

## Analysis of factors affecting the quality of life of people with type II Diabetes Mellitus

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ARTICLE INFO	ABSTRACT
<b>Keywords:</b> diabetes mellitus, quality of life, health.	Diabetes Mellitus is still a global health problem that has an impact on the welfare of individuals, families and communities and affects the quality of life of sufferers. The purpose of this study was to determine the factors that affect the quality of life of people with diabetes mellitus. This type of study used a cross sectional approach to 132 people with diabetes mellitus selected with a purposive sampling approach. Data collection by conducting interviews with type 2 DM patients and filling out the Diabetes Quality of Life Clinical Trial Questionnaire (DQLCTQ) questionnaire. The data analysis carried out was univariate and bivariate analysis using chi-square test and multivariate analysis using multiple logistic regression tests. The results showed that there was a relationship between knowledge ( $p = 0.000$ ), dietary adherence ( $p = 0.044$ ), medication adherence ( $p = 0.000$ ), and family support ( $p = 0.000$ ) with the quality of life of patients with type II diabetes. Of several factors, knowledge / education is the factor that has the strongest influence on the quality of life of people with type II DM.

## INTRODUCTION

Diabetes mellitus (DM) is still a global health problem that has a major impact on the well-being of individuals, families, and communities (Saeedi et al., 2019). Based on International Federal diabetes data in 2021, there are 536.6 (10.5%) of the world's population suffering from DM while in Indonesia sufferers reach 19.5 billion cases and rank fifth in the world (Federal, 2021). And in Aceh the number of patients reached 121,160 people in 2020 (Aceh, 2020). The increase in the prevalence of diabetes from year to year occurs in the age group of 45-54 years, 55-64 years, 65-74 years, and over 75 years (RI, 2020). An increase in these diseases can increase economic losses (Luthiani, Karota, & Sitepu, 2020).

Diabetes mellitus (DM) It is a metabolic disorder characterized by high blood sugar levels due to impaired insulin function, and requires ongoing medical care with strategic risk reduction of various factors beyond glycemic control. DM is classified as a non-communicable disease but is chronic so that it can reduce the productivity of sufferers and have an impact on reducing income, as well as reducing the quality of life of patients due to complications caused (Marasabessy, Nasela, & Abidin, 2020). DM can be recognized by high blood sugar levels (KGD) and signs of tremors caused by thirst and excessive drinking, frequent urination especially at night, often feel hungry and weight loss quickly, decreased sexual desire, tingling, others (Wahyuni, 2020).

In addition to seeing the signs of symptoms that appear, the diagnosis of diabetes can be done by examining blood samples to calculate KGD. KGD tests include checking blood sugar during (GDS), fasting blood sugar (GDP), blood sugar 2 hours after meals (GD2PP) and HbA1C. Blood sugar examination is done through sampling in the form of blood plasma from veins. a person suffers from diabetes mellitus if obtained KGDS  $\geq 200$  mg / dl and KGD Fasting  $\geq 126$  mg / dl (Siska Sakti Angraini, Apriyeni, & Jesica, 2015) The problem that is often experienced by people with diabetes mellitus is the inability of patients to control blood sugar levels. The consequences will be able to cause diabetic ketoacidosis, nonketosis hyperosmolar hyperglycemia syndrome, coronary artery disease, hypertension, retinopathy, nephropathy, leg and foot ulcers, sensorimotor neuropathy, and autonomic neuropathy (INSANA MARIA, 2021). And can cause complications of diseases for sufferers such as hypertension,

blindness, kidney failure, heart attack, stroke, ulcer and amputation (WHO, 2021). These complications can affect the patient's quality of life both physically, psychologically, socially and environmentally (Schweyer, 2017).

Quality of life is an individual's perception of his life in society in the context of existing cultures and value systems related to goals, expectations. Standard, and also considerate. Quality of life is also defined as the level of satisfaction felt with various aspects of life both physically, psychologically, and socially (Ekasari, Riasmini, & Hartini, n.d.). Quality of life can be seen from two dimensions both objectively based on observations, external individuals such as standard of living, income, education, health status, age, and most importantly how the individual can control and consciously direct his life. While the quality of life is subjectively based on the psychological response of individuals to the satisfaction and happiness of life or with the word *laim* as an individual's perception of how a good life is perceived by each individual he has (Ekasari et al., n.d.). One of the instruments for measuring the quality of life of DM sufferers is Diabetes Quality of Life (DQoL) which serves to measure satisfaction, impact, and worry in DM2 patients. This tool measures individual satisfaction with various components including their concerns both social and future and the magnitude of the impact caused (Farahdina, 2018).

Based on the results of research conducted by rahmawati, Nurlita and Widiyati (2022) on 58 women with diabetes mellitus, it was found that 38% of these patients had poor quality, 34% had medium quality of life, 34% had good quality of life and only 4% had very good quality of life (Rahmawati, Nurlita, & Widiyati, 2022). Furthermore, the assessment of the quality of life of people with diabetes mellitus using DQoL shows that the quality of life of diabetes mellitus patients is in the medium category with a perdimensional description, namely the physical dimension with a medium category, 61.5% medium quality for the psychological domain, 60.4% medium quality for the social domain, 58,2% medium quality for social relations domain, and 53.8% medium quality for environment domain (Miftah Hudatul Umam, Tetti Solehati, 2020) (Haque & El Bayani, 2023).

The quality of life of DM patients is influenced by several factors including disease complications, age of DM sufferers, socioeconomic status, female gender, marital status (Siska Sakti Angraini et al., 2015). People with diabetes mellitus who have a poor quality of life will further worsen the condition of a disease, as well as a better quality of life will further alleviate a disease.

Quality of life that tends to be less good if accompanied by psychological problems will be able to cause metabolic disorders either directly through hormonal stress or indirectly, namely through complications of diseases that arise. Based on the description above, researchers feel interested in analyzing factors that can affect the quality of life of people with diabetes mellitus with the aim that patients will further minimize factors that can reduce their quality of life.

## METHOD

This type of study used a cross sectional approach to 132 people with diabetes mellitus in the city of Banda Aceh who were selected with a purposive sampling approach based on criteria that had been prepared. The inclusion criteria for respondents include composable awareness, willing to be respondents, women and men, non-geriatrics ( $\leq 60$  years) and geriatrics ( $\geq 60$  years), while exclusion criteria include pregnant and lactating women, and are not willing to be involved until the end of the study. Data collection was carried out by conducting interviews and filling out the Diabetes Quality of Life Clinical Trial Questionnaire (DQLCTQ) questionnaire as well as identifying medical records from respondents. The data analysis carried out was univariate and bivariate analysis using chi-square test and multivariate analysis using multiple logistic regression test.

## RESULTS AND DISCUSSION

### Analysis Univariat

Table 1. Distribution of Univariate Data Analysis Results

Indicator	N	%
<b>Age</b>		
Nongeriatrik	56	42,4
Geriatrics	76	57,6
<b>Gender</b>		
Man	62	47
Woman	70	53
<b>Education</b>		

Basis	32	24,2
Intermediate	28	21,2
Above	54	42,0
Tall	18	13,6
<b>Long Suffering from DM</b>		
< 5 Years	35	26,5
≥ 5 Years	97	73,5
<b>Marital Status</b>		
Unmarried	5	2,3
Married	104	78,8
Janda/doubt	23	18,9
<b>Quality of Life</b>		
Bad	52	39,2
Good	80	60,8
<b>Knowledge</b>		
Less	43	32,6
Enough	89	67,4
<b>Physical Activity</b>		
Less	78	59,1
Enough	54	40,9
<b>Dietary Adherence</b>		
Obedient	92	69,7
Disobedient	40	30,3
<b>Adherence to taking medication</b>		
Obedient	59	44,7
Disobedient	73	55,3
<b>Family Support</b>		
Negative	87	65,9
Positive	45	34,1

## Bivariate Analysis

Table 2. The influence of knowledge, physical activity, dietary adherence, medication adherence and family support to quality of life

Variable	Quality of Life				Total		P Value
	Bad		Good				
	n	%	n	%	n	%	
Knowledge							
Less	8	6.1	9	6,8	7	100	0,000
Enough	53	40.2	62	47.0	115	100	
Physical Activity							
Less	43	32.6	49	37,1	92	100	0,062
Enough	19	14,4	21	15,9	40	100	
Dietary Adherence							
Obedient	52	39,4	64	48,5	116	100	0,044
Disobedient	9	6,8	7	5,3	16	100	
Adherence to taking medication							
Obedient							0,000
Disobedient	13	9.8	32	24,3	45	100	
	66	50	21	15,9	87	100	
Family Support							
Negative							0,000
Positive	32	24,3	15	11,3	47	100	
	18	13.6	67	50.8	85	100	

## Multivariate Analysis

Table 3. Results of Logistic Regression Analysis

Independent Variables		Sig.	95% C.I.For EXP(B)	
			Lower	Upper
Step 1a	Knowledge	.000	1.827	11.302
	Physical Activity	.429	.673	2.346
	Dietary Adherence	.042	.991	6.282
	Obedient to Take Medicine	.023	.830	5.892
	Family Support	.051	.578	1.879
	Consist	.000		
Step 2a	Knowledge	.000	1.722	12.042
	Dietary Adherence	.003	.981	6.242
	Obedient to Take Medicine	.032	.872	5.822
	Family Support	.043	.569	1.819

## Discussion

Based on the results of a study of 132 people with diabetes mellitus (DM) who were respondents, it was found that the dominance of DM sufferers was in the geriatric age category (57.6%). This is in accordance with Luthfa's research (2018) which states that someone who is over the age of 50 years is increasingly at risk of developing DM due to a decreased immune state. This will be further exacerbated if the elderly when they are young have a bad lifestyle and rarely do sports so that with increasing age where a person experiences physical deterioration it will further increase the risk of developing a disease including diabetes mellitus. This is in accordance with the results of research obtained in research where the dominant respondents in the physical activity category are in the less category (59.1%).

Bivariate test results also still found 32.6% of patients with less activity had a poor quality of life. Physical activity is believed to control blood sugar because glucose will be converted into energy during activity which causes insulin to increase and causes blood sugar levels to decrease. According to Kemekes, someone who rarely exercises, when there are food substances that enter the body, it cannot be burned optimally but will be hoarded in the body as fat and sugar. this is what causes DM if insulin is insufficient to convert glucose into energy. In addition, according to the researchers' assumptions, the high number of DM sufferers in the geriatric category is due to the dominant respondents in this study are female sex (53%). Women or women of geriatric age have entered the menopause period, where during this menopause period there are changes in hormone levels. Levels of female hormones, especially estrogen and progesterone, drop dramatically during menopause, which can affect blood sugar levels and complicate diabetes management.

Menopausal women are prone to accumulate fat in the gluteal region, but on the other hand due to hormonal and metabolic changes caused by menopause followed by the distribution of upper body fat, including the abdominal area. The drastic increase in the global incidence of obesity is accompanied by an increase in the incidence of diabetes or high sugar levels. Exogenous hormone replacement is associated with increased insulin action, due to the accumulation of adipose tissue after menopause especially in the abdominal area and is associated with an increased risk of glucose intolerance, insulin resistance, and the development of diabetes (Keyasa, M. M. R., Widyastuti, A., & Dieny, 2021). Diabetics at geriatric age and before geriatric will be more likely to experience a decrease in quality of life so special attention is needed. The quality of life in people with diabetes mellitus is greatly influenced by several things including age, type, education, length of suffering from DM, family support, knowledge, physical activity, dietary adherence, and adherence to taking medication.

## Knowledge

Based on the results of research on people with diabetes mellitus, it was found that the knowledge of people with diabetes mellitus was in the sufficient category, namely 67.4% with the dominant level of education in the upper middle category (43%). According to the assumption of researchers, education and the level of knowledge affect the quality of life of DM sufferers, this is evident from the quality of life assessment obtained in the study where the results of a predominantly good quality of life (60.8%) from people with diabetes mellitus were obtained. Knowledge is the result of a person's sensing of a certain object based on the experience they have. Knowledge of people with diabetes mellitus is a very important indicator that can help DM sufferers in carrying out treatment or therapy during their lives so that the better the knowledge they have, the easier it will be for DM

sufferers to understand how to manage their behavior or lifestyle to control their disease, in this case is controlling blood sugar levels.

Knowledge is believed to affect the quality of life of DM sufferers. Based on the results of bivariate statistical tests, a p value of 0.000 is obtained, which means that there is an influence between knowledge and quality of life of people with diabetes mellitus. the higher one's level of knowledge, the easier it will be for someone to receive information about things that support health such as how to control the disease, and easily receive information related to recovery so as to increase the compliance of DM sufferers with disease control. The good knowledge possessed is supported by the dominance of sufferers having upper secondary education. Knowledge and Education is one of the keys to success in DM management that can affect the quality of life.

DM sufferers who have high education and knowledge will be more mature in the process of self-change, so it will be easier to accept external influences that are positive, objective, and open and various information about understanding DM, self-care and the implementation of DM management including procedures for controlling blood sugar (Tampa'i, Lainsamputty, & Katiandagho, 2021). This is supported by Notoadmodjo who states that a person's knowledge is influenced by the level of education they have, the higher a person's education is believed to be the easier it will be for someone to receive information (Notoatmodjo, 2014). this is also supported by the results of research which shows a relationship between knowledge and quality of life of DM sufferers with a p value of 0.000 and a correlation coefficient of 0.975 which shows a positive correlation value with a very strong correlation (Ulfa & Muflihatin, 2022).

### **Dietary Adherence**

Diabetes diet is an important component in the management of DM because it can reduce the work of insulin by reducing the work of insulin in glucose metabolism. The results showed that it was still found that 39.4% of DM sufferers who were not obedient in implementing a diabetic diet had a poor quality of life. this can be caused because there is still a perception of DM sufferers who consider that the disease suffered is an ordeal that has been determined on it so that even though it is obedient to running a diet, if it is dead it will still die, this also causes reduced motivation for DM sufferers to recover. In addition, 48.5% of DM sufferers who have adherence to the diet have a good quality of life.

This is in line with the results of the Chi-square test which gets a p value of 0.044 showing the effect of dietary compliance on the quality of life of DM sufferers. Adherence is important because it can develop habits in helping people with DM follow a diet schedule that is sometimes difficult to do. Compliance with DM sufferers plays an important role in stabilizing blood sugar levels, compliance here can be seen from nutritional management of DM sufferers such as limiting foods that are high in glucose or replacing the main source of glucose with a substitute. DM sufferers who can run a diet optimally will be able to improve their quality of life. This is supported by the results of research by Khoirah & Audia (2018) which says that dietary compliance has a very large role in shaping the behavior of diabetes mellitus patients in running a diet. Diet adherence carried out by diabetes mellitus patients is one way to improve the quality of life of Type II Diabetes Mellitus patients (Khoirah & Audia, 2018).

### **Adherence to taking medication**

Adherence to taking medication is one indicator that can improve the quality of life of people with DM. The results showed that DM sufferers who did not comply with taking drugs with an ape quality of life of 50% this was due to the reason patients stopped taking drugs because they felt their condition was healthy, there were also reasons for forgetting to take medicine, and the boredom of DM sufferers who had to always regularly take medicine. Boredom of DM sufferers taking drugs regularly can be caused by boredom of the length of time the patient has been running therapy. This is in accordance with the results of the study obtained where there are 73.5% of respondents have suffered from DM for more than 5 years.

This condition can be overcome by providing optimal support to patients by reminding them to take medication on schedule, reminding them to bring medication when traveling, reminding not to stop taking medication if they feel healthy. Non-adherence to taking medication will have an impact on worsening quality of life, increasing the risk of disease complications and poor outcomes for people with diabetes. DM is managed with the aim of eliminating complaints, improving and improving quality of life and reducing the risk of complications. The success of this therapy can be seen from the controlled blood sugar levels of DM sufferers (Firdiawan, A., Andayani, T. M., & Kristina, 2021). The same thing is also stated that there is a significant relationship between adherence to consumption of taking antidiabetic drugs with the quality of life of patients with diabetes (Fitriani, S. A., & Mauludin, 2022).

### **Family Support**

Family support is one indicator that has a positive impact on the care of people with DM. This is because DM can have psychosocial impacts such as depression of the condition suffered so that patients can show negative sides during the process of treatment and disease control. This is where the role of family support is needed in providing motivation to carry out therapy. Support can be given in the form of sympathy, motivation, love, trust and appreciation so that sufferers who have problems will not feel burdened with their circumstances because there are still the closest people who give attention, listen and help alleviate the problems felt. Family support is closely related to welfare and health because the family is a place where a person spends the rest of his life.

The closest family support can come from the couple, in this case the husband or wife of the sufferer. Based on the results of the study, it was found that DM sufferers who had positive family support had a good quality of life of 50.8%. this is in line with the dominance of DM sufferers who are married and still have a partner (78.8%). The existence of family support will be able to arouse the motivation of sufferers to try to achieve healing. The family will also be very understanding of the needs needed by DM sufferers. In addition, the existence of a good approach will help psychologically and make sufferers achieve a sense of comfort and want to be motivated and will be obedient in carrying out DM treatment. The comfort that arises will arise because of the support both emotional, appreciation, instrumental and information from the family. This condition will prevent the emergence of stress in patients with type DM II (Mulyani & Patimah, 2023).

The results also showed that there were DM sufferers who did not receive family support experiencing a poor quality of life by 24.2%, this was because DM sufferers felt stressed in carrying out their lives with lifelong conditions without attention and support from family or closest people. Stress is believed to worsen the health condition of DM sufferers. When the body condition experiences stress, the body will produce more adrenaline hormones so that it will convert glycogen reserves in the liver into glucose. This condition results in an increase in glucose levels in the blood which if left continuously will cause complications of diabetes that will affect the quality of life (Afrianti & Dewiyuliana, 2021).

This is supported by expert opinion which states that stress and diabetes have a close relationship where stress conditions will cause increased excretion of catecholamine hormones, glucagon, glucocorticoids, endorphins, and growth hormone. Where these hormones will cause disruptions in controlling blood sugar levels (Sukarja, Sukawana, & Suyasa, 2014). It is further explained that stress can increase blood sugar content because stress can stimulate endocrine organs to secrete epinephrine which has a very strong effect in causing the process of glycogenesis in the liver so that it will release a large amount of glucose in the blood in a few minutes. Stress conditions that continue for a long time, make the role of the pancreas unable to control insulin production as a hormone controlling blood sugar (Fitri, Jafar, Indriasari, Syam, & Salam, 2021).

## CONCLUSION

Based on the results of the study, it can be concluded that the quality of life of people with diabetes mellitus in Banda Aceh City is in the good category (60.8%). The results of statistical tests also showed that there was a relationship between knowledge and quality of life ( $p = 0.000$ ), there was a relationship between dietary compliance and quality of life ( $p = 0.044$ ), there was a relationship between medication adherence and quality of life ( $p = 0.000$ ), and there was a relationship between family support and quality of life ( $p = 0.000$ ). of several factors, knowledge / education is the factor that has the strongest influence on the quality of life of type II DM sufferers in Banda Aceh City with a value of  $P = 0.000$ .

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