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The Relationship between Blood Glucose Levels and Dietary Commitment to Self-Motivation in Patients with Type 2 Diabetes Mellitus

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ABSTRACT
Diabetes Mellitus is a metabolic disorder involving dysfunction of the pancreas, resulting in insulin's inability to effectively convert blood glucose into energy. Type 2 Diabetes Mellitus is often caused by obesity and unhealthy dietary habits, making dietary regulation essential for lowering blood sugar levels. Adherence to a recommended diet requires strong motivation, which serves as a key support system. Without sufficient motivation, maintaining dietary commitment becomes challenging. This commitment refers to a person's willingness to follow the treatment regimen as advised by healthcare professionals. The aim of this study was to determine the relationship between blood glucose levels and diet commitment in relation to self-motivation among patients with Type 2 Diabetes Mellitus. This research employed a quantitative approach with a cross-sectional design. The results of the Spearman Rho test showed a p-value = 0.000 (< 0.05), indicating a significant relationship between self-motivation and diet commitment toward blood glucose levels in patients with Type 2 Diabetes Mellitus. It can thus be concluded that there is a correlation between blood glucose levels and diet commitment as influenced by self-motivation in these patients.

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INTRODUCTION

Motivation is an internal energy shift within a person that triggers emotions and reactions to achieve goals desired by the individual (Soelistiyo, 2021). An individual's attitude and behavior in maintaining their health are also influenced by self-motivation, particularly in practicing a healthy lifestyle. Without motivation, individuals with Diabetes Mellitus (DM) often fail to comply with dietary regulations in their daily eating habits (Sutjipto & Novanra, 2020).

A person with DM must have a strong commitment and consistency in undergoing treatment. Without self-awareness and adherence to proper eating behavior, treatment may fail, leading to health deterioration. Non-pharmacological efforts such as diet and physical activity (e.g., exercise) can also help manage DM (Damayanti et al., 2023). To control blood

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glucose levels, individuals with DM must undergo effective dietary therapy, which depends heavily on their motivation. Without adequate motivation, it becomes difficult for patients to meet dietary goals.

According to Nurmala and Khairil (2021), motivation serves as a major support system in implementing dietary therapy for DM. Managing diet in DM patients is challenging and often leads to boredom due to many food restrictions, which may cause non-compliance. Individuals tend to be more motivated to perform specific tasks if they have a clear goal, making motivation essential (Febriana & Fayasari, 2023).

The World Health Organization (2023) predicts an increase of 21.3 million DM cases globally by 2030. In 2021, there were 537 million people worldwide with DM, decreasing to 422 million in 2022. The International Diabetes Federation (IDF) reported that in 2023, the number of DM cases in Indonesia reached 7.8 million, a sharp rise from 41.8 million in 2022 and 19.47 million in 2021.

Data from the Banjarmasin City Health Office (2023) show that there were 516 reported cases of DM in Banjarmasin in 2022, 6,838 in 2021, and a significant increase to 15,748 in 2023. In the Pekauman Health Center area alone, 1,270 individuals were diagnosed with Type 2 Diabetes Mellitus in 2023.

In DM patients, two primary insulin-related problems occur: insulin resistance and impaired insulin secretion. Normally, insulin binds to specific receptors on cell surfaces, initiating glucose metabolism within cells. In insulin resistance, intracellular responses are diminished, rendering insulin ineffective in stimulating glucose uptake. Several factors may contribute to insulin resistance, including genetics, age (resistance tends to increase over age 65), obesity, family history, and certain ethnic groups such as Hispanics and Native Americans (American Diabetes Association, 2023).

Two main factors influence an individual's blood glucose level: endogenous factors (e.g., insulin, glucagon, cortisol) that act as receptor systems in liver and muscle cells, and exogenous factors such as the amount and type of food consumed. Blood glucose levels are also affected by personal characteristics (gender, family history, age, and unhealthy dietary habits, such as excessive consumption of carbohydrates and high-glucose foods), which can raise glucose levels (Nurhaliza et al., 2021). Strong motivation significantly improves treatment adherence and is essential in maintaining balanced glucose levels and minimizing complications (Prasetya et al., 2023).

Preventive actions for Type 2 DM include managing diet, food composition, calorie needs, food types, and meal timing (Diani et al., 2023). A proper diet consists of staple foods, protein sources, fruits, and vegetables, all consumed in appropriate portions (Arditiya et al., 2022).

Maintaining stable blood glucose levels requires dietary adjustments, including proper meal scheduling, appropriate food quantity, and suitable food types. A major factor influencing blood sugar levels is dietary changes from high-fat fast food, sweet foods (e.g., cakes, chocolate), and preserved foods (e.g., salted fish, salted eggs) (Nurmala et al., 2021).

Effective management of blood glucose in DM includes five strategies: education, nutritional therapy, physical exercise, and non-pharmacological therapy. Education aims to

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improve knowledge, attitudes, and clean and healthy living behavior. Maintaining an ideal body weight by balancing calorie intake and physical activity, along with regular glucose monitoring, are crucial preventive measures (Purnama, 2023).

A preliminary study conducted on Thursday, February 22, and Tuesday, February 27, 2024, at Pekauman Health Center, Banjarmasin, involved interviews with 10 patients with Type 2 DM. Four patients showed strong self-motivation in dietary regulation, knowing which foods to consume and avoid. However, six patients admitted that while they were aware of the recommended diet, they continued to consume foods that should be limited.

METHODS

This study employed a quantitative research approach using a cross-sectional design.
Independent variable (X): Self-motivation
Dependent variables (Y):

1. Diet Commitment
2. Blood Glucose Levels

The population of this study consisted of 229 patients with Type 2 Diabetes Mellitus at Pekauman Health Center in Banjarmasin. The sample included patients diagnosed with Type 2 Diabetes Mellitus at the same health center, with a total population of 229 individuals. The sampling technique used in this study was purposive sampling, involving 108 respondents. These samples were selected from Type 2 Diabetes Mellitus patients who came for routine check-ups at the Pekauman Health Center in Banjarmasin. The aim of this study was to determine the relationship between blood glucose levels and diet commitment in relation to self-motivation among patients with Type 2 Diabetes Mellitus.

RESULTS AND DISCUSSION

Respondent Characteristics Based on Age

Table 1. Respondent Characteristics Based on Age

No	Age	Total	
		Frequency	Percentage
1	19-59 years	83	76.9%
2	>60 years	25	23.1%
	Total	108	100%

Table 1 shows the frequency distribution of respondents by age. Based on the table, the majority of respondents were adults aged 19–59 years, totaling 83 individuals (76.9%).

Respondent Characteristics Based on Gender

Table 2. Respondent Characteristics Based on Gender

No	Gender	Total	
		Frequency	Percentage
1	Male	36	33.3%
2	Female	72	66.7%
	Total	108	100%

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Table 2 shows the frequency distribution of respondents by gender. According to the table, the majority of respondents at Pekauman Health Center were female, totaling 72 individuals (66.7%), while male respondents numbered 36 (33.3%).

Respondent Characteristics Based on Education Level

Table 3. Respondent Characteristics Based on Education Level

No	Education Level	Total	
		Frequency	Percentage
1	No schooling	6	5.6%
2	Elementary School (SD)	24	22.2%
3	Junior High School (SMP)	38	35.2%
4	Senior High School (SMA)	38	35.2%
5	Diploma (D3)	2	1.9%
	Total	108	100%

Based on Table 3, the highest number of respondents had completed Junior High School and Senior High School, with 38 individuals each (35.2%).

Respondent Characteristics Based on Duration of Having Diabetes Mellitus

Table 4. Respondent Characteristics Based on Duration of Having Diabetes Mellitus

No	Duration of Having Diabetes Mellitus	Total	
		Frequency	Percentage
1	1-5 years	77	71.3%
2	6-10 years	27	25.0%
3	11-15 years	2	1.9%
4	>60 years	2	1.9%
	Total	108	100%

Table 4 shows the frequency distribution of respondents by duration of diabetes. The table indicates that most respondents at Pekauman Health Center had been living with diabetes for 1–5 years (71.3%).

Respondent Characteristics Based on Other Diseases

Table 4. Respondent Characteristics Based on Other Diseases

No	Other Diseases	Total	
		Frequency	Percentage
1	Anemia	1	0.9%
2	Gout	5	4.6%
3	Hypertension	37	34.4%
4	High Cholesterol	15	13.9%
5	Rheumatism	5	4.6%
6	Gastritis	4	3.7%
7	Heart diseases	1	0.9%
8	Asthma	2	2.8%
9	Scabies	1	0.9%
10	Osteoarthritis	1	0.9%

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No	Other Diseases	Total	
		Frequency	Percentage
11	None	35	32.3%
	Total	108	100%

Table 5 shows the frequency distribution of respondents based on the presence of other diseases. According to the table, the most common comorbidity was hypertension, reported by 37 respondents (34.4%).

Self-Motivation

Table 6. Self-Motivation

No	Self-Motivation	Total	
		Frequency	Percentage
1	High Motivation	56	51.9%
2	Low Motivation	52	48.1%
	Total	108	100%

Dietary Commitment

Table 7. Dietary Commitment

No	Dietary Commitment	Total	
		Frequency	Percentage
1	Committed	52	48.1%
2	Not Committed	56	51.9%
	Total	108	100%

Random Blood Glucose Levels

Table 8. Random Blood Glucose

No	Random Blood Glucose	Total	
		Frequency	Percentage
1	Hypoglycemia	0	0%
2	Normal	52	48.1%
3	Hyperglycemia	56	51,9%
	Total	108	100%

Self-Motivation and Dietary Commitment

Table 9. Self-Motivation and Dietary Commitment

Self Motivation	Dietary Commitment				$\sum$	%
	Not Committed		Committed			
	F	%	F	%		
High Motivation	2	3.8%	50	89.3%	52	48.1
Low Motivation	50	96.2%	6	10.7%	56	51.9
Total					108	100
p-value = 0.000						
Correlation Coefficient = 0.854						

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Self-Motivation and Blood Glucose Levels

Table 10. Self-Motivation and Blood Glucose Levels

Self Motivation	Blood Glucose Levels								∑	%
	Hypoglycemia		Normal		Hyperglycemia					
	F	%	F	%	F	%	F	%		
High Motivation	56	51.9	0	0	50	89.3	6	10.7%	52	48.1
Low Motivation	52	48.1	0	0	2	3.8	50	96.2%	56	51.9
Total									108	100
p-value = 0.000										
Correlation Coefficient = 0.854										

Dietary Commitment and Blood Glucose Levels

Table 11. Dietary Commitment and Blood Glucose Levels

Dietary Commitment	Blood Glucose Levels								∑	%
	Hypoglycemia		Normal		Hyperglycemia					
	F	%	F	%	F	%	F	%		
Committed	52	48.1	0	0	51	98.1	1	1.9%	52	48.1
Not Committed	56	51.9	0	0	1	1.8	55	98.2%	56	51.9
Total									108	100
p-value = 0.000										
Correlation Coefficient = 0.965										

Discussion

Self-Motivation and Dietary Commitment among Patients with Type 2 Diabetes Mellitus

Based on Table 9, the results of the study on self-motivation and dietary commitment among patients with Type 2 Diabetes Mellitus in the Pekauman Public Health Center Work Area, Banjarmasin, showed that 50 respondents (89.3%) with high motivation had strong dietary commitment, while 2 respondents (3.8%) with high motivation showed poor dietary commitment.

Nurhidayati (2024) stated that the duration of having diabetes can affect both motivation and adherence. Patients who have had diabetes for a longer period tend to have lower motivation compared to those who have been recently diagnosed. Long-term diabetic patients also tend to neglect recommended dietary practices due to boredom. The lower the patient's motivation, the lower the level of dietary adherence. Respondents with strong self-motivation are more likely to follow and comply with dietary programs recommended by healthcare professionals.

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Based on this statement, the researcher assumes that changes in motivation and commitment may be influenced by the length of time the patient has had diabetes mellitus. The longer the patient follows a dietary regimen, the more likely they are to experience fatigue due to continuous food restrictions.

These results are in line with the study by Fikriyah et al. (2022), which found that individuals are more motivated to carry out certain tasks when they have clear goals. Internal motivation is influenced by two major factors: external stimuli (such as environment, culture, habits, and economy) and internal factors (such as attention, perception, motivation, suggestion, etc.) that respond to external stimuli. Therefore, a person's internal factors can significantly affect their motivation to achieve specific goals.

Self-Motivation and Blood Glucose Levels among Patients with Type 2 Diabetes Mellitus

Based on Table 10, the study on self-motivation among patients with Type 2 Diabetes Mellitus in the Pekauman Public Health Center Work Area, Banjarmasin, revealed that most respondents (56 people or 51.8%) had high motivation, while 52 people (48.1%) had low motivation. Additionally, 6 respondents had high motivation despite experiencing hyperglycemia.

Self-motivation generally originates from within the individual, although it can be influenced by many factors. In principle, individuals with high motivation will strive to achieve their goals. For instance, patients who are required to undergo treatment will be mentally driven to adhere to the treatment regimen. This motivation is then reflected in their actions. If successful, they will feel satisfied. Respondents with good motivation tend to demonstrate positive behavior and confidence in carrying out certain efforts (Syaftriani et al., 2023).

According to the study, the majority of diabetes mellitus patients were female, accounting for 72 individuals (66.7%). This indicates that women tend to be more affected by diabetes. Among them, six respondents with high motivation still had hyperglycemia. Based on questionnaire responses, they reported frequent consumption of sweet foods and drinks. This is consistent with the findings of Tarmizi (2024), who stated that individuals who frequently consume sugary foods and beverages have a higher risk of developing hyperglycemia compared to those who do not. These foods and drinks typically contain simple carbohydrates or glucose with high glycemic indexes, which rapidly increase blood glucose levels after meals. A high-glucose diet also contributes to obesity, thereby increasing the risk of diabetes.

Based on these findings, the researcher assumes that women are more likely to have diabetes because they generally prefer sweet foods and beverages. As known, such foods and drinks contain high levels of sugar, which can cause blood glucose levels to rise quickly.

This study is supported by Febriana (2023), who reported a significant correlation between self-motivation and blood glucose levels. Higher motivation is associated with better adherence to dietary goals. Conversely, lower motivation is linked to poorer dietary compliance. Health behaviors can be improved through internal motivation to engage in safe and healthy practices. Without food-related motivation, eating behavior can become disrupted, making it difficult to maintain a healthy diet and stable blood glucose levels.

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Dietary Commitment and Blood Glucose Levels in Patients with Type 2 Diabetes Mellitus

Based on Table 11, the results of the study on dietary commitment among patients with Type 2 Diabetes Mellitus in the Pekauman Public Health Center Work Area, Banjarmasin, showed that out of 108 respondents, 52 individuals (48.1%) were committed to their diet, while 56 individuals (51.8%) were not.

According to Nasution (2020), a person's memory is influenced by factors such as age, which plays a role in mental maturity and the ability to think and act. Adherence is generally defined as the extent to which a person's behavior in taking medication, following a diet, and implementing lifestyle changes corresponds with healthcare providers' recommendations. A person with diabetes mellitus is considered compliant if the amount, type, and timing of their food intake align with medical advice. Thus, patients can be categorized as adherent when they follow recommendations regarding the quantity, quality, and schedule of their meals. Dietary adherence is strongly influenced by motivation (Putri et al., 2020).

Based on this statement and field observations, the researcher assumes that the factors contributing to non-adherence to dietary recommendations among patients with diabetes mellitus include age and education level. Elderly individuals and those with limited education tend to show lower compliance with dietary guidelines.

This finding is consistent with the study by Maghfiroh (2023), which stated that patients who adhere to dietary patterns tend to have better glycemic control. Continuous good glycemic control can prevent acute complications and reduce the risk of long-term complications. Improved glycemic control is associated with a lower risk of retinopathy, nephropathy, and neuropathy. On the contrary, non-adherence to dietary guidelines leads to poor or uncontrolled glycemic control, which increases the risk of complications.

Dietary adherence refers to the discipline in managing food and beverage intake daily for individuals with diabetes mellitus to maintain health and accelerate recovery. Dietary compliance is heavily influenced by the "3J" principles—timing (jadwal), quantity (jumlah), and type (jenis) of food. Additionally, the implementation of a dietary program must adhere to specific requirements, such as limiting or reducing high-sugar and high-carbohydrate foods and beverages, eating according to a set schedule, and consuming high-protein, healthy foods. If dietary adherence is not maintained, blood glucose levels will become difficult to control (Pranoto and Rusman, 2022). This is supported by a study from Widodo (2017), which found that non-compliance with dietary therapy among diabetes patients is often due to a lack of understanding about the benefits of the diet.

Blood Glucose Levels in Patients with Type 2 Diabetes Mellitus

The results of the study on blood glucose levels among patients with Type 2 Diabetes Mellitus in the Pekauman Public Health Center Work Area, Banjarmasin, showed that out of 108 respondents, 56 individuals (51.8%) had hyperglycemia, while 52 individuals (48.1%) had normal blood glucose levels.

Blood glucose refers to the concentration of sugar in the blood, which is tightly regulated and serves as the body's main energy source. Normal blood glucose levels range from 70–200 mg/dL. Hypoglycemia is defined as blood sugar below 70 mg/dL, and hyperglycemia as above 200 mg/dL. During and after eating or drinking, blood glucose levels

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rise, prompting the pancreas to work harder to produce insulin, which prevents excessive increases in blood glucose and gradually lowers the level (Rosares & Boy, 2022).

Based on this information, the researcher assumes that the higher a person's motivation, the better their dietary adherence and blood glucose outcomes. A study by Atam (2023) also found that blood glucose levels are influenced by both internal and external factors. Internal factors include stress, obesity, diet, exercise, insulin use, blood glucose monitoring, and age. It can be concluded that dietary adherence is a form of positive behavioral change that contributes to faster and better-controlled recovery.

The Relationship Between Self-Motivation and Dietary Commitment on Blood Glucose Levels

In Patients with Type 2 Diabetes Mellitus in the Working Area of Pekauman Public Health Center, Banjarmasin, the results of statistical analysis using the Spearman Rank test showed a significance value of 0.000, which is less than 0.05 (p-value < α), indicating that there is a statistically significant relationship between self-motivation and dietary commitment in relation to blood glucose levels in patients with Type 2 Diabetes Mellitus in the working area of Pekauman Public Health Center, Banjarmasin.

The relationship among these three variables shows a positive correlation with a Spearman correlation coefficient of 0.854, indicating a very strong association. There were 52 respondents with high motivation and 56 respondents with strong dietary commitment. Motivation and commitment greatly influence adherence to the recommended diet; the higher the motivation and commitment, the better the blood glucose control in patients with diabetes mellitus.

This finding is consistent with a study by Kumala (2021) entitled "The Relationship Between Self-Motivation and Dietary Compliance in Patients with Diabetes Mellitus at the Kotamobagu Wound Care Center Clinic." The study found a significant relationship between self-motivation and dietary adherence in patients with diabetes mellitus. The results showed that some respondents were still not motivated to follow a diet due to their continued consumption of foods that elevate blood glucose levels, such as high-carbohydrate foods. The better the motivation, the higher the level of dietary compliance. Conversely, lower motivation is associated with poorer dietary adherence. Respondents with strong self-motivation were more likely to comply with and follow dietary programs as recommended by healthcare providers.

The findings of this study, which reveal a strong correlation between self-motivation, dietary commitment, and blood glucose levels in patients with Type 2 Diabetes Mellitus, are supported by the study conducted by Saputri and Negara (2024), which implemented self-care management based on Orem's theory. Their case study demonstrated a significant improvement in patients' knowledge and self-care practices after a 10-day educational intervention that included guidance on proper diet, physical activity, medication adherence, blood glucose monitoring, and foot care. This intervention led to a notable reduction in blood glucose levels by 64 mg/dl, highlighting the critical role of education and motivational support in enhancing patient compliance with self-management practices. Actively involving patients through education based on nursing theory not only fosters internal motivation but also has a direct impact on glycemic control, reinforcing the current study's conclusion that higher

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motivation is associated with stronger dietary commitment and better-controlled blood glucose levels.

Innovative health education strategies also play a crucial role in promoting self-care behaviors among patients with Type 2 Diabetes Mellitus. Negara et al. (2024) demonstrated the effectiveness of digital media—specifically, Animaker and Augmented Reality (AR)—in enhancing diabetic foot care education. Their study revealed that patients who received foot care education through these interactive media exhibited significantly improved preventive behaviors to avoid ulcer complications. This underscores the transformative potential of digital tools in engaging patients and reinforcing complex health messages in a more accessible and memorable way. By leveraging visual and immersive technology, patients not only understood the importance of foot hygiene and early warning signs but also developed greater motivation to implement these practices consistently. These findings support the integration of modern educational interventions with traditional care models to enhance patient outcomes, especially in chronic disease management where long-term adherence is essential.

In addition to motivational and physiological aspects, the psychological constructs of health behavior also play a pivotal role in dietary compliance among individuals with Type 2 Diabetes Mellitus. Tajaruddin et al. (2024), using the Health Action Process Approach (HAPA) model, demonstrated that risk perception, outcome expectancies, task self-efficacy, and behavioral intention significantly correlated with dietary compliance. Their findings revealed that patients with higher levels of perceived risk and expected positive outcomes were more likely to adhere to dietary recommendations. Furthermore, task self-efficacy showed a very strong correlation ($r = 0.800$), highlighting the importance of confidence in one's ability to perform diabetes-related self-care tasks. Similarly, intention was also strongly linked ($r = 0.887$) with dietary adherence, underscoring the critical role of goal-directed motivation. These insights suggest that effective interventions should not only focus on improving knowledge or physiological monitoring but also enhance patients' cognitive perceptions and motivational states to reinforce sustainable dietary behavior.

In addition to psychosocial and behavioral factors, the interplay of physiological and demographic risk factors remains central in understanding the onset of Type 2 Diabetes Mellitus. A study by Negara (2023) at Banjarmasin Hospital highlighted that while gender, hypertension, and obesity showed no statistically significant association with the incidence of diabetes mellitus, age was found to be a critical determinant. Patients aged ≥45 years had a significantly higher likelihood of developing diabetes ($p = 0.007$), aligning with global findings that aging is accompanied by metabolic decline and increased insulin resistance. Interestingly, although obesity and hypertension are commonly cited as major risk factors, this study reported no significant correlation ($p > 0.05$), which may be influenced by sample characteristics or local lifestyle patterns. These findings reinforce the need for age-specific screening and interventions, particularly for adults in their mid-forties and older, while also suggesting a nuanced approach in assessing traditional risk factors within localized population contexts.

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Negara et al. (2025) highlighted the biological consequences of poor glycemic control by showing moderate correlations between elevated blood glucose and altered hematological profiles—such as decreased hemoglobin, hematocrit, and MCV—in diabetic ulcer patients. These physiological changes reflect hyperglycemia-induced erythrocyte dysfunction and chronic inflammation, underlining the systemic impact of poor self-management. Furthermore, another study by Negara et al. (2025) confirmed the clinical relevance of hematological monitoring in diabetes care, emphasizing the need to consider anemia and inflammatory markers as indicators of disease progression. Additionally, a study by Ningsih et al. (2025) showed that the use of virtual reality (VR) in health education significantly increased knowledge and awareness among first-trimester pregnant women, thereby preventing the onset of gestational diabetes mellitus (GDM). This innovative approach suggests that immersive and engaging educational tools can enhance motivation and preventive behaviors even before the onset of diabetes. Altogether, these findings underscore the importance of integrating behavioral, educational, and physiological strategies in managing and preventing diabetes and its complications.

In line with the psychosocial dimensions of diabetes management, the concept of subjective well-being has emerged as an important determinant of health outcomes in patients with Type 2 Diabetes Mellitus. Yulyanti et al. (2024) found that factors such as personality traits, religiosity, and family support were significantly associated with higher levels of subjective well-being among DM patients in Banjarbaru. Patients with extraverted personalities, high religiosity, and strong family support exhibited more positive emotional states, optimism, and better life satisfaction—factors that are known to promote healthier behavior, including diet adherence and self-care. Conversely, individuals with neurotic tendencies or weak social support were more likely to experience stress and dissatisfaction. These findings underscore the importance of incorporating emotional, social, and spiritual support into diabetes care models. Enhancing subjective well-being may not only improve psychological resilience but also foster greater motivation and consistency in following dietary and therapeutic regimens, ultimately contributing to better glycemic control.

CONCLUSION

The majority of patients with Type 2 Diabetes Mellitus were categorized as having low self-motivation, with 52 individuals (48.1%). Additionally, most patients were classified as having poor dietary commitment, with 56 individuals (51.9%). In terms of blood glucose levels, the majority were found to be in the hyperglycemic category, also totaling 56 individuals (51.9%). Based on the Spearman rank test applied to these three variables, the p-value was found to be 0.000 ($p < 0.05$), indicating a significant relationship between self-motivation, dietary commitment, and blood glucose levels in patients with Type 2 Diabetes Mellitus. These findings are further supported by previous studies that highlight the impact of educational interventions and psychological factors on diabetes management. Structured education based on Orem's theory and the use of digital media such as Augmented Reality have been shown to enhance patient motivation, knowledge, and self-care behaviors, leading to better glycemic control. Furthermore, psychological constructs like self-efficacy and behavioral

intention strongly influence dietary adherence. The integration of educational, motivational, and emotional support strategies is essential to improving long-term outcomes in diabetes care.

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