An Overview: Quality of Life of Diabetes Mellitus Type 2 Patients who Participate in the Prolanis Program in Sukoharjo Regency

Gusti Ayu Putu Krisna Dewi[1], Ekan Faozi[2]*

[1,2,]*Nursing Study Program, Faculty of Health Sciences, Universitas Muhammadiyah Surakarta, 57169, Central Java, Indonesia.*
Correspondence: gapkrisnadewi17@gmail.com

Abstract : *Prolanis is a health service system and a proactive approach that is implemented in an integrated manner implemented by the Social Health Facility Implementing Agency (BPJS Kesehatan). The program focuses on BPJS Health participants who suffer from chronic diseases including type 2 diabetes mellitus. Participants who take part in Prolanis are expected to achieve optimal quality of life with cost effective and efficient health services. This study aims to describe the quality of life of people with type 2 diabetes mellitus who joined the prolanis program in Sukoharjo Regency. This research is a quantitative study using descriptive methods and survey approaches. The measuring instrument used was the DQOL (Diabetes Quality of Life) questionnaire sheet. The sampling technique used in this study was convenience sampling with 95 samples. The results show that as many as 82 people (86.3%) sufferers of type 2 DM who participated in the prolanis program in Sukoharjo regency have a good quality of life with the characteristics of most women, around 61-70 years old,graduated high school, housewife, and suffer from type 2 DM for less than 5 years.*

Keywords : *Prolanis, type 2 Diabetes mellitus, Quality of Life, DQOL.*

INTRODUCTION

In 2014 there were 422 million people (8.5%) in the world suffering from diabetes mellitus, the prevalence has experienced a steady increase over the last 3 decades and is faster in countries with low and middle income compared to high-income countries (WHO, 2016). Based on 2018 Rikesdas results shows that there are an increase in the prevalence of diabetes mellitus in Indonesia in 2018 compared with the 2013 Rikesdas results, namely 6.9% of cases in 2013 rose to 8.5% in 2018 (Riskesdas 2018). The case of diabetes mellitus in the province of Central Java ranks second after hypertension at 20.57%, which makes diabetes one of the top priorities of non-transmitted disease control in Central Java. As a part of the Central Java Province, Sukoharjo Regency shows an increase in cases of diabetes mellitus that is similar to as many as 4,946 cases in 2017 rose to 8,493 cases in 2018, of which 6,527 cases included type 2 diabetes mellitus (Dinas Kesehatan Kabupaten Sukoharjo 2017, 2018). The areas with the most type 2 diabetes mellitus in Sukoharjo Regency were Nguter public heatlh center 1.215 cases, Kartasura public heatlh center 839 cases and Polokarto public health center 816 cases (Dinas Kesehatan Kabupaten Sukoharjo 2018).

If the increase in the number of cases of diabetes mellitus that occurs is not managed properly it can lead to complications. Research conducted by Hayes et al. (2016) said that some complications that occur in people with diabetes mellitus such as amputation, stroke, blindness, kidney failure, heart failure and myocardial infarction can significantly affect the decrease in the quality of life of diabetes patients. Low quality of life can affect the physical and mental well-being of diabetes patients (Rwegerera et al. 2018). Besides being able to influence physical and mental well-being, the low quality of life of diabetes patients can also reduce the quality of diabetes self-care, thereby causing a decrease in the prognosis of diabetes and increasing the occurrence of complications in patients with diabetes (Timar et al. 2016).

Prolanis is a program that was formed with the aim of preventing disease complications so that participants can achieve optimal quality of life that is implemented by the Social Health Facility Implementing Agency (BPJS Kesehatan) and primary health services to focus on hypertension and type 2 diabetes mellitus. According to research conducted by Wicaksono and Fajriyah (2018), there is a significant relationship between the activity in the Prolanis program with the quality of life of people with type 2 diabetes mellitus at the public health center Kedungwuni 2, Pekalongan. Based on the results of a preliminary study of 5 Prolanis participants at Nguter public health center, Kartasura public heatlh center and Polokarto public health center, said that they resigned themselves to their current situation and several Prolanis participants also expressed their fear of being affected by complications. Based on the description above, researchers are interested in describing the overview of the quality of life of type 2 diabetes mellitus patients who participate in the Prolanis program in Sukoharjo regency..

METHOD

This research is a quantitative study using descriptive methods and survey approaches to describe the quality of life of people with type 2 diabetes mellitus who follow the Prolanis program in Sukoharjo Regency.

The population included in this study were diabetes mellitus type 2 patients who participated in the prolanis program at the Nguter Health Center, Kartasura Health Center, and Polokarto Health Center in Sukoharjo Regency, in total 123 people. The sampling technique used in this study was convenience sampling with 95 samples. The number of samples was determined using the Slovin formula to determine the minimum sample size (n) if the size of the population (N) is known at the α significance level:

$$n = \frac{N}{1 + Na^2}$$

$$n = \frac{123}{1 + 123.0,05^2}$$

$$n = \frac{123}{1 + 123.0,0025}$$

$$n = \frac{123}{1 + 0,3075}$$

$$n = \frac{123}{1,3075}$$

$$n = 94,072$$

$$n = 95$$

The instrument to be used is a DQOL (Diabetes Quality of Life) questionnaire modified by Tyas (2008) to measure the quality of life for patients with diabetes mellitus. This questionnaire consists of 30 question items using a Likert scale range. There are 13 questions regarding domain satisfaction, 12 questions regarding the impact domain, and 5 questions regarding the worry domain. The questionnaire used was measured using a Likert scale with a score of 1-4. For questions on the impact domain, questions number 19 and 24 use a score of 4-1. After the data normality test was carried out, the data results were not normally distributed (sig. 0.000). Because the distribution of data is not normal, the categorization of data is based on quartile values (K1, K2, K3). The score results are categorized into high quality of life >102, moderate quality of life 94 ≤ 102, and low quality of life <94.

In this study the data were analyzed using univariate analysis, descriptive statistical tests and quantitative analysis techniques (including data tabulation and statistical calculations). The software used to process data in this study is IBM SPSS Statistics 22.

RESULTS

Characteristics of Respondents

Tabel 1. Frequency Distribution of Respondent Characteristics

No	Characteristics of respondents		Total	
			f	%
1.	Gender			
	a.	Male	34	35,8
	b.	Female	61	64,2
2.	Age			
	a.	< 50 years old	6	6,3
	b.	50 – 60 years old	27	28,4
	c.	61 – 70 years old	45	47,4
	d.	71 – 80 years old	15	15,8
	e.	> 80 years old	2	2,1
3.	Occupation			
	a.	Does not work	11	11,6
	b.	Trader	7	7,4
	c.	Farmer	6	6,3
	d.	Laborer	10	10,5
	e.	Private employees	5	5,3
	f.	Entrepreneur	1	1,1
	g.	Retired	22	23,2
	h.	Others	33	34,7
4.	Education			
	a.	Not attend school	14	14,7
	b.	Primary school	22	23,2
	c.	Junior high school	15	15,8
	d.	Senior high school	26	27,4
	e.	College	18	18,9
5.	Duration of diabetes mellitus			
	a.	< 5 years	38	40,0
	b.	5 – 10 years	35	36,8
	c.	11 – 15 years	13	13,7
	d.	16 – 20 years	5	5,3
	e.	> 20 years	4	4,2

Based on the data characteristics of the respondents above, the majority of respondents were female by 64.2% (61 people), age group of 61-70 years by 47.4% (45 people), the majority of respondents chose other occupational categories that were dominated by housewife by 34.7% (33 people), high school education by 27.4% (26 people), and suffering from diabetes mellitus for less than 5 years at 40% (30 people).

Distribution of DQOL

Tabel 2. Frequency Distribution of DQOL

DQOL	Frequency	Precentage (%)
Low	21	22.1
Moderate	48	50.5
High	26	27.4
Total	95	100

Based on table 2, the distribution of the quality of life of type 2 diabetes mellitus sufferers who participate in the Prolanis program shows that most respondents have sufficient quality of life that is moderate by 50.5% (48 people), then followed by high quality by life of 27.4% (26 people), and low quality of life by 22.1% (22 people).

Overview of DQOL Based on Respondent Characteristics

Tabel 3. DQOL Based on Respondent Characteristics

No	Characteristics of respondents		Low f	Low %	Moderate f	Moderate %	High f	High %
1.	Gender							
	a.	Male	4	4.2	21	22.1%	9	9.5%
	b.	Female	17	17.9	27	28.4%	17	17.9%
2.	Age							
	a.	< 50 years old	2	2.1	1	1.1	3	3.2
	b.	50 – 60 years old	7	7.4	12	12.6	8	8.4
	c.	61 – 70 years old	9	9.5	24	25.3	12	12.6
	d.	71 – 80 years old	3	3.2	10	10.5	2	2.1
	e.	> 80 years old	-	-	1	1.1	1	1.1
3.	Occupation							
	a.	Does not work	2	2.1	5	5.3	4	4.2
	b.	Trader	2	2.1	4	4.2	1	1.1
	c.	Farmer	1	1.1	3	3.2	2	2.1
	d.	Laborer	3	3.2	3	3.2	4	4.2
	e.	Private employees	2	2.1	2	2.1	1	1.1
	f.	Entrepreneur	-	-	1	1.1	-	-
	g.	Retired	1	1.1	16	16.8	5	5.3
	h.	Others	10	10.5	14	14.7	9	9.5
4.	Education							
	a.	Not attend school	3	3.2	8	8.4	3	3.2
	b.	Primary school	7	7.4	8	8.4	7	7.4
	c.	Junior high school	4	4.2	7	7.4	4	4.2
	d.	Senior high school	3	3.2	15	15.8	8	8.4
	e.	College	4	4.2	10	10.5	4	4.2
5.	Long Duration of DM							
	a.	< 5 years	9	9.5	19	20.0	10	10.5
	b.	5 – 10 years	7	7.4	20	21.1	8	8.4
	c.	11 – 15 years	2	2.1	5	5.3	6	6.3
	d.	16 – 20 years	-	-	3	3.2	2	2.1
	e.	> 20 years	3	3.2	1	1.1	-	-

Based on Table 3, the cross tabulation distribution between the characteristics of respondents and the quality of life the result are male respondents who have a low quality of life of 4.2% (4 people), moderate quality of life of 22.1% (21 people), and those who high quality of life 9.5% (9 people) while female respondents who have a low quality of life by 17.9% (17 people), moderate quality of life by 28.4% (27 people), and high quality of life by 17 , 9% (17 people).

Based on age, respondents with an age group of below 50 years old had a low quality of life by 2.1% (2 people), a moderate quality of life by 1.1% (1 person) and a high quality of life by 3.2% (3 people). Respondents in the age group by 50-60 years old had a low quality of life by 7.4% (7 people), a moderate quality of life by 12.6% (12 people) and a high quality of life of 8.4% (8 people). Respondents with the age group of 61-70 years old have a low quality of life by 9.5% (9 people), a moderate quality of life by 25.3% (24 people) and who have a high quality of life by 12.6% (12 people). Furthermore, respondents with an age group of 71-80 years old who have a low quality of life by 3.2% (3 people), a moderate quality of life by 10.5% (10 people) and who have a high quality of life by 2.1% (2 people). While respondents with an age group above 80 years old have a moderate quality of life by 1.1% (1 person) and good by 1.1% (1 person).

The cross tabulation of respondents occupation obtained results, respondents who do not work have a low quality of life by 2.1% (2 people), a moderate quality of life by 5.3% (5 people) and who have a high quality of life by 4.2% (4 people) respondents with jobs as traders who have a low quality of life by 2.1% (2 people), a moderate quality of life by 4.2% (4 people) and who have a good quality of life by 1.1% (1 person). Respondents who work as farmers have a low quality of life by 1.1% (1 person), a moderate quality of life by 3.2% (3 people), and a high quality of life by 2.1% (2 people). Respondents with jobs as laborers have a low quality of life by 3.2% (3 people), an moderate quality of life by 3.2% (3 people) and those who have a high quality of life by 4.2% (4 people). Respondents who work as private employees have low living quality by 2.1% (2 people), a moderate quality of life by 2.1% (2 people) and who have a high quality of life by 1.1% (1 person). Furthermore, respondents who work as entrepreneurs have a moderate quality of life by 1.1% (1 person). Respondents who work as retirees have a low quality of life by 1.1% (1 person), a moderate quality of life by 16.8% (16 people) and who have a high quality of life by 5.3% (5 people). Finally, respondents with other occupations have a low quality of life by 10.5% (10 respondents), moderate quality of life by 14.7% (14 people) and those who have a good quality of life by 9.5% (9 people), most of whom are housewives.

Based on the cross-tabulation of the level of education with DQOL, respondents that not attend school who have a low quality of life by 3.2% (3 people), a moderate quality of life by 8.4% (8 people) and who have a high quality of life by 3.2 % (3 people). Respondents who have attended elementary school have a low quality of life by 7.4% (7 people), an moderate quality of life by 8.4% (8 people) and who have a high quality of life by 7.4% (7 people). Respondents who have attended junior high school have a low quality of life by 4.2% (4 people), a moderate quality of life by 7.4% (7 people) and a high quality of life by 4.2% (4 people). Respondents who have attended high school education have a low quality of life by 3.2% (3 people), an moderate quality of life by 15.8% (15 people) and who have a high quality of life by 8.4% (8 people). Furthermore, respondents who attended tertiary education had a low quality of life by 4.2% (4 people), a moderate quality of life by 10.5% (10 people) and respondents who had a good quality of life by 4.2% (4 people).

Based on the cross tabulation between the duration of diabetes mellitus and DQOL respondents obtained results, the group of respondents who suffered from diabetes mellitus less than 5 years have a low quality of life by 9.5% (9 people), the quality of life is moderate by 20.0% (19 people) and those who have a high quality of life by 10.5% (10 people). The respondent group who had suffered from diabetes mellitus between 5-10 years had a low quality of life by 7.4% (7 people), an moderate quality of life by 21.1% (20 people) and who had a high quality of life by 8.4% (8 people). The respondent group who had suffered from diabetes mellitus between 11-15 years had a low quality of life by 2.1% (2 people), an moderate quality of life by 5.3% (5 people) and who had a high quality of life of 6.3% (6 person). The group of respondents who had suffered diabetes mellitus between 16-20 years had an

moderate quality of life of 3.2% (3 people), and a high quality of life of 2.1% (1 person). Furthermore, the group of respondents who had suffered from diabetes for more than 20 years had a low quality of life of 3.2% (3 people), and an adequate quality of life of 1.1% (1 person).

DISCUSSION

Respondent Characteristics

The characteristics of respondents gender showed that the majority of respondents were female, amounting to 64.2% (61 people). The majority of research respondents are elderly. In women with old age, there is a decrease in the hormone estrogen in the body, especially when the woman enters menopause. At the time of menopause in the body the body will produce less estrogen and progesterone, resulting in decreased insulin response. In addition to menopause, body mass index is not ideal for women to reduce insulin response (Taylor in Meidikayanti and Wahyuni 2017). According to Haryati and Geria in Setiyorini and Wulandari (2017) theoretically adult men have an average body fat content of 15-20% of total body weight while women have 20-25% of total body fat, so fat content in blood in women is higher than men. This puts women at risk of developing type 2 DM 3-7 times higher than men (Wijays in Setiyorini and Wulandari 2017).

Distribution of the number of respondents based on age, shows that respondents with an age group of 61-70 years amounted to 47.4% (45 people). According to PERKENI (2015) the risk of suffering from sugar intolerance increases with age. Age has a close relationship with the increasing amount of glucose in the blood, so increasing age can increase the risk of type 2 diabetes. The process of increasing age can cause changes in the body including changes in anatomy, physiology and biochemistry which can cause the body to become insulin resistant (Smeltzer and Bare 2014).

In this study 34.7% (33 people) chose other jobs. Other occupations chosen by the respondents are dominated by housewives. According to Sukardji (2009) work as a housewife is classified as light activity, in line with Sujaya's statement in Isnaini (2018) which states if someone with mild physical activity has a 4.36 times greater risk of suffering from type 2 diabetes when compared with people who have moderate and strenuous activities.

The number of respondents based on their level of education shows that the majority of respondents took high school education, amounting to 27.4% (26 people). In line with the results of Widyasari (2017) which states there is a relationship between education level and diabetes mellitus status. The lower the level of education, the higher the risk for diabetes mellitus, and vice versa. Someone with a high education level has more knowledge about health compared to someone with low education, the knowledge possessed will affect awareness to maintain health (Damayanti 2015).

Based on the duration of diabetes mellitus, most of the respondents suffered from diabetes mellitus for less than 5 years at 40% (38 people) then followed by the group of respondents who had diabetes mellitus for 5-10 years at 36.8% (35 people). In line with the results of Ningtyas et al. (2013) research that there is a significant relationship between duration of type 2 diabetes mellitus and quality of life with a p-value = 0.0848. The study states that if someone who has type 2 diabetes mellitus ≥10 years has a 4 times greater risk of having a lower quality of life when compared to someone who has type 2 diabetes mellitus for less than 10 years.

Distribution of DQOL

In this study, the quality of life of patients with type 2 diabetes is divided into 3 categories. The quality of life of respondents is said to be low if it gets results less than 94, moderate if the results obtained are in the range of values between 94 to 102, and high if it gets results of more than 102.

Based on the results of research conducted by researchers shows that patients with type 2 diabetes mellitus who follow the Prolanis program have a sufficient quality of life of 50.5% (48 people), good quality of life of 27.4% (26 people) and respondents with low quality of life 22.1% (21 people). This is

supported by research conducted by Wicaksono and Fajriyah (2018) related to the relationship between activeness in the Prolanis club on improving the quality of life of people with type 2 diabetes. The study showed that 27 people (87.1%) had a good quality of life, 2 (6.5%) people of moderate quality of life and 2 (6.5%) had poor quality of life. Where the results obtained include aspects of physical health, psychology, social, and environment. Patients are said to have a good quality of life if the conditions of the four aspects are in a balanced state (Kirana and Budiman 2016).

The results of research conducted by researchers on the quality of life of people with type 2 diabetes who participate in the Prolanis program in Sukoharjo Regency using the Diabetes Quality Of Life (DQOL) questionnaire. The questionnaire consists of 3 main domains of satisfaction or satisfaction, impact or impact, and worry or anxiety which is divided into two namely worry: social / vocational, and worry: diabetes related.

According to Suciana and Arifianto (2019), the quality of life of diabetics is an individual's subjective view of perceived satisfaction. The perceived satisfaction consists of physical, psychological, social and environmental relationships. Prolanis activities can help sufferers to think that things that are physically disruptive are not burdensome so they are not used as obstacles in their activities (Kirana and Budiman 2016). In addition, interactions that take place in Prolanis activities can help sufferers of type 2 diabetes feel satisfied with their social activities (Kirana and Budiman 2016). A good social life can provide positive energy so that a better quality of life can be achieved (Wicaksono and Fajriyah 2018).

A component that is no less important in measuring quality of life is the impact or impact felt by individuals. Most people with diabetes mellitus feel the effects of the disease, the most felt impact is pain. Teli (2017) in her research results obtained as much as 64% of individuals with diabetes mellitus complained of pain. Pain that is felt by people with diabetes mellitus can be controlled. As a forum for managing diabetes mellitus, activities in the Prolanis program such as health seminars, physical exercise, routine blood sugar checks, and pharmacological management can control pain due to diabetes mellitus felt by participants. This is supported by research by Erniantin et al. (2018), which states that most individuals who are part of the diabetes community are already quite satisfied with the treatment they are undergoing and very rarely suffer negative effects from their illness.

The impact caused by diabetes mellitus can not be denied and can cause anxiety in individuals with diabetes mellitus. Individuals with diabetes mellitus tend to feel worried about their situation in the future (Nugroho and Purwanti 2010). diabetes mellitus disease which is an incurable disease makes individuals feel burdened so that negative judgments emerge. Negative judgments cause discomfort so that it affects the patient's assessment of his well-being (Kirana and Budiman 2016). Feeling happy during Prolanis can reduce the anxiety felt by individuals with type 2 diabetes. When interacting and engaging in social activities, individuals can maintain and maintain relationships with others so that individuals feel satisfied with their social life because they can share experiences with other sufferers (Kirana and Budiman 2016).

Overview of DQOL Based on Respondent Characteristics

According to Herdianti's research (2017) there is a significant relationship between sex and quality of life of type 2 diabetes, but in her study women are believed to have lower quality of life than men. In a study conducted by researchers obtained good quality of life results on female respondents, namely as many as 17.9% (17 respondents), this is caused by compliance owned by women so that the course of treatment can be carried out better (Meidikayanti and Wahyuni 2017).

In this study the majority of elderly individuals aged 61-70 years have a good quality of life that is equal to 12.6% (12 people). That is because individuals in old age have passed the time to make changes in their lives so they tend to assess their lives more positively when compared to their youth (Nofitri in Ningtyas et al. 2013). Work has a close relationship with physical activity. Physical activity can control or reduce blood sugar levels, if the activity is carried out regularly, measured, properly and correctly (Haskas and Nurbaya 2019). Physical exercise can also reduce emotional stress and increase self-

confidence (Rahayuningsih 2013). In this study 9.5% (9 people) housewives have a good quality of life. This can be caused by various roles and responsibilities of different housewives (Teli 2017).

Ningtyas et al. (2013) in his research states that there is a significant relationship between the level of education and the quality of life of patients with type 2 diabetes. Diabetes mellitus patients with low education have a 1.9 times greater risk of having a lower quality of life than patients with type 2 diabetes mellitus with education level high (high school, university / academy). In a study conducted by researchers, 8.4% (8 respondents) who had a high school education had a good quality of life. These results can be caused by an individual's understanding of his illness. If someone who is highly educated has diabetes then this can help in understanding how to deal with the disease (Wahyuni and Vionalita 2018). That is because education can play a role in facilitating someone in understanding management, compliance with blood sugar control, overcoming symptoms that arise with proper handling and facilitating someone in preventing complications (Meidikayanti and Wahyuni 2017).

In this study the results obtained by 10.5% (10 people) of respondents who suffered from diabetes mellitus for less than 5 years have a good quality of life. This can be caused by the absence of problems due to complications felt by individuals so that anxiety arises less when compared to individuals suffering from diabetes mellitus for longer duration. Teli (2017) in her study stated that individuals who suffer from diabetes mellitus for longer duration can cause anxiety and have attachment to the emergence of various complications. The longer a person suffers from diabetes, a variety of complications will arise, so that it can affect the health perception and quality of life. If the individual has suffered from type 2 diabetes for a long duration but is accompanied by compliance and proper control even though the individual has been affected by complications, the quality of life of the individual will be good and maintained (Wahyuni and Vionalita 2018).

CONCLUSION

Based on the results of research and data analysis, it can be concluded that the characteristics of people with type 2 diabetes who participate in the Prolanis program in Sukoharjo regency are mostly female with an age range of 61-70 years, have a high school education, work as a housewife, and suffer from type 2 DM for less than 5 years.

The quality of life of people with type 2 diabetes who participate in the prolanis program in Sukoharjo Regency are mostly good. The quality of life of patients with DM based on the characteristics of respondents obtained the results of respondents with high quality of life namely women, the age group 61-70 years, working as a housewife, educated in high school, and suffering from diabetes mellitus for less than 5 years. While moderate quality of life results obtained are female respondents, age group 61-70 years old, working as a housewife, attending elementary, junior high, high school, and tertiary education, and suffering from diabetes mellitus for less than 5 years and between 5 to 10 years.

REFERENCES

Damayanti, Santi. (2015). *Diabetes Mellitus and Nursing Implementation* (Diabetes Melitus Dan Pelaksanaan Keperawatannya). 1st ed. Nuha Medika.

Dinas Kesehatan Kabupaten Sukoharjo. (2017). *Health Profile of Sukoharjo District* (Profil Kesehatan Kabupaten Sukoharjo) Tahun 2017."

Dinas Kesehatan Kabupaten Sukoharjo. (2018). *Health Profile of Sukoharjo Regency* (Profil Kesehatan Kabupaten Sukoharjo) Tahun 2018."

Erniantin, Dika, Martini, Ari Udiyono, and Lintang Dian Saraswati. (2018). *Description of the Quality of Life of Patients with Diabetes Mellitus in Members and Non Members of the Diabetes Community at the Ngrambe Health Center* (Gambaran Kualitas Hidup Penderita Diabetes Melituspada Anggota Dan Non Anggota Komunitas Diabetes Di Puskesmas Ngrambe). *Jurnal Kesehatan Masyarakat (e-Journal)* 6(1):215–24.

Haskas, Yusran and Sitti Nurbaya.(2019). *Efforts to Improve the Quality of Life of DM Patients by Providing*

Diabetes Exercise Training (Upaya Peningkatan Kualitas Hidup Penderita DM Dengan Memberikan Pelatihan Senam Diabetes). 1(1):23–29. https://doi.org/10.35892/community.v1i1.15

Hayes, Alison, Hisatomi Arima, Mark Woodward, John Chalmers, Neil Poulter, Pavel Hamet, and Philip Clarke. (2016). *Changes in Quality of Life Associated with Complications of Diabetes: Results from the ADVANCE Study* ("Perubahan Kualitas Hidup Terkait Komplikasi Diabetes: Hasil Studi ADVANCE) *Value in Health* 19(1):36–41. https://doi.org/10.1016/j.jval.2015.10.010

Herdianti, Herdianti. (2017). *Determinants of Quality of Life for Type 2 DM Patients at Ajjappange Hospital* (Determinan Kualitas Hidup Penderita Dm Tipe 2 Di Rsud Ajjappange). *Jurnal Endurance* 2(1):74. https://doi.org/10.22216/jen.v2i1.1662

Isnaini, Nur. 2018. R*isk Factors Affecting Type Two Diabetes Mellitus Risk Factors Was Affects of Diabetes Mellitus Type 2* (Faktor Risiko Mempengaruhi Kejadian Diabetes Mellitus Tipe Dua Risk Factors Was Affects of Diabetes Mellitus Type 2). 14(1):59–68. https://doi.org/10.31101/jkk.550

Kirana, Indah Sasi and Agus Budiman.(2016). *Quality of Life of Type II Diabetes Mellitus Patients in Prolanis Participants at the Moch Health Center* (Kualitas Hidup Penderita Diabetes Mellitus Tipe II Peserta Prolanis Di Puskesmas Moch). Ramdhan Bandung Quality of Life in Prolanis Participants with Type II Diabetes Mellitus at Puskesmas Diet Sebagai Dasar Utama Pengendalian Kadar Gula Dalam Darah , Pen." *Prosiding Psikologi.Issn:2460-6448.* (2):424–29.

Meidikayanti, Wulan and Chatarina Umbul Wahyuni. (2017). *Relationship between Family Support and Quality of Life with Type 2 Diabetes Mellitus at the Pademawu Health Center* (Hubungan Dukungan Keluarga Dengan Kualitas Hidup Diabetes Melitus Tipe 2 Di Puskesmas Pademawu). *Jurnal Berkala Epidemiologi* Volume 5 N(July):240–52.

Ningtyas, Dwi Wahyu, dr. Pudjo Wahyudi, and Irma Prasetyowati. (2013). *Analysis of the Quality of Life of Type 2 Diabetes Mellitus Patients at Bangil Hospital, Pasuruan Regency* (Analisis Kualitas Hidup Pasien Diabetes Melitus Tipe 2 Di RSUD Bangil Kabupaten Pasuruan). *Artikel Ilmiah Hasil Penelitian Mahasiswa.*

Nugroho, Septian Adi and Okti Sri Purwanti.(2010). *The Relationship Between Stress Levels and Blood Sugar Levels in Diabetes Mellitus Patients in the Working Area of the Sukoharjo 1 Health Center, Sukoharjo Regency* (Hubungan Antara Tingkat Stres Dengan Kadar Gula Darah Pada Pasien Diabetes Melitus Di Wilayah Kerja Puskesmas Sukoharjo 1 Kabupaten Sukoharjo).

PERKENI. 2015. *Consensus on Management and Prevention of Type 2 Diabetes Mellitus in Indonesia* (Konsensus Pengelolaan Dan Pencegahan Diabetes Melitus Tipe 2 Di Indonesia)

Rahayuningsih, Faizah Betty.(2013). *Public Mothers In The Miri Sragen Puskesmas Area.* (Ibu Nifas Di Wilayah Puskesmas Miri Sragen). 37–40.

Riskesdas, Kemenkes. 2018. *Main Results of Basic Health Research (RISKESDAS)* (Hasil Utama Riset Kesehata Dasar (RISKESDAS)." 44(8):1–200.

Rwegerera, Godfrey Mutashambara, Thato Moshomo, Marea Gaenamong, Taibat Aderonke Oyewo, Sivasomnath Gollakota, Yordanka Piña Rivera, Anthony Masaka, Brian Godman, Meshack Shimwela, and Dereje Habte.(2018). *Health-Related Quality of Life and Associated Factors among Patients with Diabetes Mellitus in Botswana ("Kualitas Hidup Terkait Kesehatan dan Faktor Terkait di antara Pasien Diabetes Mellitus di Botswana). Alexandria Journal of Medicine* 54(2):111–18. https://doi.org/10.1016/j.ajme.2017.05.010

Setiyorini, Erni and Ning Arti Wulandari. (2017). *Relationship of Old Suffering and Complications with the Quality of Life of Elderly Patients with Type 2 Diabetes Mellitus* (Hubungan Lama Menderita Dan Kejadian Komplikasi Dengan Kualitas Hidup Lansia Penderita Diabetes Mellitus Tipe 2). *Jurnal Ilmu Kesehatan* 4(2):7.

Smeltzer, Susan C. and Bare. (2014) *Brunner Suddarth's 12th Edition Medical Surgical Nursing Book* (Buku Keperawatan Medikal Bedah Edisi 12 Brunner Suddarth). Jakarta: ECG. https://doi.org/10.32831/jik.v4i2.84

Suciana, Fitri and Danang Arifianto. (2019). *Management Of The 5 Pillars Of Dm Control On The Quality Of Life Of Type 2 Dm Patients. Introduction* (Penatalaksanaan 5 Pilar Pengendalian Dm Terhadap

Kualitas Hidup Pasien Dm Tipe 2 Kata Kunci : Kualitas Hidup , Diabetes Melitus Management 5 Pillar Dm Control Of Quality Of Life Of Dm Type 2 Patients Pendahuluan). 9(4):311–18.

Sukardji, K. (2009). *Nutrition Management in Integrated Diabetes Mellitus, In the Book of Integrated Diabetes Mellitus Management* (Penatalaksanaan Gizi Pada Diabetes Melitus Terpadu, Dalam Buku Penatalaksanaan Diabetes Melitus Terpadu). 2nd ed. Jakarta: Fakultas Kedokteran Universitas Indonesia.

Teli, Margaretha. (2017) "*Quality of Life of Patients with Type 2 Diabetes Mellitus at Community Health Centers in Kupang City* (Kualitas Hidup Pasien Diabetes Melitus Tipe 2 Di Puskesmas Se Kota Kupang). *Kesehatan* 15(1):119–34.

Timar, Romulus, Iulian Velea, Bogdan Timar, Diana Lungeanu, Cristian Oancea, Deiana Roman, and Octavian Mazilu. (2016) *Factors Influencing the Quality of Life Perception in Patients with Type 2 Diabetes Mellitus* (Faktor-Faktor Yang Mempengaruhi Persepsi Kualitas Hidup Pada Penderita Diabetes Mellitus Tipe 2). *Patient Preference and Adherence* 10(December):2471–77. https://doi.org/10.2147/PPA.S124858

Tyas, M. D. .. (2008). *Relationship between self-care and perception of pain with quality of life of patients with type 2 diabetes mellitus in the context of nursing in the city of Blitar* (Hubungan Perawatan Diri Dan Persepsi Sakit Dengan Kualitas Hidup Pasien Diabetes Melitus Tipe 2 Dalam Konteks Keperawatan Di Kota Blitar). 36.

Wahyuni, Pitra and Gisely Vionalita. (2018) *Description of the Quality of Life of Type II DM Patients at Tarakan Hospital, Central Jakarta in 2018* (Gambaran Kualitas Hidup Pasien DM Tipe II DI RSUD Tarakan Jakpus Tahun 2018). 11(2):63–66.

Wicaksono, Susaky and Nuniek Nizmah Fajriyah. (2018). *The Correlation of Activeness in Prolanis Clubs to Improving the Quality of Life of Type 2 Diabetes* (Hubungan Keaktifan Dalam Klub Prolanis Terhadap Peningkatan Kualitas Hidup Diabetisi Tipe 2). *Jurnal Ilmiah Kesehatan (JIK)* 11(1).

Widyasari, Nina. (2017). *Relationship of Respondent's Characteristic with The Risk of Diabetes Mellitus and Dislipidemia at Tanah Kalikedinding Nina* (Hubungan Karakteristik Responden dengan Risiko Diabetes Mellitus dan Dislipidemia di Tanah Kalikedinding Nina). *Jurnal Berkala Epidemologi* 5 Nomor 1. https://doi.org/10.20473/jbe.v5i1.2017.130-141