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The Relationship Between the Level of Understanding of Intermittent Fasting and Self-Motivation Behavior Toward the Risk of Increased Blood Glucose in Patients with Diabetes Mellitus

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ABSTRACT/ ABSTRAK

ABSTRACT. *Intermittent Fasting is a nonpharmacological approach that can be applied in patients with Diabetes Mellitus to support blood glucose control; however, its implementation requires an adequate level of understanding and strong self-motivation. This study aimed to analyze the relationship between the level of understanding of Intermittent Fasting and self-motivation toward the risk of increased blood glucose in patients with Diabetes Mellitus. A quantitative approach with a correlational cross-sectional design was employed, involving 66 respondents. Data were analyzed using the Spearman rank correlation test. The results demonstrated a significant relationship between the level of understanding of Intermittent Fasting and self-motivation (r = 0.375; p = 0.002), indicating a positive direction with a weak correlation strength. These findings suggest that a better level of understanding of Intermittent Fasting tends to be associated with higher self-motivation in the context of controlling the risk of increased blood glucose. Structured education regarding Intermittent Fasting may therefore be considered as a strategy to support motivation and healthy lifestyle behaviors among patients with Diabetes Mellitus.*

Kata kunci:

Diabetes Melitus, Intermittent Fasting, Manajemen Diet, Motivasi Diri, Pola Makan

ABSTRAK. Intermittent fasting merupakan salah satu pendekatan nonfarmakologis yang dapat diterapkan pada pasien diabetes melitus untuk mendukung pengendalian kadar gula darah, yang dalam praktiknya memerlukan tingkat pemahaman dan motivasi diri yang baik. Penelitian ini bertujuan untuk menganalisis hubungan antara tingkat pemahaman intermittent fasting dan motivasi diri terhadap risiko peningkatan gula darah pada pasien diabetes melitus. Penelitian ini menggunakan pendekatan kuantitatif dengan desain cross-sectional korelasional dan melibatkan 66 responden. Analisis data dilakukan menggunakan uji *Spearman rank*. Hasil analisis menunjukkan adanya hubungan yang signifikan antara tingkat pemahaman intermittent fasting dan motivasi diri (r = 0,375; p = 0,002), dengan arah hubungan positif dan kekuatan korelasi lemah. Temuan ini menunjukkan adanya kecenderungan bahwa tingkat pemahaman intermittent fasting yang lebih baik berkaitan dengan motivasi diri yang lebih tinggi dalam konteks pengendalian risiko peningkatan gula darah. Edukasi terstruktur mengenai intermittent fasting dapat dipertimbangkan sebagai upaya untuk mendukung motivasi dan perilaku hidup sehat pada pasien diabetes melitus.

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INTRODUCTION

Unhealthy eating patterns are one of the main factors contributing to the increasing incidence of Diabetes Mellitus, particularly in modern societies that tend to consume fast food and high-sugar diets. Eating patterns that do not adequately consider portion size, food type, and meal timing can lead to uncontrolled increases in blood glucose levels and impair pancreatic function in producing insulin optimally (Umayya & Wardani, 2024). In patients with Diabetes Mellitus, irregular eating habits are often exacerbated by polyphagia, defined as excessive hunger, which, if not properly controlled, may further elevate blood glucose levels (Alfiani et al., 2019).

Diabetes Mellitus is a complex chronic metabolic disease with diverse etiologies and serious consequences, both acute and chronic. Genetic and environmental factors play significant roles in its development. Impaired insulin secretion and insulin resistance prevent body cells from metabolizing glucose effectively, resulting in chronic hyperglycemia accompanied by disturbances in macronutrient metabolism (Goyal et al., 2023; Corrêa-Giannella, 2018; Tremblay & Hamet, 2019; Thorsby et al., 1998).

Globally, the burden of Diabetes Mellitus continues to increase substantially. The World Health Organization (WHO) reported that the number of people living with diabetes rose sharply from approximately 200 million in 1990 to about 830 million in 2022 (World Health Organization, 2024). In 2021, the global prevalence of diabetes and that in the Southeast Asia region were recorded at 10.6% and 8.8%, respectively. This trend is consistent with the situation in Indonesia, where the 2023 Indonesian Health Survey (SKI) reported a persistently high diabetes prevalence of 11.7%. The prevalence of diabetes based on physician diagnosis and blood glucose measurements in 2023 was higher than in 2018, with Type 2 Diabetes Mellitus accounting for a larger proportion than Type 1. In line with this trend, the International Diabetes Federation (IDF) projects that both the number and prevalence of individuals with Diabetes Mellitus aged 20–79 years in Indonesia will continue to rise annually, with the disease burden expected to nearly double by 2030 (Kementerian Kesehatan Republik Indonesia, 2025).

Riskesdas data also indicate that the prevalence of Diabetes Mellitus in Indonesia increased from 10.9% in 2018 to 11.7% in 2023. At the local level, the Banjarmasin City Health Office reported an increase in the number of patients with Diabetes Mellitus, with 1,627 cases recorded in the working area of Pekauman Primary Health Center (Puskesmas Pekauman), Banjarmasin, throughout 2024, reflecting a high disease burden in the region.

In patients with Diabetes Mellitus, insulin resistance and impaired insulin secretion are the main problems affecting blood glucose control. Insulin resistance causes insulin to be ineffective in stimulating glucose uptake by tissues. Genetic factors, advanced age, and obesity are known to increase the risk of insulin resistance (Dewi, 2022).

One nonpharmacological approach with potential benefits in supporting Diabetes Mellitus management is Intermittent Fasting. This approach encompasses various forms of time-restricted eating and caloric restriction that have been reported to reduce the risk and severity of metabolic disorders associated with Diabetes Mellitus (Zubrzycki et al., 2019). Intermittent Fasting is commonly implemented by regulating daily eating windows, such as fasting for approximately 16 hours followed by an 8-hour eating period, along with several other protocol variations (Grajower & Horne, 2019; Subhan, 2022).

The successful implementation of Intermittent Fasting in patients with Diabetes Mellitus is strongly influenced by the patients' level of understanding and self-motivation. Preliminary observations at Puskesmas Pekauman, Banjarmasin, indicate that while some patients demonstrate good self-motivation in practicing Intermittent Fasting, others still lack sufficient understanding of its benefits in controlling the risk of increased blood glucose.

Based on these conditions, further research is needed to analyze the relationship between the level of understanding of Intermittent Fasting and self-motivation among patients with Diabetes Mellitus. This study is expected to provide a foundation for the development of more effective educational strategies and behavioral interventions to support dietary management and the control of the risk of increased blood glucose.

RESEARCH METHOD

This study employed a correlational analytical design with a cross-sectional approach to analyze the relationship between the level of understanding of Intermittent Fasting as the independent variable and self-motivation behavior toward the risk of increased blood glucose as the dependent variable. The study was conducted at Puskesmas Pekauman, Banjarmasin, from June to July 2025, involving a population of 187 patients with Diabetes Mellitus based on December 2024 records. The sample size was determined using the Slovin formula with a 10% margin of error, resulting in 66 respondents selected through non-probability sampling using the purposive sampling method. Inclusion criteria consisted of patients with Type 2 Diabetes Mellitus who were undergoing routine treatment, were fully conscious (compos mentis), and willing to participate as respondents. Exclusion criteria included individuals who were illiterate and those with disease complications other than Type 2 Diabetes Mellitus.

Ethical approval for this study was obtained from the Research Ethics Committee of Universitas Muhammadiyah Banjarmasin (KEPK No. 0128226371) on 13 June 2025. Data collection procedures began with the provision of informed consent to the respondents, accompanied by an explanation of the study objectives and ethical considerations, including the principles of anonymity and data confidentiality. Data were collected using a structured questionnaire that had been confirmed to be valid and highly reliable, and were subsequently processed through editing, coding, data entry, cleaning, and tabulating stages. Data analysis was conducted using univariate analysis to describe respondent characteristics and bivariate analysis employing the Spearman Rank correlation test at a significance level of $\alpha = 0.05$ to determine the direction, strength, and significance of the relationship between the level of understanding of Intermittent Fasting and patients' self-motivation in controlling the risk of increased blood glucose.

RESULTS

Respondent Characteristics

Table 1. Frequency Distribution by Age among Patients with Diabetes Mellitus

Age (Years)	Frequency (n)	Percentage (%)
30–59	41	62.12
≥ 60	25	37.88
Total	66	100.00

The results presented in Table 1 indicate that the majority of respondents were aged 30–59 years, totaling 41 individuals (62.12%), while respondents aged ≥60 years accounted for 25 individuals (37.88%).

Table 2. Frequency Distribution by Sex among Patients with Diabetes Mellitus

Age (Years)	Frequency (n)	Percentage (%)
20–29	1	1.52
30–59	41	62.12
> 60	24	36.36
Total	66	100.00

Based on Table 2, the majority of respondents were in the 30–59 year age group, comprising 41 individuals (62.12%). Respondents aged over 60 years accounted for 24 individuals (36.36%), while only one respondent (1.52%) was in the 20–29 year age group. These findings indicate that most patients with Diabetes Mellitus in this study were within the middle-aged to older adult population, reflecting the predominance of diabetes cases among individuals in these age ranges.

Table 3. Frequency Distribution by Educational Level among Patients with Diabetes Mellitus

Educational Level	Frequency (n)	Percentage (%)
No formal education	3	4.55
Primary school	33	50.00
Junior high school	17	25.76
Senior high school	12	18.18
Diploma (D3)	0	0.00
Bachelor's degree	1	1.52
Total	66	100.00

Table 3 shows that most respondents had a primary school education, totaling 33 individuals (50.00%). Respondents with junior high school education numbered 17 individuals (25.76%), senior high school education 12 individuals (18.18%), bachelor's degree 1 individual (1.52%), and no respondents held a diploma (D3).

Table 4. Frequency Distribution by Occupation among Patients with Diabetes Mellitus

Occupation	Frequency (n)	Percentage (%)
Self-employed	13	19.70
Housewife	46	69.70
Laborer	2	3.03
Farmer	2	3.03
Retiree	3	4.55
Total	66	100.00

As shown in Table 4, the majority of respondents were housewives, totaling 46 individuals (69.70%). Self-employed respondents numbered 13 individuals (19.70%), laborers and farmers each accounted for 2 individuals (3.03%), and retirees numbered 3 individuals (4.55%).

Table 5. Frequency Distribution by Duration of Diabetes Mellitus

Duration of Diabetes Mellitus	Frequency (n)	Percentage (%)
< 1 year	12	18.18
1–5 years	41	62.12

6–10 years	8	12.12
11–15 years	2	3.03
> 16 years	3	4.55
Total	66	100.00

Based on Table 5, most respondents had been living with Diabetes Mellitus for 1–5 years, totaling 41 individuals (62.12%). Respondents with a disease duration of less than 1 year numbered 12 individuals (18.18%), 6–10 years 8 individuals (12.12%), 11–15 years 2 individuals (3.03%), and more than 16 years 3 individuals (4.55%).

Table 6. Frequency Distribution by Routine Medical Visit Schedule

Routine Medical Visit Schedule	Frequency (n)	Percentage (%)
Once a week	4	6.06
Once a month	49	74.24
Twice a month	13	19.70
Total	66	100.00

Table 6 indicates that the majority of respondents attended routine medical visits once a month, totaling 49 individuals (74.24%). Respondents who visited twice a month numbered 13 individuals (19.70%), while those attending once a week numbered 4 individuals (6.06%).

Univariate Analysis

Table 7. Distribution of the Level of Understanding of Intermittent Fasting

Level of Understanding	Frequency (n)	Percentage (%)
Good	0	0.00
Fairly good	12	18.18
Poor	54	81.82
Total	66	100.00

Based on Table 7, most respondents had a poor level of understanding of Intermittent Fasting, totaling 54 individuals (81.82%). Respondents with a fairly good level of understanding numbered 12 individuals (18.18%), and none demonstrated a good level of understanding.

Table 8. Distribution of Self-Motivation Toward the Risk of Increased Blood Glucose

Self-Motivation Level	Frequency (n)	Percentage (%)
High	2	3.03
Low	64	96.97
Total	66	100.00

Table 8 shows that the majority of respondents had low self-motivation toward the risk of increased blood glucose, totaling 64 individuals (96.97%), while only 2 individuals (3.03%) exhibited high self-motivation.

Bivariate Analysis

Bivariate analysis was conducted to examine the relationship between the independent and dependent variables using the Spearman rank correlation test, as the data were measured on an ordinal scale.

Table 9. Relationship between the Level of Understanding of Intermittent Fasting and Self-Motivation

Level of Understanding	Self-Motivation				Total	
	Low		High		Total	%
	f	%	f	%		
Poor	54	100.0	0	0.0	54	100.0
Fairly good	10	83.3	2	16.7	12	100.0
Total	64	97.0	2	3.0	66	100.0
p Value = 0,002						
***Coefisien Correlation* = 0.375**						

The results in Table 9 indicate that all 54 respondents with a poor level of understanding of Intermittent Fasting had low self-motivation. In contrast, among the 12 respondents with a fairly good level of understanding, 2 individuals (16.7%) demonstrated high self-motivation. The Spearman rank test yielded a p-value of 0.002 (<0.05) with a correlation coefficient (r) of 0.375, indicating a positive relationship with weak correlation strength between the level of understanding of Intermittent Fasting and self-motivation toward the risk of increased blood glucose among patients with Diabetes Mellitus.

DISCUSSION

Based on the study findings, most respondents were aged 30–59 years, totaling 41 individuals (62.12%). Age above 30 years is associated with anatomical, physiological, and biochemical changes that affect glucose metabolism, with an average annual increase in blood glucose levels of 6–13 mg/dL, making age an important factor in the occurrence of Type 2 Diabetes Mellitus (Kurdi et al., 2021). After the age of 40 years, the decline in physiological functions, including endocrine function related to insulin production, accelerates, reducing pancreatic beta-cell sensitivity and increasing glucose intolerance, thereby elevating the risk of Diabetes Mellitus. In addition, age-related changes in body composition, such as loss of muscle mass and increased body fat, reduce the body's ability to manage elevated blood glucose levels and may trigger long-term complications, including cardiovascular disease, ultimately lowering overall quality of life (Rohmatulloh et al., 2024).

The majority of respondents were female, accounting for 50 individuals (75.76%), who tend to have a higher predisposition to body fat accumulation and reduced insulin sensitivity due to hormonal factors such as premenstrual syndrome and postmenopausal conditions (Rif'at et al., 2023). Beyond hormonal influences, women generally have a higher body mass index, and the accumulation of visceral fat can reduce insulin effectiveness in muscle and liver tissues, making blood glucose regulation more difficult (Saherna & Rezkiawan, 2020). Educational level also plays a critical role, with most respondents having primary school education (33 individuals; 50.00%) and only one respondent holding a bachelor's degree (1.52%). Formal education influences health knowledge, the ability to recognize early symptoms of Diabetes Mellitus, and adherence to treatment and healthy lifestyle behaviors. Consequently, individuals with lower educational attainment are more vulnerable to diabetes-related risks due to limited information and understanding of preventive measures (Luthfa & Fadhilah, 2021; Arisma et al., 2017).

Most respondents were housewives, totaling 46 individuals (69.70%), whose physical activity levels tend to be light, although some reported engaging in light exercise such as jogging or aerobic activities (Alwari et al., 2023). Occupations characterized by low physical activity may increase the risk of Diabetes Mellitus compared to jobs requiring higher physical exertion. However, household activities may still contribute to daily energy expenditure

(Saherna & Rezkiawan, 2020; Siburian et al., 2024). The duration of Diabetes Mellitus was also an important factor, with most respondents having lived with the disease for 1–5 years (62.12%). Newly diagnosed patients often experience psychological distress due to anxiety related to their health condition, whereas patients with a longer disease duration tend to adapt better, although the risk of complications remains present (Siburian et al., 2024; Alwari et al., 2023; Laili et al., 2019). In addition, adherence to routine medical visits at Puskesmas Pekauman, most commonly once a month (49 individuals; 74.24%), facilitates glucose monitoring, nutritional education, therapy evaluation, and early detection of complications, in line with national health guidelines aimed at preventing Diabetes Mellitus complications. Regular follow-up visits enhance patient awareness and motivation to maintain healthy lifestyles, thereby positively influencing disease management and reducing the risk of long-term complications (Fadhilah et al., 2025; Indra et al., 2025).

Univariate analysis showed that most respondents had a poor level of understanding of Intermittent Fasting, totaling 54 individuals (81.82%), while 12 individuals (18.18%) demonstrated a fairly good level of understanding. These findings indicate that the majority of respondents lacked adequate understanding of Intermittent Fasting as a dietary strategy for patients with Diabetes Mellitus. This limited understanding may be influenced by public perceptions that fasting or dietary restriction is risky for individuals with Diabetes Mellitus. However, evidence suggests that, when implemented under medical supervision, Intermittent Fasting can be safe and beneficial for blood glucose management (Msane et al., 2024). Patients' level of understanding also reflects their ability to interpret health information. Notoatmodjo (2018) emphasized that understanding involves not only recalling information but also interpreting and applying knowledge in daily life. Therefore, interactive and participatory educational approaches are essential to enhance patient understanding and self-regulation in disease management.

Furthermore, univariate analysis of self-motivation revealed that most respondents had low self-motivation, with 64 individuals (96.97%). This finding indicates that although patients may be aware of the importance of Diabetes Mellitus management, their capacity and readiness to adopt healthy behaviors remain suboptimal. Patient self-motivation is influenced by the quality and intensity of communication with healthcare providers. Dewi (2020) highlighted the importance of effective interpersonal communication in improving patient understanding and motivation. Clear and communicative interactions can encourage patients to take a more active role in managing their condition. Educational level also plays a role, as patients with only basic education may experience difficulties in optimally absorbing health-related information (Diastiti, 2023). Accordingly, health education programs tailored to patients' educational backgrounds may improve health literacy and self-motivation in managing Diabetes Mellitus.

Bivariate analysis demonstrated a significant relationship between the level of understanding of Intermittent Fasting and self-motivation toward the risk of increased blood glucose among patients with Diabetes Mellitus at Puskesmas Pekauman, with a p-value of 0.002 ($< \alpha = 0.05$) and a correlation coefficient of $r = 0.375$. This result indicates a positive relationship with weak correlation strength. The finding suggests that better understanding of Intermittent Fasting is associated with higher self-motivation to adopt healthy lifestyle behaviors and adhere to treatment recommendations. These results are consistent with the study by Dewi (2020), which emphasized that clear and effective interpersonal communication enhances health literacy and subsequently influences patient motivation. Moreover, interactive educational methods involving active patient participation, such as

question-and-answer sessions and small group discussions, have been shown to improve both understanding and self-motivation. Fulkerson et al. (2020) explained that active engagement in educational activities helps individuals connect new information with personal experiences, making it easier to understand, remember, and apply in daily life. This participatory approach aligns with cognitive psychology principles that emphasize linking new knowledge with prior experience as a key component of effective learning. Such participatory strategies may therefore serve as effective interventions at Puskesmas Pekauman to enhance patient self-control in managing the risk of increased blood glucose.

CONCLUSION

Based on the study findings, the majority of patients with Diabetes Mellitus at Puskesmas Pekauman, Banjarmasin, demonstrated a limited level of understanding of Intermittent Fasting and low self-motivation in controlling the risk of increased blood glucose. The analysis revealed a positive relationship between the level of understanding of Intermittent Fasting and patients' self-motivation, indicating that improved understanding may encourage patients to be more motivated to adopt appropriate dietary practices and healthy lifestyle behaviors. Therefore, it is recommended that Puskesmas implement regular educational and socialization programs on the benefits and practical application of Intermittent Fasting using interactive and easily understandable methods. Such efforts may enhance patient awareness, motivation, and capacity to manage blood glucose levels more effectively.

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