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Effectiveness of Mindfulness Based Intervention: Open Heart Prayer in Diabetic Ulcer Patients at X Bekasi Hospital

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KEYWORDS

Diabetes Mellitus, Diabetic Ulcer, MBI, Emotional Distress, Blood Sugar.

ABSTRACT

Diabetic ulcers are open wounds on the skin surface accompanied by necrotic tissue. Patients with diabetic ulcers tend to experience a significant increase in emotional distress, where individuals will feel negative emotions in daily life. This study aims to determine the effectiveness of mindfulness-based intervention: Open Heart prayer on emotional distress and blood sugar levels in diabetic ulcer patients at X Bekasi Hospital. This study used a quasi-experimental method with a two-group pre-test and post-test approach, involving 98 samples divided into a control group (49) and an intervention group (49). Open Heart prayer therapy was given 4 times a week for 4 weeks, with the research instrument being the DASS 42 questionnaire. The results showed a significant relationship between mindfulness-based intervention: Open Heart prayer in reducing emotional distress in the intervention group before and after the intervention (p-value <0.001). Diabetic ulcer patients who underwent Open Heart prayer experienced a 1-time decrease in emotional distress compared to patients who did not undergo the intervention. In addition, the decrease in emotional distress had an impact on reducing blood sugar levels (p-value <0.001). Patients who experienced a decrease in emotional distress showed a decrease in fasting blood sugar levels by 12 times (Exp (B) = 11.795) compared to patients whose emotional distress increased. Mindfulness-Based Intervention Therapy: Open Heart prayer proved to be effective in helping reduce emotional distress and fasting blood sugar levels in diabetic ulcer patients. Multivariate results showed that the risk factors of gender and degree of injury had a significant effect (p-value <0.05) in reducing emotional distress, while age and degree of DM also had a significant effect (p-value <0.05) in reducing emotional distress.

INTRODUCTION

Non-communicable diseases (NCDs) are now a significant public health problem in Indonesia, characterized by a shift in epidemiological patterns from communicable diseases that tend to decline to non-communicable diseases that are globally increasing. Nationally, diabetes mellitus (DM) and metabolic diseases have made it to the top ten diseases (Syahid, 2021). DM is a degenerative disease that is expected to increase in number. The International Diabetes Federation (IDF) estimates that in 2019, there were around 483 million people in the world aged 20-79 years with diabetes, with a prevalence of 9.3% of the total population of the same age. The presence of diabetes is expected to increase as the population ages 19.9% by

the age of 65-79 years and is predicted to reach 578 million by 2030 and 700 million by 2045 (RI, 2020).

DM is a chronic disease characterized by blood glucose levels that exceed normal. DM is often referred to as the silent killer because it is often not realized by the sufferer until complications occur. DM can attack almost all parts of the body, causing severe complications (Hestiana, 2017). In adults, DM and its complications are a global health problem and the fifth leading cause of death in the world. One of the complications often experienced by people with DM is diabetic ulcers, which are open wounds on the skin caused by ischemia, neuropathy, and infection. In Indonesia, the prevalence of diabetic ulcers is around 15%, with an amputation rate of 30% and mortality of 32%, and it is the leading cause of hospitalization for people with DM (Oktorina et al., 2019).

Diabetic ulcers often lead to feelings of embarrassment, lack of confidence, and rejection from the social environment, which can result in stress, depression, and other emotional problems in patients (Nusdin, 2022). DM patients with diabetic ulcers tend to experience emotional distress, which is a combination of depressive and anxiety symptoms that arise in response to their health condition and various medical procedures that must be undergone (Juliano & Suyasa, 2020). Emotional distress in DM patients can worsen health conditions by increasing blood sugar levels through increased production of the hormone cortisol, which reduces the body's sensitivity to insulin. (Saputra & Muflihatin, 2020).

Based on the results of interviews with diabetic ulcer patients, patients often complain that they feel embarrassed to socialize with others, patients feel less confident with their current situation, patients often have a sense of rejection by family and society, feel tired of the length of treatment and high maintenance costs due to the ulcers they currently suffer. This made the patient feel stressed, depressed, hopeless and felt alone. Patients are also burdened with economic problems due to their illness, causing emotional problems for diabetic ulcer patients.

Mindfulness, a nonjudgmental awareness of self and surroundings, can be an effective intervention to manage stress and emotional distress in patients with DM. Mindfulness practice can reduce cortisol levels and increase the production of endorphins and serotonin, which help balance organ function and reduce emotional distress (Kusumawati et al., 2021). Mindfulness-based intervention can also be part of self-care, helping individuals focus on what is being experienced and solve problems more calmly and clearly (Dwidiyanti & Wiguna, 2018).

In research, (Hofmann & Gómez, 2017), Mindfulness-Based Intervention (MBI) is very diverse, including Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT). MBI has been tested on 12,145 patients with various disorders; the results showed that MBI is more effective in reducing the severity of psychological symptoms. Mindfulness-Based Intervention: Open Heart Prayer is an interfaith prayer aimed at all people who want to open their hearts more to God. Open heart prayer is asking God's blessing so that feelings and negative emotions can be reduced, as well as a sense of peace, a heart full of tranquility, and full sincerity in accepting the current situation or condition. Open heart prayer is included in mindfulness-based therapy, which can be done by simply listening and following the instructions of the structured prayer voice through audio media; prayers can be done repeatedly (Van Der Zwan et al., 2015).. Based on previous research, MBI: Open Heart Prayer was given to HIV AIDS patients, and after 6 weeks, there was a decrease in

depression levels with a p-value <0.05 and obtained a simultaneous influence between MBI: Doa Buka Hati, age, gender, education level, length of diagnosis, stigma, family support on changes in depression by 90%. (Latipah et al., 2020a).

It will all affect the autonomic nervous system by inhibiting stretch receptor signals and hyperpolarizing currents through neural and non-neural networks by synchronizing neural elements in the heart, lungs, limbic system, and cerebral cortex. This situation will cause changes in the body's response such as a decrease in pulse rate, blood pressure, oxygen consumption, body metabolism, lactate production, and a person feels a feeling of calm, comfort, sincerity, and reduced depression (Latipah, 2018).

The adaptation theory developed by Callista Roy describes how an individual can be aware and accept his current condition by emphasizing physical and psychological aspects to form adaptive behavior. When providing mindfulness interventions, it is hoped that a person has the ability to coping mechanisms and control processes through physiological adaptation, namely the physical ability of individuals to respond to stimuli, adaptation of self-concept, and psychological abilities (feelings).

Based on the above explanation, diabetic ulcer is a complication of diabetes mellitus (DM) that has physical, psychological, social, and economic impacts on patients. Physical impacts include foot deformity, pain, infection, and amputation, while psychological impacts include anxiety, stress, and depression caused by the long healing process and fluctuating blood sugar levels. This study aims to assess the effectiveness of a mindfulness-based intervention, namely ‘open heart prayer’, in reducing emotional distress and blood sugar levels in diabetic ulcer patients. This study also has the benefit of benefiting students, educational institutions, the nursing profession, and patients by increasing understanding and skills related to this intervention.

RESEARCH METHOD

This study used a quasi-experimental design with a two-group pre-test - post-test approach to examine the causal relationship between the intervention and the outcome by comparing the experimental group that received the mindfulness intervention and the control group that did not experience the manipulation. The study population was type 2 diabetes mellitus (DM) patients with chronic diabetic ulcers at RS X Bekasi, while the sample was purposively drawn from those who met the inclusion criteria. The minimum sample was calculated using Lemeshow's formula, resulting in 49 samples for each group. The study took place at RS X Bekasi from August to September 2023 for 4 weeks. Data collection was conducted using the DASS42 questionnaire to assess emotional distress and peripheral blood sugar measurement tools. The intervention was delivered through "Doa Buka Hati" audio, and the results were measured through a comparison between the pre-test and post-test in both groups. Data were analyzed using univariate, bivariate, and multivariate analyses to evaluate the relationship between independent and dependent variables.

Hypotheses are temporary answers to problem formulations or research questions. The hypothesis in this study is:

1. Ha1: There was a difference in emotional distress between the intervention group and the control group before and after receiving the mindfulness intervention: open heart prayer.

2. Ha2: Fasting blood sugar levels differed between the intervention group and the control group
3. before and after the mindfulness intervention: open heart prayer.
4. Ha3: There is an effect of mindfulness-based intervention, such as open-heart prayer, on reducing emotional distress in the intervention and control groups.
5. Ha4: There is an effect of mindfulness-based intervention, such as open heart prayer, on reducing fasting blood sugar levels in the intervention and control groups.
6. Ha5: There is an effect of mindfulness-based intervention, open-heart prayer, and confounding variables on reducing emotional distress.
7. Ha6: There is an effect of emotional distress: open heart prayer and confounding variables on reducing fasting blood sugar levels.

RESULT AND DISCUSSION

Description of Respondent Characteristics

Demographic data on the characteristics of respondents, namely age, gender, degree of injury, and length of time suffering from diabetes mellitus based on the results of the study, are as follows:

Table 1. Distribution of diabetic ulcer patient characteristics

Respondent Characteristics	Intervention		Control		Total	
	N	%	N	%	N	%
Age						
Early Adulthood	0	0	0	0	0	0
Late Adulthood	0	0	0	0	0	0
Early Elderly	10	20.4	3	6.1	13	13.2
Late Elderly	18	36.7	15	30.6	33	33.7
Seniors	21	42.9	31	63.3	52	53.1
Gender						
Laki	15	30.6	6	12.2	21	21.4
Female	34	69.4	43	87.8	77	78.6
Duration of DM						
0 - 10 years	17	34.7	7	14.3	24	24.5
More>10 years	32	65.3	42	85.7	74	75.5
Degree of Wound						
Degree 0	0	0	0	0	0	0
1st degree	0	0	20	40.8	20	20.4
2nd degree	19	38.8	27	55.1	46	46.9
3rd degree	30	61.2	2	4.1	32	32.7
4th degree	0	0	0	0%	0	0
5th degree	0	0	0	0%	0	0

Table 1 shows the characteristics of ulcer patients aged 53.1%, female gender 78.6%, and duration of DM more than 10 years 75.5% with wound degree 2 46.9%.

This study found that the largest age group for diabetic ulcers was the elderly (>65 years), with as many as 52 respondents, with a percentage of 53.1%. Humans experience physiological changes that drastically decrease rapidly after the age of 45 years. Research results (Tofure et al., 2021) stated that in the neurological polyclinic of RSUD Dr. M Haulussy Ambon, the most diabetic ulcers were found in the elderly, as much as 71.43%, and the least in adulthood, as much as 28.57%. This is confirmed by the results of the Data and Information Center of the

Indonesian Ministry of Health (Infodatin), which states that diabetes in the elderly is 6.3% (RI, 2020). The elderly group has a high risk of suffering from diabetic ulcers. The wound healing process will take longer as age increases. The aging process occurs at that age, which decreases the ability of pancreatic beta cells to produce insulin, resulting in glucose intolerance. The aging process also decreases mitochondrial activity in muscle cells by 35%. This is associated with a 30% increase in fat content in the muscle, leading to insulin resistance (Tofure et al., 2021). Diabetic ulcers in the elderly are caused by physiologically decreased body function due to aging. Age is associated with decreased elastin and reduced collagen regeneration due to decreased cellular metabolism. Skin cells are also reduced in elasticity due to decreased vascularization fluid in the skin and reduced fatty glands, which further reduces skin elasticity. Inelastic skin will reduce cell regeneration ability when the wound begins to close, thus slowing wound healing. (Cahyaningtyas & Werdiningsih, 2022)..

The characteristics of patients based on gender in this study showed that the most significant number of patients with diabetic ulcers were women. This study's results align with research (Setyoningsih et al., 2022) which showed that 65% of patients with diabetic ulcers were women. This is because women experience decreased estrogen production and insulin resistance. The results of another study conducted at Meuraxa Banda Aceh Hospital showed that most diabetic ulcer patients were women, with a percentage of 54.4% (Abidin, 2017). This is because women tend to be more at risk of diabetes mellitus, associated with an extensive body mass index, menstrual cycle syndrome, and menopause, which results in easy accumulation of fat that inhibits the removal of glucose into cells (Tofure et al., 2021). Based on respondent data, most respondents are housewives who engage in daily activities such as going to the market, traveling outside the house for family matters, and doing community activities using flip-flops. When a wound occurs, patients tend to leave it alone because they think it is only a tiny wound without remembering that the patient has a history of DM. Sometimes, the patient does not even feel the wound, so the risk of an opening is even greater. Diabetic ulcers often occur due to a combination of neuropathy (sensory, motor, autonomic) and ischemia, this condition is exacerbated by infection. Nerve damage due to DM or diabetic neuropathy is the leading risk factor for foot ulcers because the loss of pain sensation will damage the foot directly. Peripheral nerve damage often develops slowly and is often asymptomatic. Sensory neuropathy makes the foot unable to feel anything. Using inappropriate footwear can interfere with the nerves that control body movement, thus changing the characteristics of foot posture. This causes the foot to arch and the toe to bend and puts pressure on the heel and caput metatarsal, eventually creating a thickened skin (callus) that can rupture at any time, causing an ulcer. Callus is an essential predictor of ulcers (Abidin, 2017).

The results of this study indicate that the most extended length of suffering from DM is more than 10 years. In other studies, the most common length of suffering from DM patients was >5 years for as many as 21 patients (75%), and the least was 1-5 years for as many as 7 patients (25%) (Tofure et al., 2021). The risk factor for diabetic ulcers is patients who have DM for more than 10 years. The length of time suffering from DM is related to uncontrolled blood glucose levels, which will cause chronic complications, namely neuropathy, ischemia, and angiopathy, and in some time will cause tissue death which develops into diabetic ulcers and infection (Cahyaningtyas & Werdiningsih, 2022).

The results of previous studies show that grade 2 ulcers, as much as 46.9%, are most common in diabetic ulcer patients. The results of this study are in line with research (Syarifah & Santoso, 2017) which showed that almost half (38.1%) of DM clients had second-degree gangrene wounds, and 33.3% had third-degree. Very few had first-degree and fifth-degree wounds, totaling 1.4%. The high number of stage III and IV diabetic ulcer patients is due to the lack of knowledge and attention of diabetic ulcer patients to treat their wounds when the initial wound occurs immediately. Wound ulcers are one of the complications of diabetes that still go unnoticed because patients who experience wounds when they occur at the beginning pay less attention to immediately treating diabetic ulcers. Most patients prefer to leave the wound open, assuming that "an open wound will dry quickly, and if the wound is dry, it means the wound has healed." Open wounds are susceptible to friction, trauma, and even infection, hindering the healing process of diabetic ulcers (Pujiati & Suherni, 2019). The consequences of ulcers that have already worsened can cause gangrene and lead to amputation. Only about two-thirds of ulcers heal quickly, the rest end in amputation. On average, it takes about six months for an ulcer to heal (Syarifah & Santoso, 2017).

Description of Emotional Distress of Diabetic Ulcer Patients

Table 2. Distribution of emotional distress of ulcer patients diabetic control group and intervention group, 2023

Emotional Distress	Intervention Group				Control Group			
	Pre		The post		Pre		The post	
	N	%	N	%	N	%	N	%
Normal	0	0	0	0	0	0	0	0
Lightweight	0	0	40	81.6	0	0	0	0
Medium	1	2	9	18.4	32	65.3	26	53.1
Weight	48	98	0	0	17	34.7	23	46.9
Very Heavy	0	0	0	0	0	0	0	0
Total	49	100	49	100	49	100	49	100

Table 2 shows that in the intervention group, the pre-test emotional distress level with the most significant percentage was severe emotional distress at 98%. In contrast, in the pre-test control group, moderate emotional distress occurred in 65.3% of patients. In the post-test, the level of emotional distress in the intervention group of diabetic ulcer patients decreased to mild with a percentage of 81.6%. In contrast, in the post-test control group, 53.1% remained in mild emotional distress.

Patients with diabetic ulcers generally feel embarrassed, alienated, and dissatisfied with their body condition, which causes a lack of confidence and a sense of hopelessness. This is because patients are less able to accept the changes in their bodies. These changes include the patient's body's appearance, structure, and function. Most respondents who suffer from diabetic ulcers with diabetic foot ulcers experience stress due to worsening conditions and physical changes. In addition, respondents also felt dissatisfied with the condition of the feet, which could not be as normal as before. (Kurdi et al., 2020).

The fear of amputation can also cause increased emotional distress in diabetic ulcer patients. To prevent amputation, patients must perform proper wound care. Diabetic foot ulcer treatment requires a lot of money, which impacts the economic status of the sufferer, and this is also one of the stressors for patients. In addition, diabetic foot ulcers also impact social

changes because patients experience conditions that cause pain, activity interference, and unpleasant odors (Kurdi et al., 2020).

Emotional distress affects several human factors: cognition, emotions, and social aspects. Emotional distress can affect cognitive aspects; if individuals experience stress, their way of thinking can be affected. If the emotions that arise are positive (stress), it will have a better impact. However, the impact will be less favorable if it leads to distress. Stress also affects emotions, as stress can lead to abnormal control of emotions. Emotions tend to appear together with stress, and individuals will use their emotions to evaluate their stress. In addition to cognition, stress also affects an individual's social interactions. If a person experiences eustress, their social interactions tend to improve. However, if experiencing distress, social interactions with others will tend to be negative (Wijaya, 2014).

Description of Fasting Blood Sugar Level of Diabetic Ulcer Patients

Table 3. Distribution of fasting blood sugar levels of ulcer patients diabetic control group and intervention group, 2023

Blood Sugar Levels	Intervention Group				Control Group			
	Pre		The post		Pre		The post	
	N	%	N	%	N	%	N	%
Hypoglycemia	0	0	0	0	0	0	0	0
Normal	0	0	0	0	0	0	0	0
Hyperglycemia	49	100	49	100	49	100	49	100
Total	49	100	49	100	49	100	49	100

Table 3 shows that 100% of diabetic ulcer patients in the intervention and control groups had hyperglycemia. This study shows that patients with type 2 diabetes mellitus (DM) with GDS levels >200 mg/dL have a 9,000 times higher risk of developing diabetic ulcers. Blood glucose level is used as a clinical indicator in the diagnosis of diabetes mellitus, and high blood glucose level indicates the presence of hyperglycemia, which is the main trigger of diabetes mellitus.

High glucose levels in patients with diabetes mellitus can occur due to insulin resistance, insulin deficiency, or a combination of both. Chronic hyperglycemia can cause damage and dysfunction of various organs and tissues, including nerve damage, especially the nerves of the feet. Hyperglycemia also causes blood vessels to lose the ability to contract and relax, usually resulting in reduced blood circulation to the legs. This decreased sensitivity in the feet can lead to wounds that are not felt by the patient, which can then develop into ulcers. In addition, decreased blood circulation causes the wound healing process to be inhibited, expands the wound, and triggers abscesses as a trigger for diabetic ulcers. (Umami et al., 2018).

High blood sugar levels also create a fertile environment for the development of anaerobic pathogens because the blood plasma of uncontrolled diabetes mellitus patients is highly viscous. This condition plays a role in the development of diabetic foot ulcers in patients with DM with high blood glucose levels. (Nasruddin et al., 2022)..

Bivariate Analysis

Emotional distress before and after being given open-heart prayer

Table 4. Patient emotional distress scores before and after Open Heart Prayer Intervention in Intervention and Control Groups, 2023

Variables	Measurement	Average	Difference	P Value

Emotional Distress				
Intervention	Pre	2.98	1.80	<0.001
Intervention	The post	1.18		
Emotional Distress				
Control	The post	2.47	1.29	<0.001
Intervention		1.18		

Table 4 shows that Open Heart Prayer significantly reduces emotional distress in the intervention group, with a p-value <0.05. This result is in line with research conducted by (van Son et al., 2013), which showed that emotional distress in the group given a mindfulness-based intervention significantly decreased stress levels with a p-value <0.001. Emotional distress in the intervention and control groups after the intervention also showed significant differences with a p-value <0.05.

Open Heart Prayer is an interfaith prayer designed for everyone who wants to open their heart more to God. This prayer asks for God's blessings to reduce negative emotions, resulting in peace of mind, serenity, and sincerity in accepting the current condition. This led to a significant decrease in emotional distress in the intervention group. Open Heart Prayer is included in mindfulness-based therapy, which can be done by simply listening and following the instructions of a structured prayer voice through audio media. This prayer can be repeated (Latipah et al., 2020b).

Research by Park (2013) states that Open Heart Prayer combines recorded voice/instructions, instrumental music as a prelude, deep and slow breathing techniques, and a focus on the present moment. This combination affects the autonomic nervous system by inhibiting stretch receptor signals and hyperpolarizing currents through neural and non-neural networks, which synchronize neural elements in the heart, lungs, limbic system, and cerebral cortex. This condition causes changes in the body's responses, such as a decrease in pulse rate, blood pressure, oxygen consumption, body metabolism, and lactate production, and creates a feeling of calmness, comfort, and sincerity and reduces depression.

The Open Heart Prayer intervention can inhibit sympathetic nerve activity, which reduces oxygen consumption by the body and causes muscles to relax, resulting in calm and comfort. This feeling of relaxation is then relayed to the hypothalamus to produce Corticotropin Releasing Factor (CRF), which activates the anterior pituitary to secrete enkephalins and endorphins, neurotransmitters that influence mood to be relaxed and happy. In addition, the secretion of Adrenocorticotropic Hormone (ACTH) by the anterior pituitary decreases, which in turn reduces the level of emotional distress (Rohmawati & Helmi, 2020).

This study also applied the concept model approach and adaptation nursing theory developed by Sister Callista Roy. This theory states that the level of adaptation is adjusted to the coping mechanism and control process that can be observed through four adaptation models, namely the physiological adaptation model (physical ability to respond to environmental stimuli) and self-concept adaptation (psychological and spiritual individuals). The Open Heart Prayer intervention helps patients be calmer, facilitates the adaptation process, and reduces emotional distress and fasting blood sugar levels.

Fasting blood sugar levels before and after open-heart prayer intervention

Table 5. Fasting blood sugar levels between before and after

given open heart prayer in the intervention and control groups, 2023

Variables	Measurement	Average	Difference	P Value
Decrease in Fasting Blood Sugar Levels	Pre	266	38	<0.001
Intervention	The post	228		
Decrease in Fasting Blood Sugar Levels				
Control	The post	298	70	<0.001
Intervention	The post	228		

Table 5 shows a significant decrease in fasting blood sugar levels in the intervention group before and after the Open Heart Prayer intervention with a p-value <0.05. This study's results align with research conducted by (Rohmawati and Helmi, 2020). In the intervention group, most respondents had blood sugar levels >160 mg/dL (83.3%) before the Benson relaxation-based spiritual mindfulness therapy. After the intervention, only a small proportion (63.3%) had blood sugar levels in the 81-159 mg/dL range. Meanwhile, in the control group, which only received the hospital-standard exercise, almost all respondents (90%) had blood sugar levels >160 mg/dL before the intervention, and afterward, there were still about 86.7% who still had blood sugar levels >160 mg/dL. The results also showed a significant difference between the intervention and control groups, with a p-value <0.001 (<0.05). This indicates that Open Heart Prayer is effective in reducing blood sugar levels.

The provision of the Open Heart Prayer intervention can indirectly help control the patient's blood sugar levels, although it requires a gradual process. One factor that influences the decrease in blood sugar levels is the formation of self-awareness and adaptation mechanisms that contribute to a decrease in patient emotional distress. The decreased emotional distress is considered one of the main factors causing the difference in blood sugar levels between the intervention and control groups. In addition, this intervention was also able to maintain a relaxed state through increased focus on the present, without any attempt to regret oneself, others, or the environment. This was achieved through the spiritual motivation provided in the audio intervention. (Rohmawati & Helmi, 2020).

Mindfulness also involves how one sees, feels, knows, and loves what is focused on in the present moment (JUMAROH, 2018). This approach facilitates greater centering of focus and awareness, involving attention focused on the "here and now" with a nonjudgmental attitude. It utilizes the basic units of intention, attention, and attitude, which are important in lowering blood sugar levels.

Multivariate Analysis

The effect of open heart prayer, confounding variables on reducing emotional distress

Table 6. Effect of open heart prayer, age, gender, wound degree, duration of DM on reducing emotional distress of diabetic ulcer patients in control and intervention groups 2023

Variables	Decrease in *patient's emotional distress*				*P Value*
	Down		Not Down		
	N	%	N	%	
Mindfulness-based intervention: open-heart prayer	58	59.2	40	40.8	**<0.001**

Variables	Decrease in *patient's emotional distress*				*P Value*
	Down		Not Down		
	N	%	N	%	
Intervention Group	48	82.8	1	2.5	**<0.001**
Control Group	10	17.2	39	97.5	**<0.001**
Age					
26 - 45 years	10	17.2	3	7.5	0.162
45 - >64 years	48	82.8	37	92.5	
Gender					
Male	18	31.0	3	7.5	**0.005**
Female	41	69.0	37	92.5	
Degree of Wound DM					
1st degree	28	48.3	38	95.0	**<0.001**
3rd degree	30	51.7	2	5.0	
Duration of DM					
<= 10 Years	18	31.0	6	15.0	0.070
>10 Years	40	69.0	34	85.0	

Table 6 shows a significant relationship between the open-heart prayer intervention and a decrease in emotional distress in diabetic ulcer patients (p-value <0.05). At the age of 26 - 45 years, there was a decrease in emotional distress by 17.2%, and at the age of 45 - >64 years, there was a decrease of 82.8%, with male gender at 31.0% and female gender at 69.0%. Based on the degree of diabetes mellitus injury in degree 3, with a percentage of 51.7% and a long time of suffering from diabetes mellitus, the number of respondents who suffered from DM> 10 years decreased by 69.0%. The results of statistical regression tests show that mindfulness-based interventions, such as open heart prayer, gender, and degree of injury, affect the level of emotional distress reduction.

The results of cross-tabulation in research (Syarifah & Santoso, 2017) showed that DM patients who had grade 5 gangrene wounds (100%) experienced an increase in very severe emotional distress. Changes in body function and structure will cause patients to experience disturbances in self-image. Wounds that are difficult to heal, the length of treatment, and the high cost of care and treatment cause patients to experience anxiety and role disturbances in the family. DM patients need a long time to heal wounds on the feet and need extra patience in caring for them because the stress, depression, and anxiety that arise can prolong the healing process; the length of wound healing of diabetic patients is due to related levels - cortisol levels or stress hormones cortisol levels will increase if diabetic clients are depressed or stressed and anxious.

Based on research results (Trisnawati et al., 2022), It is known that the provision of mindfulness spiritual therapy intervention based on breathing exercises has a significant effect on reducing the level of anxiety, distress, and stress of type 2 DM patients with diabetic ulcers. When a person feels mindfulness can help a person to be able to have a healthier life and not easily anxious, not easily depressed, have a better view of life, improve relationships with others, increase self-esteem, increase the resilience function of the human body, and reduce the possibility of someone to use drugs. Mindfulness-based intervention: Open heart prayer is given to raise the patient's awareness of the conditions experienced at this time without any effort to blame the environment and others, carried out with a spiritual approach that aims to foster self-awareness, increase concentration, peace of mind, for the formation of the belief that

healing comes from God Almighty through providing spiritual motivation by listening to audio sounds containing instructions to focus the mind on breathing When thoughts and feelings begin to be disturbed by the sound and burden of other thoughts, the patient listens and feels and then returns the focus to breathing and motivational sentences of gratitude, surrender, patience, and sincerity accompanied by appropriate music.

The relationship between age and duration of DM on reducing emotional distress of diabetic ulcer patients showed no significant effect after being given an open heart prayer intervention on reducing the level of emotional distress with a p-value> 0.05. In research (Livana et al., 2018), most patients are aged 25-60. At that age, a person can have the ability to control themselves in dealing with disturbances or problems in everyday life better, but it does not rule out the possibility that some people with a more mature or older age have poor self-control, so signs of psychological disorders such as stress, anxiety, and depression can appear.

Table 7. Results of multivariate logistic regression analysis of the effect of open-heart prayer and age, gender, education, degree of injury, duration of DM on reducing emotional distress, 2023

Variables	B	SE	Sign	Exp B	95% CI	
					Low	Upper
Step 1[a]						
Open Heart Prayer	-5.010	1.212	<0.001	0.007	0.001	0.072
Gender	-1.720	0.895	0.055	0.179	0.031	1.034
Degree of Wound	0.232	0.659	0.725	1.261	0.347	4.590
Constant	4.824	1.783	0.007	124.514		
Step 2[a]						
Open heart prayer	-5.229	1.084	<0.001	0.005	0.001	0.045
Gender	-1.701	0.890	0.056	0.182	0.032	1.045
Constant	5.279	1.304	<0.001	196.226		

Table 7 shows the final results of the multivariate logistic regression test, showing the effect of open-heart prayer with a p-value <0.05. The confounding variable tested after 2 stages is the only gender that affects. What happened during the open heart prayer intervention process was very influential in reducing the level of emotional distress of diabetic ulcer patients. When someone feels anxious, depressed, and stressed, the body system will work by increasing the work of sympathetic nerves in response to stress. The sympathetic nervous system works through the activation of the adrenal medulla to increase the release of epinephrine, norepinephrine, cortisol, and nitric oxide. This situation will cause changes in body responses such as increased heart rate, breathing, blood pressure, blood flow to various organs, and metabolism. The open-heart prayer intervention performed will stimulate the brain area, namely the prefrontal cortex, which is the center of emotional regulation and judgment to instruct emotional reactions. The body will respond by feeling accepting and non-judgmental. At the same time, the hippocampus and amygdala, in addition to the area for regulating emotions, are also an area of openness, blackout, and reinforcement, which will provide instructions to open up more so that individuals can release themselves in awareness, refrain from internal reactivity and increase self-acceptance to reduce emotional distress (Trisnawati et al., 2022).

The effect of emotional distress and age, gender, degree of injury, and duration of DM on reducing fasting blood sugar levels

Table 8. The effect of emotional distress and age, gender, wound degree, duration of DM on the decrease in fasting blood sugar levels of diabetic ulcer patients, 2023

Variables	Decreased blood sugar levels				*P Value*
	Down		Not Down		
	N	%	N	%	
Age					
26 - 45 years	11	84.6%	2	15.4%	**0.026**
45 - >64 years	44	51.8%	41	48.2%	
Gender					
Male	15	71.4%	6	28.6%	0.111
Female	40	51.9%	37	48.1%	
Degree of Wound DM					
1st degree	29	43.9%	37	56.1%	**<0.001**
3rd degree	26	81.3%	6	18.8%	
Duration of DM					
<= 10 Years	15	62.5%	9	37.5%	0.469
>10 Years	40	54.1%	34	45.9%	
Emotional Distress					
Not Down	9	23.1%	30	76.9%	**<0.001**
Down	46	78.0%	13	22.0%	

Table 8 shows a significant decrease in emotional distress on the decrease in fasting blood sugar levels with a p-value <0.05. In patients with Diabetes Mellitus (DM) who experience diabetic ulcers, although this disease cannot be cured, their blood sugar levels can still be controlled as long as the patient adheres to a healthy lifestyle, takes medication regularly, does physical activity, and maintains a mind that is not easily stressed, anxious, or depressed, and always thinks positively.

The statistical analysis results showed that emotional distress, age, and degree of injury affected changes in fasting blood sugar levels. Emotional distress can affect both the increase and decrease in blood sugar levels. Patients with low emotional distress tend to have lower blood sugar levels. This is due to hormonal mechanisms during stress, such as increased secretion of catecholamine hormones, glucagon, glucocorticoids, β-endorphins, and growth hormone, which can increase blood sugar levels. In addition, emotional distress causes excessive production of cortisol. Cortisol is a hormone that counteracts the effects of insulin and causes high blood sugar levels. Cortisol is an insulin antagonist, thus inhibiting glucose from entering the cells and causing increased blood sugar levels. The condition of blood sugar levels is highly dependent on hormones secreted by the adrenal glands, where, in times of stress, an increase in adrenaline hormone antagonizes insulin function and inhibits insulin-induced glucose transport in peripheral tissues.

The study also showed that gender and duration of DM had no significant effect on reducing blood sugar levels in diabetic ulcer patients after the patient's emotional distress decreased, with a p-value> 0.05. According to research (Nurmaguphita & Sugiyanto, 2019),

most respondents were female (61.4%). They had suffered from DM for more than 5 years (68.2%). The length of illness is related to the adaptation process to the problems faced. In line with research (Permana & Arum Pratiwi, 2017), the frequency distribution of length of illness in DM respondents over 10 years old shows a lower level of distress. Research (Permana & Arum Pratiwi, 2017) also found a relationship between the length of illness and level of distress in DM patients at Surakarta Islamic Hospital, with a p-value = 0.001, where the longer the disease, the lower the level of distress. This shows that the longer patients suffer from the disease, the more they understand the physical, psychological, social relations, and environmental conditions they feel.

Table 9. shows the results of multivariate logistic regression analysis evaluating the influence of emotional distress, Open Heart Prayer, age, gender, education, degree of injury, and duration of DM on the reduction of fasting blood sugar levels in 2023.

Variables	B	SE	Sign	Exp B	95% CI	
					Low	Upper
Step 1[a]						
Age	-1.193	0.900	0.185	0.303	0.052	1.772
Gender	-0.15	0.643	0.981	0.985	0.280	3.472
Degree of Wound	0.348	0.303	0.250	1.416	0.782	2.564
Emotional Distress	2.107	0.553	<0.001	8.222	2.783	24.290
Constant	-1.378	2.081	0.252	0.252		
Step 2[a]						
Age	-1.193	0.900	0.185	0.303	0.052	1.772
Degree of Wound	0.349	0.302	0.248	1.417	0.785	2.560
Emotional Distress	2.110	0.540	<0.001	8.245	2.861	23.760
Constant	-1.395	1.944	0.473			
Step 3[a]						
Age	-1.234	0.887	0.164	0.291	0.051	1.655
Emotional Distress	2.380	0.499	<0.001	10.802	4.065	28.703
Constant	-1.195	1.912	0.532	0.303		
Step 4[a]						
Emotional Distress	2.468	0.493	<0.001	11.795	4.487	31.002
Constant	-3.672	0.822	<0.001	0.025		

Table 9 In the final results of the multivariate logistic regression test, no confounding variables affect the decrease in fasting blood sugar levels. The multivariate logistic regression test results show the effect of reducing emotional distress on lowering blood sugar levels with a p-value <0.05. Changes in blood sugar levels after experiencing a decrease in emotional distress as much as 12 times (Exp (B) value = 11.795).

CONCLUSION

The conclusion of this study shows that diabetic ulcer patients, especially the elderly and women, have high levels of emotional distress and fasting blood sugar levels. After the "open heart prayer" intervention, there was a significant reduction in emotional distress and fasting blood sugar levels in the intervention group compared to the control group. The effectiveness

of the intervention was related to the variables of age, gender, degree of injury, and duration of diabetes mellitus, with gender and degree of injury being the variables that most affected emotional distress. In contrast, the degree of injury most affected the reduction in fasting blood sugar levels. Patients who received the intervention were more likely to experience a reduction in emotional distress and blood sugar levels than those who did not. Hospitals are expected to provide facilities for open-heart prayer therapy and other mindfulness audios. Educational institutions need to facilitate access to reputable journals and help students obtain intellectual property rights (IPR) for certified interventions. Respondents are expected to utilize this intervention independently, and future researchers are advised to examine other mindfulness-based therapies.

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