

## THE RELATIONSHIP BETWEEN FAMILY SUPPORT AND SELF-CARE MANAGEMENT AND QUALITY OF LIFE TYPE 2 DIABETES MELLITUS PATIENTS

Hamdana<sup>1</sup>, A. Nurlaela Amin<sup>2\*</sup>, Muhammad Reza Asmadi<sup>3</sup>,  
Amirullah<sup>4</sup>, Nurlina<sup>5</sup>, Fitriani<sup>6</sup>

<sup>1</sup>Hamdana, Panrita Husada College of Health Sciences (Indonesia)

<sup>2</sup>A. Nurlaela Amin, Panrita Husada College of Health Sciences (Indonesia)

<sup>3</sup>Muhammad Reza Asmadi, Panrita Husada College of Health Sciences (Indonesia)

<sup>4</sup>Amirullah, Panrita Husada College of Health Sciences (Indonesia)

<sup>5</sup>Nurlina, Panrita Husada College of Health Sciences (Indonesia)

<sup>6</sup>Fitriani, Panrita Husada College of Health Sciences (Indonesia)

\*Corresponding author: [alheaamin@gmail.com](mailto:alheaamin@gmail.com)

### Abstract

*Type 2 diabetes mellitus is a disease characterized by increased blood sugar levels. Diabetic mellitus patients often experience a low quality of life. This decline in quality of life is usually caused by the lack of family support and the patient's inability to manage self-care. Quality of life is important to receive serious attention because a decrease in the patient's quality of life will worsen the patient's disease and increase the mortality rate. This study aims to determine the relationship between family support, self-care management, and patients' quality of life with type 2 diabetes mellitus. This study is quantitative research using a cross-sectional approach. The number of samples in this study was 49 people using the purposive sampling technique. The chi-square test results on the relationship between family support and the quality of life of type 2 diabetes mellitus patients obtained a  $p$ -value = 0.000. In contrast, the relationship between self-care management and the quality of life of type 2 diabetes mellitus patients obtained a  $p$ -value = 0.000 ( $p < 0.005$ ). It concluded that there is a relationship between family support and self-care management and the quality of life of type 2 diabetes mellitus patients.*

**Keywords:** Family support, Self-care management, Quality of life, Diabetes mellitus.

### 1. INTRODUCTION

Diabetes is a chronic metabolic disease characterized by increased blood glucose levels that can cause severe damage to the heart, blood vessels, eyes, kidneys, and nerves over time. The most common is type 2 diabetes, usually in adults who experience a condition in which the body becomes resistant to insulin or does not produce enough insulin [1]. Diabetes is the leading cause of death worldwide, with approximately 6.7 million deaths due to diabetes itself or its complications. Worldwide, over 90% of diabetics suffer from type 2 diabetes mellitus [2]. Diabetes mellitus type 2 (DMT2) is a chronic disease with rapidly increasing prevalence, high morbidity, and various complications of progressive diabetes, particularly in low- and middle-income countries [3] [4].

According to the International Diabetes Federation 2021, the number of people suffering from diabetes mellitus worldwide is 537 million people. This number is estimated to continue to increase by 643 million people in 2030. In 2045, there may be another increase of 783 million people [2]. Currently, Indonesia ranks fifth out of ten countries in the world, with 19.5 million adults aged 20 to 79 suffering from diabetes mellitus. According to the 2018 Basic Health Research (Riskesdas), 1,017,290 people suffer from diabetes mellitus based on medical diagnoses per province, with around 33,693 people in South Sulawesi Province ranking seventh [5].

Diabetes mellitus (DM) is a chronic disease that significantly impacts patients' quality of life [6]. Overall, patients with type 2 diabetes harm quality of life with or without complications. Diabetes also affects various domains such as physical function, emotional well-being, social functioning, economic status, and general health in the patient's life, thus affecting the quality of life [7]. Proper management and care are very important to maintain a good quality of life for patients [8].

The results of research conducted by Irawan on factors affecting the quality of life of patients with type 2 diabetes mellitus revealed the results of the relationship between gender, duration of suffering, knowledge, fear, stress, family support, and self-care quality of life of patients with Type 2 diabetes mellitus [9]. Family support is important to improve the patient's quality of life. This includes emotional support, appreciation, tools, and information that can increase confidence in his or her ability to engage in self-care to improve quality of life. Conversely, low family support can result in the risk of reduced quality of life [10]. Self-care management plays a very important factor in improving the quality of life of type 2 DM patients [11]. To improve patient's quality of life and prevent complications, implementing self-care management is very important [12]. Diet, physical activity, blood glucose monitoring, medication adherence, and foot care are aspects of self-care management [13]. A decline in the physical, psychological, social, and environmental quality of life of patients with diabetes mellitus is often the result of the patient's inability to engage in self-care independently [12].

Bulukumba Health Office data in 2022 revealed that there were 7,820 people with diabetes mellitus in Bulukumba town, and in 2023 the number increased to 14,759 people. Batang Health Center, one of the health centers in Bontotiro District, accommodates 277 people with diabetes mellitus in 2022. In 2023, there will be 775 people, making Batang Health Center 6th with the highest number of people with diabetes mellitus out of 21 health centers in Bulukumba Regency. Low family support and self-care management will undoubtedly harm the quality of life of diabetes mellitus patients. In addition to the role of the caregiver, the family's active role in managing the nutritional program, physical exercise, and medication adherence is a form of family support for the success of diabetes mellitus treatment. By implementing comprehensive care with the involvement of families, complications are to be prevented and overcome to achieve a good quality of life. Based on these issues, this study aims to determine the relationship between family support and self-care management and the quality of life of patients with type 2 diabetes mellitus.

## **2. METHODOLOGY**

This research was quantitative research with a cross-sectional approach. The sample of this study included 49 individuals identified through purposive sampling. The inclusion criteria were willingness to participate in the survey, being >18 years old, cooperative, and able to perform activities. The exclusion criteria were respondents with complications from diabetic

ulcers and/or paralysis, cognitive impairment, mental disorders, and those who were not hospitalized in the health center. This research received ethical approval from KEP Stikes Panrita Husada Bulukumba number 000436/KEP Stikes Panrita Husada Bulukumba/2024. This research was conducted in the workspace of Batang Health Center in April-May 2024.

The research instruments were the Hensarling Diabetes Family Support Scale (HDFSS) questionnaire to measure family support variables, the Summary of Diabetes Self-Care Activities (SDSCA) questionnaire to assess self-care management, and the WHOQOL-BREF questionnaire to assess quality of life. The questionnaire passed the validity and reliability test. The data was then analyzed using the statistical chi-square test.

### 3. RESULTS

#### 3.1 Respondent Characteristics

*Table 1: Respondent Characteristics*

Respondent Characteristics	Frequency (n)	Percentage (%)
Age		
36 – 45 years old	8	16, 3
46 – 55 years old	16	32,7
56 – 65 years old	18	36,7
> 65 years	7	14, 3
Gender		
Man	10	20, 4
Woman	39	79, 6
Work		
Not Working	6	12, 2
Housewife	16	32, 7
Self-employed	24	49, 0
Civil servant	3	6,1
Education		
Elementary	14	28,6
Junior High School	10	20, 4
Senior High School	21	42,9
Undergraduate	4	8,2
Duration of illness		
< 5 years	36	73, 5
≥ 5 years	13	26, 5
Total	49	100

Table 1 shows that most respondents had an age range of 46 to 65 years (18, 36.7%), with the lowest age range being >65 years (14.3%). Based on gender, there were 39 women (79.6%) and 10 men (20.4%). Based on employment, most respondents were self-employed (24, 49.0%), and the fewest were civil servants (6.1%). Most respondents had a college degree (21, 42.9%), with the lowest proportion having a bachelor's degree (4, 8.2%). Based on disease onset, the disease lasted <5 years for most respondents (36, 73.5%) and ≥5 years for the remaining (13, 26.5%).

#### 3.2 Analysis of the Relationship between Family Support and Quality of Life of Type 2 Diabetes Mellitus Patients.

**Table 2:** *The Relationship Between Family Support and Quality of Life  
Type 2 Diabetes Mellitus Patients*

Family Support	Quality of Life				Total		P
	Good		Not Good		N	%	
	N	%	N	%			
Good	27	55,1	0	0,0	27	55,1	0,000
Not Good	2	4,1	20	40,8	22	44,9	
Total	29	59,2	20	40,8	49	100	

The result shows that good family support correlated with a good quality of life for as many as 27 people (55.1%). In comparison, those who received poor family support had a good quality of life for as many as 2 people (4.1%), and those with poor family support had a poor quality of life for as many as 20 people (40.8%). After the chi-square test, a significance  $p$ -value of 0.000 ( $p < 0.05$ ) was obtained. It can be concluded that there was a relationship between family support and the quality of life of type 2 diabetes mellitus patients.

Diabetes mellitus patients will be motivated to continue trying to achieve their recovery if they have good family support. Families and family members will provide emotional support, appreciation, instrumental, and information. Patients will get psychological support from a good approach, making them comfortable and motivated to continue their treatment [14] [15]. The life of every diabetic patient is unique, and they psychologically feel burdened by the various rules they have to follow because of their illness. Quality of life is an individual's perception of their place in life in the context of the culture and value system in which they live and concerning their goals, expectations, standards, and concerns [16]. Therefore, assessing the patient's quality of life is important because everyone perceives their physical, emotional, and social health differently, including satisfaction of cognitive elements and emotional happiness. There are a variety of factors associated with short- and long-term diabetes management that can negatively or positively affect quality of life [17]. In general, patients with type 2 diabetes mellitus have an inadequate quality of life. Of course, family members need to support them by implementing an integrated management strategy [18].

Patients who receive good family support feel comfortable, feel valued, and have a better outlook on life, which, of course, can have an impact on preventing anxiety. In addition, good family support can motivate patients to continue their ongoing treatment and help them manage type 2 diabetes mellitus better, more regularly, and more specifically, so that patients do not become overwhelmed by the disease they suffer from and feel burdened. The length of time patients suffer from diabetes mellitus affects their self-efficacy because the longer they can deal with the disease, the more experience they gain in dealing with problems related to their disease. Likewise, patients with a level of education and a job that provides them with income can still manage their illnesses without involving others, especially their families. Even if their family support is not good, they still have a good quality of life. However, regarding the quality of life, respondents still felt that their lives had meaning, patients' illnesses did not interfere with their work activities, and respondents could still finance their lives and independently find type-2 DM information.

Patients who get good family support will feel comfortable, feel appreciated, and have a better outlook on life, which, of course, can have an impact on the prevention of anxiety that will be experienced. In addition, good family support can motivate patients to continue their ongoing treatment and help patients carry out better, regular, and directed management of type 2 diabetes mellitus so that patients do not feel burdened with the disease they suffer. The length of time patients suffer from diabetes mellitus will impact their self-efficacy because the longer the opportunity they must study the disease and, of course, get a lot of experience to deal with problems that arise related to their disease. Likewise, with a level of education and a job that can generate income, patients can still manage their diseases without involving others, namely their families, so even though the family support they get is not good, they still have a good quality of life. However, in terms of sound quality of life, because the respondents still felt that their lives were meaningful, the diseases suffered by the patients did not interfere with their work activities, and the respondents were still able to finance their lives and were able to find information about type 2 DM independently.

These results are supported by Zovancha and Wijayanti's research, which states that the longer a person suffers from diabetes mellitus, the better its effectiveness. The longer a person suffers from the disease, i.e. > 5 years, the more opportunities he has to learn about the disease and gain more experience in dealing with problems arising from the disease so that they tend to be treated despite the lack of it have a good quality of life with family support [19]. In addition, a person suffering from diabetes mellitus for less than five years may have negative effects on the patient, such as a lack of understanding that diabetes mellitus has an impact on his health [20].

### 3.3 Analysis of the Relationship between Self-Care Management and Quality of Life of Type 2 Diabetes Mellitus Patients.

**Table 3:** The Relationship Between Self Care Management and Patient Quality of Life Diabetes Mellitus Tipe 2

Diabetes Mellitus Tipe 2							P
Self-Care Management	Quality of Life				Total		
	Good		Not Good		N	%	
	N	%	N	%			
Good	27	55,1	4	8,2	31	63,3	0,000
Not Good	2	4,1	16	32,7	18	36,7	
Total	29	59,2	20	40,8	49	100	

Table 3 shows that good self-care management correlated with a good quality of life in as many as 27 people (55.1%) and good self-care management with a poor quality of life in 4 people (8.2%). Meanwhile, respondents with poor self-care management with a good quality of life were 2 people (4.1%), and poor self-care management with a poor quality of life was 16 people (32.7%). After the chi-square test, a significance  $p$ -value = 0.000 ( $p < 0.05$ ) was obtained. It can be concluded that there was a relationship between self-care management and the quality of life of type 2 diabetes mellitus patients.

Self-care management is the ability of individuals, families, and communities to improve health, prevent diseases, maintain health, and overcome diseases and disabilities with or without the help of healthcare providers [21]. Individuals choose self-care management for various positive reasons, including convenience, cost, empowerment, and conformity with values or lifestyle. Given that ideal and well-functioning health systems are rarely realized, especially in resource-constrained environments, individuals may also opt for self-care management interventions to avoid health systems due to poor quality of services or due to inappropriate, unreachable, or inaccessible information, interventions [22]. Self-care management has a significant role in situations like this [23].

Most diabetes self-care management is managed by the patient's family or by the patient himself, so there is an urgent need to take actions that can be taken to control diabetes independently. These activities are monitoring blood glucose, eating a healthy diet, staying physically active, staying compliant with the treatment regime, taking medication on time, and reducing risky behaviors. This activity has shown promising results in controlling blood glucose levels, reducing diabetes complications, and maintaining and improving quality of life [24]. The ability to carry out activities plays a role in initiating and maintaining health behaviors, so it is believed that improving one's ability to carry out health behaviors will result in improved health and an increase in behavior and quality of life [25].

Good self-care management will reduce symptoms such as pain and fatigue, improve the coping mechanism for stress or depression felt due to the disease they suffer, and there will increase confidence in improving their health. It can also increase patient satisfaction, which will have implications for improving the patient's quality of life. However, despite good self-care management, respondents were still found to have a poor quality of life. This is because respondents experience anxiety. Good self-care management can prevent anxiety, but some people have higher levels of anxiety, so they need more severe management than just self-care management. Anxiety can occur due to factors from the disease itself, for example, diseases that do not heal and the impact of the disease that does not necessarily occur. If anxiety continues, it will affect the decline in quality of life, especially in the psychological domain, making the quality of life of type 2 DM patients less suitable.

Anxiety is a symptom that people with diabetes mellitus commonly feel. Anxiety is an unpleasant feeling that refers to feelings of worry, fear, and anxiety caused by threats or disturbances with something that has not yet happened. A person who often experiences anxiety can experience a decreased quality of life, especially in psychological disorders [26] [27]. Respondents who carried out self-care management were not good but had a good quality of life because the respondents suffered from type 2 <5 years of diabetes mellitus, so they could not follow the diet pattern according to the doctor's direction and did not do physical activity. However, they have a good quality of life because the respondents accept their condition, the symptoms they feel are tolerable, and no complications are experienced. Complications that occur due to diabetes mellitus are a severe condition. Complications of diabetes mellitus arise due to increased blood glucose levels over a long period [28]. The appearance of hypertension, complications



in the heart, and ulcers are some of the complications that can appear in patients with diabetes mellitus, which can reduce the quality of life from various dimensions, especially physical, social, and psychological. Likewise, someone who does not experience complications will result in a better quality of life [29][30]. The research highlights the need for self-care and self-management for those with a diabetes diagnosis, a period in which intercession can provide the most significant benefits for long-term educational and management opportunities. Early attention and active management are essential to developing a management plan that includes self-management education, dietary follow-up, physical activity, and behavioral changes to optimize blood glucose and reduce diabetes-related complications [31]. It should be understood that diabetes is a multidimensional problem, a systematic and integrated approach is needed to facilitate self-care management among individuals with diabetes to avoid and prevent long-term chronic complications. Along with these things, it also requires the patient's self-ability and different self-management abilities and techniques. Diabetes is a lifelong disease, and the need to undergo lifestyle changes, self-care, and management is identified as a significant thing in the treatment of diabetes mellitus [24].

#### 4. CONCLUSIONS

This study concludes that there is a relationship between family support and self care management and the quality of life of type 2 diabetes mellitus patients. It is hoped that patients will get full support from their families, improve self-care management for the healing process, and improve health.

#### 5. ACKNOWLEDGEMENTS

WE WANT TO EXPRESS OUR DEEPEST GRATITUDE TO THE BONTOTIRO SUB-DISTRICT GOVERNMENT AND ALL RANKS OF THE BATANG HEALTH CENTER FOR THEIR ASSISTANCE IN COMPLETING THIS RESEARCH PROCESS. ESPECIALLY THANK YOU TO THE RESPONDENTS WHO HAVE TAKEN THE TIME TO BE INVOLVED IN THIS RESEARCH AND THEIR ENTHUSIASM FOR IMPROVING THE QUALITY OF LIFE IN DEALING WITH DIABETES MELLITUS.

#### 6. REFERENCE

- [1] E. W. Gregg *et al.*, "Improving health outcomes of people with diabetes: target setting for the WHO Global Diabetes Compact," *Lancet*, vol. 401, no. 10384, pp. 1302–1312, 2023.
- [2] IDF, *IDF Diabetes Atlas 10th edition*. 2021.
- [3] N. G. Forouhi and N. J. Wareham, "Epidemiology of diabetes," *Medicine (Baltimore)*, vol. 47, no. 1, pp. 22–27, 2019.
- [4] J. Qin *et al.*, "Effect of Tai Chi on Quality of Life, Body Mass Index, and Waist-Hip Ratio in Patients With Type 2 Diabetes Mellitus: A Systematic Review and Meta-Analysis," *Front. Endocrinol. (Lausanne)*, vol. 11, no. January, pp. 1–13, 2021, doi: 10.3389/fendo.2020.543627.
- [5] RISKESDAS, *Laporan Nasional Riskesdas 2018 Kementerian Kesehatan RI Badan Penelitian Dan Pengembangan Kesehatan*. 2018.
- [6] E. V. Pereira, F. S. Tonin, J. Carneiro, R. Pontarolo, and A. Wiens, "Evaluation of

- the application of the diabetes quality of life questionnaire in patients with diabetes mellitus," *Arch. Endocrinol. Metab.*, vol. 64, no. 1, pp. 59–65, 2020, doi: 10.20945/2359-3997000000196.
- [7] V. B. Prajapati, R. Blake, L. D. Acharya, and S. Seshadri, "Assessment of quality of life in type II diabetic patients using the modified diabetes quality of life (MDQoL)-17 questionnaire," *Brazilian J. Pharm. Sci.*, vol. 53, 2018.
- [8] N. Mutmainnah, M. Al Ayubi, and A. Widagdo, "Kepatuhan dan Kualitas Hidup Pasien Diabetes Melitus Tipe 2 di Rumah Sakit di Jawa Tengah," *Pharm. J. Farm. Indones.*, vol. 17, no. 2, pp. 165–173, 2020, doi: 10.23917/pharmacon.v17i2.12281.
- [9] E. Irawan, H. A. Fatih, and Faishal, "Faktor faktor yang mempengaruhi kualitas hidup pasien Diabetes Mellitus Tipe II di Puskesmas Babakan Sari," *J. Keperawatan BSI*, vol. 9, no. 1, pp. 74–81, 2021.
- [10] E. Suwanti, S. Andarmoyo, and L. E. Purwanti, "Hubungan Dukungan Keluarga Dengan Kualitas Hidup Pasien Diabetes Mellitus Tipe 2," *Heal. Sci. J.*, vol. 5, no. 1, pp. 70–88, 2021.
- [11] H. Saragih, M. S. D. Simanullang, and L. F. Br Karo, "Hubungan Self Care Dengan Kualitas Hidup Pasien Dm Tipe 2," *J. Ilm. Keperawatan IMELDA*, vol. 8, no. 2, pp. 147–154, 2022, doi: 10.52943/jikeperawatan.v8i2.1001.
- [12] S. Solikin and M. R. Heriyadi, "Hubungan Self Management Dengan Kualitas Hidup Pasien Diabetes Melitus Di Puskesmas Landasan Ulin," *Din. Kesehat. J. Kebidanan Dan Keperawatan*, vol. 11, no. 1, pp. 432–439, 2020, doi: 10.33859/dksm.v11i1.545.
- [13] Wayunah, T. Hidayatin, and Ayunda, "Self Care Management Sebagai Upaya Mengontrol Kadar Glukosa Darah Pada Penderita Diabetes Mellitus: A Literature Review," *J. Kesehat. Indra Husada*, vol. 8, no. 2, pp. 267–274, 2020.
- [14] A. Y. Mulyani, Arman, and S. Patimah, "Analisis Faktor Yang Mempengaruhi Kualitas Hidup Pasien Diabetes Melitus Tipe II di Rumah Sakit Umum Daerah Lasinrang Kabupaten Pinrang Tahun 2022," *J. Muslim Community Heal.*, vol. 4, no. 4, pp. 345–357, 2023.
- [15] Setyoadi, A. Yusuf, N. D. Kristianingrum, Y. S. Hayati, L. W. Noviyanti, and N. F. Syafiky, "The correlation between family support and health status in patients with diabetes mellitus," *Healthc. Low-Resource Settings*, vol. 11, no. S1, pp. 1–6, 2023, doi: 10.4081/hls.2023.11212.
- [16] A. N. Amin and N. Alfira, "Peningkatan Kualitas Hidup Ibu Rumah Tangga Usia 40 Tahun Ke Atas Dalam Pencegahan Stroke," *J. ABDIMAS Panrita*, vol. 4, no. 2, pp. 74–83, 2023.
- [17] R. John, S. Pise, L. Chaudhari, and P. R. Deshpande, "Evaluation of Quality of Life in Type 2 Diabetes Mellitus Patients Using Quality of Life Instrument for Indian Diabetic Patients: A Cross-Sectional Study," *J. Midlife. Health*, vol. 10, no. 2, 2019, [Online]. Available: [https://journals.lww.com/jomh/fulltext/2019/10020/evaluation\\_of\\_quality\\_of\\_life\\_in\\_type\\_2\\_diabetes.6.aspx](https://journals.lww.com/jomh/fulltext/2019/10020/evaluation_of_quality_of_life_in_type_2_diabetes.6.aspx)
- [18] J. N. Zurita-Cruz, L. Manuel-Apolinar, M. L. Arellano-Flores, A. Gutierrez-Gonzalez, A. G. Najera-Ahumada, and N. Cisneros-Gonzalez, "Health and quality of life outcomes impairment of quality of life in type 2 diabetes mellitus: a cross-



- sectional study," *Health Qual. Life Outcomes*, vol. 16, pp. 1–7, 2018.
- [19] R. O. Zovancha and A. C. Wijayanti, "Hubungan Antara Dukungan Keluarga dengan Kualitas Hidup Penderita Diabetes Melitus Tipe 2 di Surakarta," *J. Kesehat. Masy. Indones.*, vol. 16, no. 3, pp. 182–188, 2021, doi: 10.26714/jkmi.16.3.2021.182-188.
- [20] A. B. Tombong and A. N. Amin, "Long-Standing Type-2 Diabetes Mellitus Is Related to Neuropathy Incidence: A Cross Sectional Study," *Compr. Heal. Care*, vol. 5, no. 1, pp. 32–43, 2021.
- [21] W. H. Organization, *WHO guideline on self-care interventions for health and well-being, 2022 revision*. World Health Organization, 2022.
- [22] M. Narasimhan, P. Allotey, and A. Hardon, "Self care interventions to advance health and wellbeing: a conceptual framework to inform normative guidance," *Bmj*, vol. 365, 2019.
- [23] W. H. Organization, "Ethical, legal, human rights and social accountability of self-initiated interventions," 2018.
- [24] F. Ahmad and S. H. Joshi, "Self-Care Practices and Their Role in the Control of Diabetes: A Narrative Review," *Cureus*, vol. 15, no. 7, 2023.
- [25] A. N. Adil and A. N. Amin, "Phenomenological Study of Quality of Life in Chronic Kidney Failure Patients Undergoing Hemodialysis," *Compr. Heal. Care*, vol. 7, no. 3, pp. 251–267, 2023.
- [26] Y. Kadang, M. Awal, M. T. Abdullah, Herman, and Z. Rusli, "Faktor Yang Mempengaruhi Kualitas Hidup Pasien Diabetes Mellitus Tipe 2 Di Puskesmas Sudiang Raya," *Media Kesehat. Politek. Kesehat. Makassar*, vol. XVI, no. 2, pp. 224–228, 2021.
- [27] S. Cakmak and E. Gen, "Relationship between quality of life, depression and anxiety in type 1 and type 2 diabetes," *Dusunen Adam - J. Psychiatry Neurol. Sci.*, vol. 33, no. 2, pp. 155–169, 2020, doi: 10.14744/DAJPNS.2020.00075.
- [28] Hariani, A. Hady, N. Jalil, and S. A. Putra, "Hubungan Lama Menderita Dan Komplikasi Dm Terhadap Kualitas Hidup Pasien Dm Tipe 2 Di Wilayah Puskesmas Batua," *J. Ilm. Kesehat. Diagnosis*, vol. 15, no. 1, pp. 56–63, 2020.
- [29] T. B. Pham *et al.*, "Effects of Diabetic Complications on Health-Related Quality of Life Impairment in Vietnamese Patients with Type 2 Diabetes," *J. Diabetes Res.*, vol. 2020, 2020, doi: 10.1155/2020/4360804.
- [30] R. Tamornpark, S. Utsaha, T. Apidechkul, D. Panklang, F. Yeemard, and P. Srichan, "Quality of life and factors associated with a good quality of life among diabetes mellitus patients in northern Thailand," *Health Qual. Life Outcomes*, vol. 20, no. 1, pp. 1–11, 2022, doi: 10.1186/s12955-022-01986-y.
- [31] J. J. Eva *et al.*, "Self-care and self-management among adolescent T2DM patients: a review," *Front. Endocrinol. (Lausanne)*, vol. 9, p. 489, 2018.