem as many as 44 people (62,9%) and high self-esteem as many as 26 people (37,1%). The statistical test results obtained p-value=0,000 (<0,05) which means there is a relationship [25].

Social Support

The results of the analysis showed that as many as 2 people (0,52%) had low self-esteem and 383 people (99,48%) were high. The statistical test results show that there is no relationship between social support and the quality of life of patients with type II diabetes mellitus at the Barombong Health Centre, Makassar City in 2024 with a p-value = 0,645 (>0,05).

The results of this study are in line with research conducted by Suardana *et al*., showing that there is no relationship between family social support and quality of life of DM patients with a significance value (p) = 0,195 and a correlation coefficient value (r)= -0,209 [26].

The results of this study are not in line with research conducted by Purnomo & Abas, showing that 61 elderly people with type 2 DM at Rumah Sehat Baznas Jakarta found that 25 people (41%) had low social support and 36 people (59%) had high social support. p-value = 0,003 there is a relationship between social support and the quality of life of patients with diabetes mellitus in the elderly at Rumah Sehat Baznas Jakarta in 2019 [27].

CONCLUSION

Long suffering and positive feelings are the variables most associated with the quality of life of patients with type II diabetes mellitus at Puskesmas Barombong Makassar City in 204. It is recommended to continuously improve the quality of life of patients with type II diabetes mellitus by further optimising posbindu, posyandu elderly, and prolanis in treating the condition of patients and preventing complications in the future.

ACKNOWLEDGEMENTS

The researcher would like to thank my supervisor from the Faculty of Public Health, Hasanuddin University, the Head of the Barombong Community Health Center and his family who have provided support during the research so that this research can be carried out well.

CONFLICT OF INTEREST

We have no competing interests.

REFERENCES

[1] Amiruddin R. Epidemiologi Penyakit Tidak Menular Kualitas Keperawatan dan Kualitas Hidup Penderita Diabetes Melitus (Quality of Care & Life Diabetes Melitus (Quality of Care & Life Diabetes Mellitus). First Printing.Jakarta: Trans Info Media 2023; ISBN: 978-602-202-370-8.

[2] Wahiduddin, Pranoto A, Sudjarwo. Glycemic Control in Type 2 Diabetes Mellitus Patients with and without Pulmonary Tuberculosis. Media Kesehatan Masyarakat Indonesia 2019; 15(1): 99-109. https://doi.org/10.30597/mkmi.v15i1.5292

[3] WHO. Diabetes Mellitus 2022.

[4] Resti HY, Cahyati WH, Artikel I. Higeia Journal Of Public Health Kejadian Diabetes Melitus pada Usia Produktif di Puskesmas Kecamatan Pasar 2022; 6(3): 350-361.

[5] Makassar DKK. Profil Kesehatan Kota Makassar Tahun 2022.

[6] Makassar DKK. Profil Kesehatan Kota Makassar Tahun 2023.

[7] World Health Organization. Programme on Mental Health WHOQoL User Manual 2012. https://apps.who.int/iris/handle/10665/77932

[8] Rohmatulloh VR, Pardjianto B, Kinasih LS. Hubungan Usia Dan Jenis Kelamin Terhadap Angka Kejadian Diabetes Melitus Tipe 2 Berdasarkan 4 Kriteria Diagnosis Di Poliklinik Penyakit 2024; 8(April): 2528-2543.

[9] Krzemińska S, Bąk E, Polanská A, Hašová K, Laurinc M, Zrubcová D, Młynarska A. Does gender affect health-related quality of life in patients with type 2 diabetes (ADDQoL) in Central European countries? Annals of Agricultural and Environmental Medicine 2023; 30(2): 296-305. https://doi.org/10.26444/aaem/161584

[10] Chowdhury S, Chakraborty P. pratim. Universal health coverage. There is more to it than meets the eye. Journal of Family Medicine and Primary Care 2022; 6(2): 169-170.

[11] Islamiyah S, Inayah Z. Gambaran Kualitas Hidup Penderita Diabetes Melitus Tipe UU Di Klinik Ardhito Medika Kota Bandar Lampung. Jurnalmalahayati 2023; 10(3): 1672-1680.

[12] Krzemińska S, Bąk E, Šáteková L, Polanská A, Hašová K, Laurinc M. Comparison of diabetes-dependent quality of life (Addqol) in patients with t2dm in poland, the czech republic, and slovakia. Diabetes, Metabolic Syndrome and Obesity 2020; 13: 3773-3786. https://doi.org/10.2147/DMSO.S273339

[13] Retaningsih V, Kora FT. Peningkatan kualitas hidup pasien dm dengan menjaga kadar gula darah. Jurnal Informasi Kesehatan & Administrasi Rumah Sakit (IKARS) 2022; 1(2): 50-52. https://doi.org/10.55426/ikars.v1i2.214

[14] Aliatun ND, Ika FA. Health-Related Quality of Life Penderita Diabetes Melitus di Masa Pandemi COVID-19. Higeia Journal of Public Health Research and Development 2021; 5(4): 556-568.

[15] Zuzetta T, Pudiarifanti N, Sayuti N. Diabetes Melitus Tipe II Di Puskesmas Sawah Lebar. Jurnal Pharmacopoeia 2022; 1(2): 131-142

[16] Nisa, Hoirun PK. Kualitas Hidup Penderita Diabetes Melitus dan Faktor Determinannya 2023; 6(1). https://doi.org/10.33086/mtphj.v6i1.3438

[17] Khaliza N. Hubungan Lama Menderita Diabetes Melitus Dengan Kualitas Hidup Lansia Di Wilayah Kerja UPTD Puskesmas Nisam Kabupaten Aceh Utara 2021.

[18] Ferawati, Nurfitriani Y. Hubungan Tingkat Pengetahuan Dan Self Management Dengan Kualitas Hidup Penderita Diabetes Mellitus Pada Lansia Penderita Diabetes Mellitus Di Wilayah Kerja Pkm Tanjungharjo. Jurnal Ilmu Kesehatan MAKIA 2023; 13(1): 1-6. http://jurnal.istekicsadabjn.ac.id/index.php/jmakia/article/view/275

[19] Sepriani T. Hubungan faktor lingkungan fisik dengan kualitas hidup penderita diabetes mellitus. COMSERVA: Jurnal Penelitian Dan Pengabdian Masyarakat 2022; 2(07): 1-11. https://doi.org/10.59141/comserva.v2i7.421

[20] Shin S, Bai L, Oiamo TH, Burnett RT, Weichenthal S, Jerrett M, Kwong JC, Goldberg MS, Copes R, Kopp A, Chen H. Association between road traffic noise and incidence of diabetes mellitus and hypertension in toronto, canada: A population-based cohort study. Journal of the American Heart Association 2020; 9(6). https://doi.org/10.1161/JAHA.119.013021

[21] Rumiati F, Lailossa AL, William W, Winata SD. Hubungan Kebisingan dengan Kadar Glukosa Darah pada Manusia. Jurnal Med Scientiae 2022; 1(2): 62-72. https://doi.org/10.36452/jmedscie.v1i2.2632

[22] Hudatul Umam M, Solehati T, Purnama D. Gambaran Kualitas Hidup Pasien Dengan Diabetes Melitus Di Puskesmas Wanaraja. Jurnal Kesehatan Kusuma Husada 2020; 70-80. https://doi.org/10.34035/jk.v11i1.419

[23] Amelia R. The Correlation Between Level of Diabetic Patients Knowledge with Quality of Life in Patients with Type 2 Diabetes Mellitus at Haji Adam Malik Hospital Medan 2019; 313-318.

[24] Amartya Noor R, Harliansyah H, Widayanti E. Hubungan Kualitas Hidup Terhadap Harga Diri Lansia Selama Pandemi Covid-19. Cerdika: Jurnal Ilmiah Indonesia 2023; 3(1): 12-19. https://doi.org/10.59141/cerdika.v3i1.515

[25] Kumalasari R, Asriyadi F. Hubungan Manajemen Diri Dengan Konsep Diri Pada Pasien Diabetes Militus Di Wilayah Kerja Puskesmas Palaran Samarinda. Borneo Student Research 2020; 1(3): 1490-1495.

[26] Suardana IK, Rasdini IGAA, Kusmarjath NK. Hubungan Dukungan Sosial Keluarga Dengan Kualitas Hidup Pasien Diabetes Mellitus Tipe 2 Di Puskesmas Denpasar Selatan. Jurnal Skala Husada 2019; 12(1): 96-102. https://doi.org/10.30643/jiksht.v12i1.36

[27] Purnomo H, Abas I. Hubungan Dukungan Sosial Terhadap Kualitas Hidup Penderita Diabetes Melitus Pada Lansia Di Rumah Sehat Baznas Jakarta Tahun 2019. Afiat 2020; 6(02): 51-59. https://doi.org/10.34005/afiat.v6i02.1335

Received on 29-05-2024 Accepted on 26-06-2024 Published on 15-07-2024

https://doi.org/10.6000/1929-6029.2024.13.08