

## Self-Management and Quality of Life in Diabetic Type II Patients at Mataram University Hospital

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**Abstract:** Type 2 diabetes mellitus (DM) is the community's most common metabolic disease, indicated by increased blood glucose. Patients with type 2 DM cannot be cured but can be controlled by self-management. Self-management improves the quality of life (QoL) by increasing the quality of metabolic control and reducing the risk of hospitalization and mortality complications of type 2 DM. This study aims to examine the relationship between self-management and the QoL among patients with type 2 DM at the Mataram University Hospital. This study used a cross-sectional analytic method, and the population included outpatients with type 2 DM in Mataram University Hospital. This study employed 40 people selected by the consecutive sampling method and got interviewed to fill out the Diabetes Self-Management Questionnaires (DSMQ) and Asian Diabetes Quality of Life (Asian DQOL) questionnaires. The data analysis used the Spearman statistical test. The majority of the self-management respondents were good (87.5%), and the QoL (95%). The results obtained a p-value of 0.000 ( $p < 0.05$ ), indicating a significant relationship between self-management and the QoL of type 2 DM patients in Mataram University Hospital. This result showed that the better the self-management of type 2 DM patients is, the better their QoL will be.

**Keywords:** diabetes mellitus type II; quality of life; self-management

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### INTRODUCTION

Diabetes mellitus (DM) is a metabolic disease characterized by increased glucose levels in the blood. Type 2 DM is the most common type in society, with the condition of the patient's body experiencing insulin resistance.<sup>1</sup> Diabetes became the direct cause of 1.5 million deaths worldwide in 2019.<sup>2</sup> In 2021, 537 million adults experienced diabetes worldwide. There were 19.4 million sufferers in Indonesia, which increased compared to 2019, with 10.4 million DM sufferers in Indonesia. In 2021, 6.7 million deaths worldwide of people with DM were due to complications unrelated to COVID-19.<sup>3</sup> The number of adults aged  $\geq 15$  years who experienced DM in West Nusa Tenggara in 2020 was 59,606. Meanwhile, in Mataram City, in 2020, 3,588 people suffered from DM.<sup>4</sup>

Self-management is the ability of daily management in individuals with chronic diseases to identify and solve problems related to their health conditions, daily behaviors, and emotional state.<sup>5</sup> Self-management behavior is a critical strategy in type 2 DM management as it can improve the quality of metabolic control and reduce the risk of hospitalization and mortality complications.<sup>6</sup> Health-related quality of life (QoL) is used to assess life changes related to disease, injury, and treatment that impact the body's inability and daily functioning.<sup>7</sup> People with type 2 DM have heavy pressure on themselves and have a low QoL compared to healthy people. Total recovery cannot be achieved for chronic diseases such as type 2 DM. They can only control their health to avoid worsening conditions. Therefore, the primary purpose of management in type 2 DM patients is to prevent a decrease in the patient's QoL. Knowing risk factors such as depression, non-compliance with treatment, duration of diabetes, insulin use, and other comorbidities is very important to identify a preventive target.<sup>8,9</sup> Prevention can be done by implementing good self-management, as it is known that self-management can improve the QoL of DM sufferers.<sup>10</sup> Based on the results of research conducted by Putri and Solikin and Heriyadi, it was stated that there is a relationship between self-

management and the QoL of type 2 DM patients.<sup>11,12</sup> Solikin added that self-management behavior is important to prevent complications in DM patients. This study aims to examine the relationship between self-management and the QoL among patients with type 2 DM at the Mataram University Hospital. By knowing the relationship between self-management and QoL in DM type 2 patients, this study is expected to provide knowledge to DM type 2 patients and the government as a reference for conducting health interventions in the community. Thus, it can help reduce the incidence of complications and mortality due to DM.

## MATERIAL AND METHOD

This research utilized a cross-sectional design and was conducted at the Mataram University Hospital in March – May 2022 with a population of outpatient type 2 DM sufferers. The samples used were 40 samples with a consecutive sampling technique. This number was taken using a formula for ordinal-ordinal analytic correlation with a 95% confidence interval and 5% alpha. The independent variable was self-management, and the dependent variable was the QoL of people with type 2 DM. Respondents were selected based on the criteria determined in the study, such as respondents who received a diagnosis of type 2 DM >30 years old, not being infected with COVID-19, cooperative, and able to communicate well. In addition, exclusion criteria were also established, such as hospitalized patients and patients with cardiovascular diseases such as stroke, heart disease, and Peripheral Arterial Disease (PAD).

This study used the Diabetes Self-Management questionnaire (DSMQ) and the Asian Diabetes Quality of Life (Asian DQOL) questionnaire. The DSMQ questionnaire was adopted from Schmidt *et al.*<sup>13</sup> This questionnaire has been translated and tested for validity and reliability by Fuadi.<sup>14</sup> The ADQOL questionnaire was adopted from and tested for validity and reliability by Permana.<sup>15</sup> The tests of both questionnaires were valid and reliable. However, the researcher retested the validity and reliability with 30 respondents. Both questionnaires have been declared valid ( $r$  count: 0.372-0.844) and reliable (Cronbach's alpha values: 0.850 and 0.903) from this retest. Data collection was carried out by interviewing the respondent. First, respondents were asked for their willingness to fill out the questionnaire. Then the researcher asked respondents about the statement in the questionnaire and recorded the respondent's answers. Then the answers were converted into 4 points on the Likert scale with a minimum score of 0 and a maximum score of 3 for DSMQ. For the Asian DQOL questionnaire, the answer was converted into 5 points on the Likert scale with a minimum score of 1 and a maximum score of 5. The data analysis was conducted using the spearman correlation test.

## RESULT

### Characteristics of Respondents

Table 1. Characteristics of Respondents

Characteristics	Total (N)	Percentage (%)
<b>Gender</b>		
Male	21	52.5
Female	19	47.5
<b>Age</b>		
30-45 years	7	17.5
46-60 years	18	45
61-75 years	13	32.5
>75 years	2	5
<b>Recent Education</b>		
No formal education	5	12.5
Primary school	7	17.5
Junior High School	2	5
Senior High School	8	20
College	18	45
<b>Duration of Type 2 DM</b>		
<1 years	4	10
1-5 years	25	62.5
6-10 years	5	12.5
11-15 years	3	7.5
>15 years	3	7.5

Based on the data in Table 1, it is known that out of 40 respondents, 52.5% are male, 45% are 46-60 years old, 45% have a recent education in college, and 62.5% have type 2 DM duration in the range of 1-5 years.

### Description of Self-Management

The result of DSMQ was classified into three categories; good (score>32), medium (16 ≤ score ≤ 32), and poor (score<16). Table 2 shows that the DSMQ questionnaire obtained self-management results in the good category of 35 respondents (87.5%). It revealed that the males had self-management in the good category, namely 18 respondents (45%) and followed by the females, as many as 17 respondents (42.5%). The age of 46-60 years had self-management in the good category, namely 15 respondents (37.5%). Based on the results of the study described in table 2, respondents included in the good category had the most recent education in college, namely 16 respondents (40%), followed by high school. The duration of diabetes with a range of 1-5 years had the highest number of respondents in the good category, namely 21 respondents (52.5%).

Table 2. Description of Self-Management

Category	n	%	Category	n	%	Category	n	%
Good	35	87.5	Medium	5	12.5	Poor	0	0
<b>Characteristic</b>			<b>Characteristic</b>			<b>Characteristic</b>		
<b>Gender</b>			<b>Gender</b>			<b>Gender</b>		
Male	18	45	Male	3	7.5	Male	0	0
Female	17	42.5	Female	2	5	Female	0	0
<b>Age</b>			<b>Age</b>			<b>Age</b>		
30-45 years	6	15	30-45 years	1	2.5	30-45 years	0	0
46-60 years	15	37.5	46-60 years	3	7.5	46-60 years	0	0
61-75 years	12	30	61-75 years	1	2.5	61-75 years	0	0
>75 years	2	5	>75 years	0	0	>75 years	0	0
<b>Recent Education</b>			<b>Recent Education</b>			<b>Recent Education</b>		
Without formal education	5	12.5	Without formal education	0	0	Without formal education	0	0
Primary school	6	15	Primary school	1	2.5	Primary school	0	0
Junior High School	2	5	Junior High School	0	0	Junior High School	0	0
Senior High School	6	15	Senior High School	2	5	Senior High School	0	0
College	16	40	College	2	5	College	0	0
<b>Duration of Type 2 DM</b>			<b>Duration of Type 2 DM</b>			<b>Duration of Type 2 DM</b>		
<1 years	4	10	<1 years	0	0	<1 years	0	0
1-5 years	21	52.5	1-5 years	4	10	1-5 years	0	0
6-10 years	4	10	6-10 years	1	2.5	6-10 years	0	0
11-15 years	3	7.5	11-15 years	0	0	11-15 years	0	0
>15 years	3	7.5	>15 years	0	0	>15 years	0	0

### Description of Quality of Life

The result of Asian DQOL was classified into three categories; good (score>77), medium (49 ≤ score ≤ 77), and poor (score<49). Based on the QoL research data using the Asian DQOL questionnaire in table 3, the highest number of results were obtained on the QoL in the good category, namely 38 respondents (95%). Most male respondents had a QoL, with a good category, namely 20 respondents. The respondents of this study had the highest QoL with a good category in the age range of 46-60 years, namely 17 respondents (42.5%). Most respondents with a good QoL were respondents with the last education in college, namely 17 people (42.5%). Most respondents with a long diabetes range of 1-5 years had a good QoL, namely 24 respondents (60%).

Table 3. Description of Quality of Life

Category	n	%	Category	n	%	Category	n	%
Good	38	95	Medium	2	5	Poor	0	0
<b>Characteristic</b>			<b>Characteristic</b>			<b>Characteristic</b>		
<b>Gender</b>			<b>Gender</b>			<b>Gender</b>		
Male	20	50	Male	1	2.5	Male	0	0
Female	18	45	Female	1	2.5	Female	0	0
<b>Age</b>			<b>Age</b>			<b>Age</b>		
30-45 years	6	15	30-45 years	1	2.5	30-45 years	0	0
46-60 years	17	42.5	46-60 years	1	2.5	46-60 years	0	0
61-75 years	13	32.5	61-75 years	0	0	61-75 years	0	0
>75 years	2	5	>75 years	0	0	>75 years	0	0
<b>Recent Education</b>			<b>Recent Education</b>			<b>Recent Education</b>		
Without formal education	5	12.5	Without formal education	0	0	Without formal education	0	0
Primary school	6	15	Primary school	1	2.5	Primary school	0	0
Junior High School	2	5	Junior High School	0	0	Junior High School	0	0
Senior High School	8	20	Senior High School	0	0	Senior High School	0	0
College	17	42.5	College	1	2.5	College	0	0
<b>Duration of Type 2 DM</b>			<b>Duration of Type 2 DM</b>			<b>Duration of Type 2 DM</b>		
<1 years	4	10	<1 years	0	0	<1 years	0	0
1-5 years	24	60	1-5 years	1	2.5	1-5 years	0	0
6-10 years	4	10	6-10 years	1	2.5	6-10 years	0	0
11-15 years	3	7.5	11-15 years	0	0	11-15 years	0	0
>15 years	3	7.5	>15 years	0	0	>15 years	0	0

### The Relationship between Self-Management and Quality of Life

Based on table 4, a significant relationship between self-management and the QoL of respondents was obtained (p-value 0.000), with moderate strength ( $r = 0.535$ ).

Table 4. The Relationship between Self-Management and Quality of Life in Diabetic Type II Patients at Mataram University Hospital

Self-management	Quality of Life						Coefficient Correlation	P-value
	Good		Medium		Poor			
	n	%	n	%	n	%		
Good	34	85	1	2.5	0	0	0.535	0.000
Medium	4	10	1	2.5	0	0		
Poor	0	0	0	0	0	0		

### DISCUSSION

Based on Table 1, 52.5% of respondents were male. It is supported by research conducted by Pratama et al. at RSUP Dr. Mohammad Hosein Palembang, with 54% male respondents.<sup>16</sup> Based on the IDF in 2021, the incidence rate in men was 17.7 million higher than in women.<sup>17</sup> It happens because, in men, insulin is less secreted than in women due to the hormone estrogen, which stimulates insulin production and provides a protective effect on the pancreas from metabolic damage such as oxidative stress. In addition, changes in body composition in men cause an increase in fat in the visceral part, such as in the liver or heart muscle, which will increase the accumulation of ectopic fat and can cause insulin resistance and inflammation in peripheral areas so that the risk of type 2 DM increases.<sup>18,19</sup> This study revealed that most respondents aged 46-60 years were 18 respondents (45%). Increasing age will increase the disruption of the work of pancreatic beta cells, which can cause an increase in insulin resistance.<sup>20</sup> The study also displayed that the most respondents with the last education in higher education were 18 (45%). Higher education considers having high knowledge, making it easier for individuals to make decisions and receive treatment to overcome their health problems by self-managing DM.<sup>12</sup> The duration of diabetes with a range of 1-5 years had the highest number of respondents, namely 25 respondents (62.5%). For a longer period, sufferers suffering from type 2

DM will get a great opportunity to learn and become more experienced in overcoming problems arising from their illness.<sup>21</sup>

### **Self-Management Description**

Based on the study's results, it was found that most respondents had self-management in the good category (87.5%). This data showed that most of the respondents at Mataram University Hospital have been able to do good self-management in managing type 2 DM by regulating their diet and physical activity or conducting examinations to control blood sugar. Individuals with a higher knowledge of type 2 DM will have a good impact on the progress of the disease and can help reduce complications.<sup>22</sup> It supports the study results that most respondents had their last education in college (45%). Table 2 shows that the most recent college-educated respondents have good self-management. In Table 2, 37.5% of respondents in the good category were 46-60 years old. People with type 2 DM under the age of 65 enjoyed treatment more and used health facilities.<sup>23</sup> Furthermore, based on the study's results, it was found that the duration of diabetes with a range of 1-5 years had the highest number of respondents in the good category (52.5%). Patients who experienced type 2 DM longer found it easier to make decisions as they had more opportunities to understand what should be done and were more experienced in overcoming the problems they experienced.<sup>21</sup>

### **Quality of Life Overview**

The study's results revealed that most respondents had a good category in QoL (95%). This result showed that people with diabetes mellitus at Mataram University Hospital were satisfied with their physical, emotional, and social aspects to coexist with type 2 DM. Table 3 displays that from this study, 42.5% of respondents with a good QoL were respondents with the last education in higher education. Individuals with high knowledge will certainly make it easier to solve problems so that they will feel satisfied with the decisions taken<sup>24</sup>. People with diabetes who received education about diabetes and self-management had a better QoL.<sup>25</sup> Table 3 demonstrates that the duration of diabetes with a range of 1-5 years had the most QoL respondents with a good category (60%). The longer diabetes suffers will reduce the QoL due to an increased risk of complications and a higher probability of uncontrolled sugar.<sup>26</sup> Table 3 shows that most respondents with a good QoL are 40-60 years old (42.5%). People with type 2 DM who are less than 65 years old have a good QoL.<sup>23</sup> At this age, sufferers enjoy undergoing treatment more and use health facilities. In addition, they have a more optimistic view of themselves.

### **The Relationship between Self-Management and Quality of Life**

Based on the results of the study, there was a significant relationship ( $p$ -value  $0.000 < 0.05$ ) so that the hypothesis ( $H_0$ ) was rejected, with moderate strength ( $r$  0.535) and led positively between self-management and the QoL of respondents with DM at Mataram University Hospital. Furthermore, the result showed a relationship where the better the self-management of people with type 2 DM is, the better the sufferer's QoL will be. It can be seen in Table 4 of the cross-tabulation results of respondents at Mataram University Hospital. It displayed that the respondents mostly had good self-management with good quality (85%). Implementing good and consistent self-management will increase the QoL of DM sufferers due to controlled blood sugar and a decreased risk of complications.<sup>27,28</sup> Accomplishing short-term goals of DM management, such as improving the QoL and reducing the risk of complications, will help reduce DM mortality.<sup>29</sup>

However, there are some limitations in this study. Data collection was carried out by conducting interviews and required the contribution of respondents in remembering their habits in the last two months. Thus, bias can happen when respondents recall their memory incorrectly. In addition, the answer by respondents to a questionnaire is subjective, and the language used in the DSMQ questionnaire is not common in society.

## **CONCLUSION**

Based on the results of the spearman correlation test, it was found that there was a significant relationship between self-management and the QoL of people with type 2 DM at Mataram University Hospital. Higher self-management implies a better quality of life. The suggestion for future research is to expand the research area and number of samplings by taking several health centers that can represent an area. In addition, it is recommended for the government use this study as a reference for conducting health interventions in the community, such as posters or health campaign.

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## CONFLICT OF INTEREST

There is no conflict of interest.

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