The Effect of The Extended Health Belief Model on Random Blood Glucose Levels and Quality of Life of Diabetes Mellitus Patients at Bontobangun Public Health Center, Bulukumba Regency

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ABSTRACT

Diabetes mellitus (DM) is a condition that requires long-term management and can lead to complications such as kidney failure, retinopathy, stroke, gangrenous wounds, and diabetic neuropathy. According to data from the Bulukumba Regency Health Office from January to September 2024, there were 6,557 cases of DM. The highest number of cases was at the Bontobangun Public Health Center, with 863 cases. One effective approach is the Extended Health Belief Model (EHBM), which emphasizes perceptions of susceptibility, severity, benefits, barriers, and self-efficacy. This study aimed to determine the effect of the EHBM on the random blood glucose levels and quality of life of DM patients at the Bontobangun Public Health Center in Bulukumba Regency. This research used a quantitative approach with a quasi-experimental method and a control time series design. In this design, respondents were divided into two groups: an intervention group and a control group. The study population consisted of 240 middle-aged individuals, and a sample of 32 people was selected. Based on statistical analysis using the Independent Samples T-test, the results showed a p-value of 0.003 ($p < 0.05$) for blood glucose levels and 0.000 ($p < 0.05$) for quality of life. These results indicate a significant effect of the EHBM on the random blood glucose levels and quality of life of DM patients at the Bontobangun Public Health Center. The EHBM is an effective educational approach for DM patients as it led to a decrease in blood glucose levels and an increase in quality of life. For future research, it is suggested to use an EHBM-based educational approach in DM patient management programs, as it has been proven to lower blood glucose and improve quality of life.

Keywords: Diabetes Mellitus; Extended Health Belief Model; Random Blood Glucose Levels; Quality of Life

INTRODUCTION

In the medical field and everyday conversation, diabetes mellitus is often referred to as “kencing manis” (sweet urine disease). This condition is a chronic metabolic disorder characterized by abnormally high blood glucose levels. According to data from the World Health Organization (WHO), in 2023, approximately 422 million people

worldwide were living with this disease. WHO also projects that diabetes mellitus cases in Indonesia will increase drastically, from 8.4 million in 2000 to 21.3 million in 2030. Among all patients, 80% are from developing countries, including Indonesia (Azizah, 2018).

Based on data from the International Diabetes Federation (IDF) in 2022, Indonesia ranks first in Southeast Asia and 34th globally in the number of people with diabetes mellitus. It is estimated that around 10 million Indonesians are living with this disease. This figure positions Indonesia as the only Southeast Asian country included in the global ranking, highlighting its significant contribution to the high prevalence of diabetes in the region (Kemenkes RI, 2020).

According to the the Indonesian Health Survey (SKI) in 2023 the prevalence of this disease in Indonesia was 2.2% among individuals aged 15 years and above. Specifically, South Sulawesi Province ranked 10th with a prevalence rate of 2.0%. This figure shows an increase compared to the 2018 Basic Health Research (Riskesdas) report, which recorded a prevalence of 1.8%, indicating a rise to 2.0% within five years by 2023.

Based on the 2018 Basic Health Research (Riskesdas), the prevalence of this disease diagnosed by doctors among individuals aged 15 years and above in South Sulawesi Province reached 1.83%. In this context, Bulukumba Regency was recorded as ranking sixth with a higher prevalence rate of 2.07%. This figure indicates an increase in cases over a five-year period, as the 2013 Riskesdas data reported a prevalence of 1.9%, which then rose to 2.07% in 2018.

According to data from the Bulukumba District Health Office, the number of diabetes mellitus cases in Bulukumba Regency reached 6,557 as of September 2024. Among the 21 existing community health centers (Puskesmas), Bontobangun Health Center recorded the highest number, with 863 cases. The number of patients at Bontobangun Health Center has also shown a significant increase over the years: 471 cases in 2021, rising sharply to 1,435 in 2022, and continuing to increase to 1,850 cases in 2023.

If not properly managed, diabetes mellitus can lead to various serious complications. This disease may damage the eyes, kidneys, and nerves. The health problems caused by diabetes mellitus can also reduce the quality of life of those affected (Kaluku, 2021). In addition, this disease has the potential to cause other non-communicable diseases, such as heart disease, stroke, and kidney failure (Jaelani et al.,

2024).

Quality of life for individuals with diabetes mellitus refers to the sense of happiness and satisfaction in daily living. It represents a person's overall satisfaction with life, encompassing physical, psychological, social, and environmental aspects. Poor quality of life may lead to various complications, such as vision problems, nerve dysfunction, and vascular disorders, which can eventually result in disability or even death. Patients who do not receive adequate treatment often experience deterioration in physical, social, and psychological functions due to persistent pain and continuous medical care, which in turn disrupts overall body function. A study by Chusmeywati revealed that approximately 71.2% of patients with this disease suffer from poor quality of life (Safitri & Ahmad Syafiq, 2022).

Quality of life is an important indicator in the management of chronic diseases such as diabetes mellitus. At Bontobangun Health Center, Bulukumba Regency, preliminary observations indicated that many patients experience a low quality of life. Most patients reported frequently feeling weak and anxious about complications. They also tend to lack confidence in undergoing treatment and do not fully understand the importance of consistently managing diet and physical activity.

In the first week of monitoring, most diabetes mellitus patients were in the moderate or poor quality of life category, and none were recorded as having a very good quality of life. This condition reflects the lack of awareness, motivation, and ability of patients to independently manage diabetes mellitus. This phenomenon is the main reason why this study focuses on quality of life. Clinical improvements, such as blood glucose levels alone, are not sufficient without being accompanied by an enhancement in patients' quality of life across physical, mental, social, and environmental aspects. Patients with this disease require not only medical treatment but also educational support that can transform their health perceptions and behaviors.

To reduce the prevalence rate and prevent the disease, proper health management is required. This includes four main pillars: understanding diabetes mellitus through education, dietary management, physical exercise, and pharmacological therapy. These four pillars serve as a comprehensive strategy for the effective management of diabetes mellitus (Sundari & Sutrisno, 2023).

Education is one of the four main foundations in the management of diabetes mellitus (Rismayanti et al., 2021). One of the educational approaches applied is the

Extended Health Belief Model (EHBM). This model aims to enhance the motivation of diabetes mellitus patients to adopt healthier behaviors. Educational interventions based on the EHBM have been proven effective in improving patients' understanding and motivation to live a healthy lifestyle. Research has shown (Nuzula et al., 2023) showed a significant relationship between health perception–based behaviors and the ability to maintain blood glucose levels. This is consistent with other findings that highlight the same association. This is in line with the findings of (Widhiastuti & Candra, 2023) which states that the Health Belief Model serves as a guideline for individuals in making decisions and engaging in healthy behaviors.

The Extended Health Belief Model (EHBM) has advantages as it can enhance patients' understanding of health risks and the benefits of preventive actions they undertake. This model also helps address various barriers they may encounter. The EHBM expands upon the elements of the Health Belief Model (HBM) by incorporating the concept of self-efficacy, as demonstrated in Bayat's study.

Based on the analysis of previous studies, no research has specifically examined the effect of the Extended Health Belief Model on random blood glucose levels and the quality of life of patients with diabetes mellitus. In this study, the researcher provided education on the EHBM over six weeks, consisting of six sessions of 50–55 minutes each, with repeated measurements conducted. Therefore, the researcher is interested in investigating the effect of the Extended Health Belief Model on random blood glucose levels and the quality of life of diabetes mellitus patients at Bontobangun Health Center, Bulukumba Regency.

MATERIALS AND METHODS

This study employed a quantitative approach with a quasi-experimental method and a control time series design. The research was conducted at Bontobangun Health Center, Bulukumba Regency, from April to May 2025. The study population consisted of 240 middle-aged patients with diabetes mellitus. From this population, a sample of 32 participants was selected and evenly divided into two groups: 16 in the intervention group and 16 in the control group. The sample was chosen using a probability sampling technique with the simple random sampling method. The instruments used in this study included an EHBM leaflet, observation sheets, a glucometer (blood glucose measuring device), and the WHOQOL-BREF quality of life questionnaire.

Bivariate analysis was conducted to identify the relationship between independent

and dependent variables. Therefore, this study employed an independent t-test. All data were analyzed using SPSS version 22 for Windows. Furthermore, this research obtained ethical approval from the Research Ethics Committee of Stikes Panrita Husada Bulukumba with approval number 000743/KEP Stikes Panrita Husada Bulukumba/2025.

RESULTS

The results from Table 1 show that the 32 respondents, divided into two groups, had almost similar demographic characteristics. The majority of respondents in both groups were aged 51–55 years, accounting for 43.8% in the intervention group and 50.0% in the control group. Most respondents were also female, with 87.5% in the intervention group and 93.8% in the control group. Differences were observed in terms of education, where most respondents in the intervention group had completed senior high school (68.8%), while in the control group, the majority had only completed elementary school (43.8%). Furthermore, the majority of respondents in both groups were unemployed or housewives, with 68.8% in the intervention group and 93.8% in the control group.

Table 1. Frequency Distribution of Respondents' Characteristics at Bontobangun Health Center, Bulukumba Regency

Respondents Characteristics	Intervention		Control	
	Frequency	%	Frequency	%
Age				
45-50 years	3	18,8 %	4	25,0 %
51-55 years	7	43,8 %	8	50,0 %
56-59 years	6	37,5%	4	25,0 %
Gender				
Male	2	12,5 %	1	6,3 %
Female	14	87,5%	15	93,8 %
Last Education				
Elementary School	0	0,0 %	7	43,8 %
Junior High School	0	0,0%	5	31,3 %
Senior High School	11	68,8 %	4	25,0 %
Higher Education	5	31,3 %	0	0,0%
Occupation				
Unemployed/Housewife	11	68,8 %	15	93,8 %
Civil Servant	4	25,0 %	0	0,0%
Entrepreneur	0	0,0%	1	6,3 %
Retired	1	6,3 %	0	0,0%
Total	16	100 %	16	100%

According to the data in Table 2, there was a difference in the average blood glucose levels between the two groups. In the first week, the mean blood glucose level of the intervention group was 230.06 mg/dL, which was significantly lower than that of the control group at 305.06 mg/dL. By the second week, the blood glucose level in the intervention group further decreased to 219.00 mg/dL, while the control group

increased to 307.31 mg/dL, resulting in a wider gap between the groups. The decline continued into the third week, where the mean blood glucose level of the intervention group dropped to 198.25 mg/dL, while the control group slightly decreased to 277.63 mg/dL.

In the fourth week, the mean blood glucose level of the intervention group was 220.69 mg/dL, while the control group reached 312.88 mg/dL, with a difference of approximately 92.19. The decrease continued in the fifth week, where the mean blood glucose level of the intervention group dropped to 197.25 mg/dL, while the control group was at 286.25 mg/dL, resulting in a difference of 89. By the sixth week, the gap had widened further. The mean blood glucose level of the intervention group decreased sharply to 169.00 mg/dL, while the control group remained at 268.00 mg/dL, producing an increased average difference of 99.

Table 2. Distribution of Blood Glucose Levels in the Intervention and Control Groups During Six Weeks of Treatment

Blood Glucose Level	Intervention		Control		S
	Mean	SD	Mean	SD	
Week 1	230,06	94,385	305,06	142,385	75
Week 2	219,00	93,813	307,31	130,078	88,31
Week 3	198,25	66,291	277,63	114,665	79,38
Week 4	220,69	58,585	312,88	144,028	92,19
Week 5	197,25	67,251	286,25	120,605	89
Week 6	169,00	53,871	268,00	104,385	99

Based on Table 3, in the first week, the quality of life in the two groups showed differences. In the intervention group, no respondents were classified as having very poor or very good quality of life. A total of 12 respondents (60%) were in the moderate category, while 3 respondents (18.8%) had good quality of life, and 1 respondent (6.3%) was in the poor category. In contrast, in the control group, no respondents had good or very good quality of life. The majority of respondents were in the poor category, with 8 respondents (50%), while the remaining 8 respondents (50%) were in the moderate category.

In the second week, the quality of life in the intervention group showed improvement. No respondents were in the very poor or poor categories, with the majority, 13 respondents (81.3%), classified as moderate and 3 respondents (18.8%) in the good category. In contrast, in the control group, there was no significant improvement, with 6 respondents (37.5%) still in the poor category and 10 respondents (62.5%) classified as moderate.

In the third week, there was no significant change in the quality of life of

respondents in either group. In the intervention group, no respondents were categorized as very poor, poor, good, or very good, with 11 respondents (68.8%) remaining in the moderate category. Conversely, in the control group, 8 respondents (50.0%) remained in the poor category, while another 8 respondents (50.0%) were in the moderate category, with none reaching the good or very good quality of life categories.

In the fourth week, the quality of life in the intervention group showed a significant improvement. Fourteen respondents (93.3%) were now in the good category, and one respondent (6.7%) even reached the very good category. Only one respondent (6.7%) remained in the moderate category, while none were in the poor category. On the other hand, the condition in the control group showed no improvement. Fourteen respondents (87.5%) remained in the moderate category, and two respondents (12.5%) were still in the poor category. No respondents in the control group achieved good or very good quality of life.

In the fifth week, the quality of life in the intervention group showed a significant improvement. Thirteen respondents (81.3%) were now in the good category, and three respondents (18.7%) reached the very good category. On the other hand, the control group showed no improvement. Three respondents (18.7%) remained in the poor category, while thirteen respondents (81.3%) were in the moderate category.

In the sixth week, the quality of life in the intervention group demonstrated a significant improvement. Ten respondents (62.5%) were in the good category, while six respondents (37.5%) reached the very good category. On the other hand, the control group showed no improvement. Four respondents (25.0%) remained in the poor category, while twelve respondents (75.0%) were still in the moderate category.

Table 3. Distribution of Quality of Life in the Intervention and Control Groups During Six Weeks of Treatment

Quality of Life	Intervention					Control				
	Very Poor	Poor	Moderate	Good	Very Good	Very Poor	Poor	Moderate	Good	Very Good
Week 1	0	1	12	3	0	0	8	8	0	0
	(0,0)%	(11,1%)	(60, %)	(100%)	(0,0%)	(0,0%)	(88,9%)	(40,0%)	(0,0%)	(0,0%)
Week 2	0	0	13	3	0	0	6	10	0	0
	(0,0%)	(0,0%)	(56,5%)	(100%)	(0,0%)	(0,0%)	(100%)	(43,5%)	(0,0%)	(0,0%)
Week 3	0	0	11	5	0	0	8	8	0	0
	(0,0%)	(0,0%)	(57,9%)	(100,%)	(0,0%)	(0,0%)	(100,%)	(42,1%)	(0,0%)	(0,0%)
Week 4	0	0	1	14	1	0	2	14	0	0
	(0,0%)	(0,0%)	(6,7%)	(100,%)	(100,%)	(0,0%)	(100,%)	(93,3%)	(0,0%)	(0,0%)
Week 5	0	0	0	13	3	0	3	13	0	0
	(0,0%)	(0,0%)	(0,0%)	(100%)	(100%)	(0,0%)	(100%)	(100%)	(0,0%))	(0,0%)

Week 6	0	0	0	10	6	0	4	12	0	0
	(0,0%)	(0,0%)	(0,0%)	(100%)	(100%)	(0,0%)	(100%)	(100%)	(0,0%)	(0,0%)

Based on the data from Table 4, in the sixth week, the mean blood glucose level in the intervention group was 169.00 mg/dL, which was markedly lower than that of the control group at 268.00 mg/dL. This indicates that the intervention using the Extended Health Belief Model was effective in controlling blood glucose levels in patients with type 2 diabetes mellitus. This finding is further supported by the results of the independent t-test, which yielded a p-value of 0.003 ($p < 0.05$), indicating a significant difference in the mean blood glucose levels between the two groups after six weeks of intervention.

Based on the data from Table 4, in the sixth week, the mean quality of life in the intervention group was 4.38, which falls into the good category. This was markedly different from the control group, which had a mean of 2.75, classified as poor. This indicates that the intervention using the Extended Health Belief Model was effective in improving the quality of life of patients with type 2 diabetes mellitus. Statistical analysis (independent t-test) showed highly significant results, with a p-value of 0.000 ($p < 0.05$), demonstrating a significant difference in mean quality of life after six weeks of intervention at Bontobangun Health Center, Bulukumba Regency.

Table 4. Analysis of the Effect of the Extended Health Belief Model on Random Blood Glucose Levels and Quality of Life of Patients with Type 2 Diabetes Mellitus

Blood Glucose Level	Mean (SD)	P Value
Blood Glucose Level		
Intervention Group	169,00 (53,871)	0,003
Control Group	268,00 (104,385)	
Quality of Life		
Intervention Group	4,38 (0,500)	0,000
Control Group	2,75 (0,447)	

DISCUSSION

The results of this study indicate that education based on the Extended Health Belief Model (EHBM) has a significant impact on patients with diabetes mellitus. There was a notable difference in random blood glucose levels before and after the intervention. The mean blood glucose levels decreased following the education, indicating that the EHBM was effective in helping patients control their blood glucose.

This finding is supported by the Bullet Theory, also known as the Hypodermic Needle Theory, proposed by Melvin De Fleur (1982). This communication theory suggests that messages delivered repeatedly are received directly and quickly by the audience, producing a strong effect and being stored in long-term memory, which can be

recalled at any time—similar to a bullet being fired directly at a target or a hypodermic needle injecting information into the recipient's mind (Suswani et al., 2018).

The researchers hypothesize that the reduction in blood glucose levels was due to increased awareness and motivation among patients after gaining a better understanding of the risks and consequences of diabetes mellitus through EHBM education. The structured and continuous education conducted over six weeks provided patients with the opportunity to consistently implement healthy lifestyle changes. Patients actively applied the EHBM educational material in their daily lives, such as maintaining a proper diet, avoiding excessive sugar consumption, andengaging in regular physical activity.

The study by (Dwijayanti, 2022) is in line with this finding. The research demonstrated a significant effect of a diabetes empowerment education program on the health belief model of patients with type 2 diabetes. This was evidenced by an increase in the mean scores of the model after the intervention, as well as improvements across all its dimensions: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and self-efficacy. This indicates that the education participants became more confident in their ability to manage diabetes after receiving the program.

According to (Suswani et al., 2022) there was a significant change in patients' knowledge and self-efficacy after they received health education through printed media such as leaflets. The findings of (Afniratri, 2023) demonstrated that diabetes patients who received education had, on average, higher perceived susceptibility scores compared to those who did not receive education, although this difference was not statistically significant. Diabetes patients who received education had, on average, higher perceived severity scores than those without education, and this difference was statistically significant. Additionally, patients who received education had higher perceived benefit scores compared to those who did not, with a meaningful impact.

In addition, the study by (Suswani, 2025) reported a decrease in random blood glucose levels after the intervention, suggesting that cognitive-behavioral therapy had an effect on glycemic control in patients with diabetes mellitus. Furthermore, in the control group, no differences were observed in pain scale scores; however, the random blood glucose levels showed a significant change from pre- to post-test.

This study found that the quality of life of patients with diabetes mellitus changed significantly after receiving education based on the EHBM. The mean quality of life

scores increased following the intervention, reflecting improvements in the physical, psychological, social, and environmental aspects of the patients' lives. One of the main reasons why individuals do not adhere to diabetes management is a lack of understanding, attitude, belief, and trust. Limited patient knowledge about the disease can affect how they perceive their condition, their motivation, problem-solving ability, and behavior change. Adequate knowledge of diabetes is essential as it serves as a tool for patients to manage the condition throughout their lifetime. The better patients understand their disease, the more they comprehend how and why to modify their behavior. Adherence to this management directly contributes to an improvement in their quality of life.

This change can be explained through the mechanism of the EHBM, which aims to enhance patients' understanding and motivation to adopt healthy behaviors. The education provided includes increasing risk perception (susceptibility and severity), understanding the benefits of preventive actions, reducing barriers, and improving self-efficacy. By enhancing understanding and confidence in their own abilities, patients become more capable of independently managing their health conditions.

The researchers assume that EHBM-based education can enhance patients' awareness and understanding of the importance of active participation in disease management. Changes in quality of life occur as a result of improved healthy behaviors consistently practiced after the intervention. Patients apply the EHBM educational material in real-life situations, such as managing their diet and engaging in physical activity.

This is in line with the study conducted by (Mutmainnah et al., 2020) which showed a relationship between adherence and quality of life in patients with type 2 diabetes mellitus at a hospital in Central Java. Additionally, the research by (Lestari, 2022) demonstrated that high self-efficacy positively affects the quality of life of type 2 diabetes patients. Similarly, the study by Putri (2021) indicated a significant difference in quality of life influenced by patients' knowledge, both before and after educational interventions, compared to the control group.

The study conducted by (Umam et al., 2020) indicated that the majority of respondents had a fairly good quality of life, in terms of physical, psychological, social relationships, and environmental aspects. Therefore, the role of healthcare professionals is crucial in promoting health to improve the quality of life of patients with diabetes

mellitus. In line with this, the study by also demonstrated a significant difference in the quality of life of patients with type 2 diabetes mellitus between the untreated group and the treated group at the Endocrinology Clinic of dr. Saiful Anwar General Hospital, Malang.

The results of the study at Bontobangun Health Center showed a significant difference in the blood glucose levels of patients with type 2 diabetes mellitus after receiving the intervention for six weeks. The intervention group experienced a decrease in blood glucose levels, demonstrating that the Extended Health Belief Model (EHBM) has a significant effect on the blood glucose levels of patients with this condition.

The EHBM education was delivered using leaflets. Leaflets are an effective medium for health education. One of their advantages is practicality, as they can be carried anywhere. Leaflets are also cost-effective and allow recipients to study independently without the need to take notes. Additionally, the information presented can be more detailed than verbal communication and can be shared with group members for discussion. Another advantage is that this medium is easy to produce, reproduce, and adapt to the target audience (Yeni, 2021).

The blood glucose levels of patients with diabetes mellitus at Bontobangun Health Center, Bulukumba Regency, decreased during the first, second, and third weeks. In the fourth week, blood glucose levels increased due to a temporary decline in motivation. The fourth week may represent a transitional phase in which patients' enthusiasm slightly decreases (known in behavior change theory as the resistance phase). Patient adherence declined as they became less consistent in following recommendations due to factors such as boredom, stress, hormonal influences, uncontrolled eating during family events, lack of sleep, and reduced physical activity. Additionally, some individuals experienced physiological adaptation responses, where the body fluctuates while adjusting to lifestyle changes. In the fifth week, blood glucose levels decreased again, indicating that patients had improved their lifestyle habits. Similarly, in the sixth week, a significant decrease was observed in the intervention group, demonstrating that EHBM education was effective in enhancing understanding, self-efficacy, and adherence.

The researchers assume that EHBM-based education successfully changed patients' behaviors in managing diabetes mellitus, such as maintaining a proper diet and engaging in regular physical activity. These behavioral changes directly contributed to the reduction in blood glucose levels. Furthermore, with increased

perceptions of susceptibility and severity, as well as awareness of the benefits of proper management, patients became more disciplined in practicing a healthy lifestyle and developed higher self-efficacy in managing their condition.

This reduction in blood glucose levels aligns with previous research by (Nuzula et al., 2023) which showed a significant correlation between health belief–based behaviors and the maintenance of blood glucose levels. Furthermore, the study by (Widhiastuti & Candra, 2023) demonstrated that this model serves as a guide for individuals to adopt healthy behaviors and make health-related decisions.

Providing education using leaflets as a medium has been proven effective. The study results showed a significant difference in fasting blood glucose levels among patients with type 2 diabetes mellitus. After 30 days, the intervention group demonstrated increased adherence and a reduction in blood glucose levels, whereas the control group showed no such changes (Yeni, 2021).

Based on the results of a study conducted at Bontobangun Public Health Center, a difference in quality of life was observed over a six-week treatment period among patients with type 2 diabetes mellitus. The intervention group experienced an improvement in quality of life following the intervention. A significant influence of the Extended Health Belief Model (EHBM) on the quality of life of patients with diabetes mellitus was found at Bontobangun Public Health Center, Bulukumba Regency.

The improvement in quality of life scores after the EHBM intervention indicates that education based on the Extended Health Belief Model (EHBM) impacts not only medical aspects, but also physical, psychological, social, and environmental well-being. Patients felt a greater sense of control over their condition, which psychologically increased their self-confidence and reduced anxiety. Healthier lifestyle changes, such as regular eating habits and consistent physical activity, supported physical functioning and vitality. Additionally, the social support provided during the intervention sessions contributed to improvements in the social domain of quality of life.

The researcher assumes that the improvement in quality of life is due to positive behavioral changes that emerged after patients understood the risks and benefits of actions through the EHBM approach. Patients consistently applied the educational materials in their daily lives throughout the intervention period. In addition, patients' perceptions of their illness improved through the EHBM-based education, leading to changes in attitudes and perspectives. A more positive perception of the disease

condition can contribute to an enhanced quality of life.

In line with the research conducted by (Lismayanti & Sari, 2020) it was shown that there is a significant difference in the quality of life of tuberculosis (TB) patients before and after receiving education based on the Health Belief Model (HBM). This study was conducted at the Tamansari Community Health Center (PKM) in Tasikmalaya City. Research by (Kinwati, 2023) found that, in general, the quality of life of patients with diabetes mellitus, as measured by the WHOQOL questionnaire, was categorized as moderate. This study can be used as a reference to enhance health promotion related to the four pillars of diabetes mellitus, to be implemented in each area where diabetes patients are present, ultimately aiming to improve their quality of life. In addition, the study by (Lestari, 2022) showed that higher self-efficacy is associated with a better quality of life in patients with type 2 diabetes mellitus.

The study conducted by (Oktafia, 2022) showed that self-efficacy and quality of life were influenced among groups of type 2 diabetes mellitus patients in RW 01 and RW 03 areas of Surabaya. This indicates that better knowledge and motivation lead to increased self-efficacy and, in turn, an improved quality of life. Another study by (Yumassik et al., 2022) revealed a significant relationship between blood glucose levels and quality of life. The correlation test indicated that the lower the blood glucose level, the better the quality of life of diabetes mellitus patients.

Thus, it can be concluded that the implementation of the Expanded Health Belief Model (EHBM) approach has a significant impact on blood glucose levels and the improvement of quality of life in individuals with diabetes mellitus by enhancing risk perception, perceived severity, perceived benefits, self-efficacy, and reducing perceived barriers, thereby enabling more optimal self-management. The Expanded Health Belief Model (EHBM) is not a factor that directly influences blood glucose levels or quality of life. However, this model plays an important role in shaping patients' perceptions and motivation regarding disease management. EHBM can influence changes in health behavior through its components: perceived susceptibility (awareness of risk), perceived severity (awareness of serious consequences), perceived benefits, perceived barriers (factors that encourage or hinder action), and self-efficacy (self-confidence).

When the EHBM approach is combined with other factors such as a balanced diet, regular exercise, and adherence to medication, its impact on lowering blood glucose levels and improving quality of life becomes more significant. In other words, EHBM

serves as an educational foundation that encourages patients to adopt healthy lifestyle behaviors, ultimately leading to positive outcomes in their clinical condition and overall quality of life.

CONCLUSION

Based on the findings and data analysis of this study, it can be concluded that education based on the Extended Health Belief Model (EHBM) has a significant impact on individuals with diabetes mellitus. There were clear differences in random blood glucose levels and patients' quality of life before and after receiving EHBM-based education. In short, EHBM has been proven to influence the reduction of blood glucose levels and the improvement of quality of life in individuals with this condition. For healthcare professionals, it is recommended to use the EHBM-based educational approach in diabetes management programs, as it has been proven to lower blood glucose levels and improve quality of life. For future researchers, it is suggested to conduct studies with a longer duration and include variables such as family support or levels of depression to broaden the understanding of the effectiveness of EHBM in diabetes management.

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