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Original Research

Analysis Knowledge of Spiritual Care and HbA1c Among Individual Living with Diabetes Mellitus

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ABSTRACT

Introduction: Diabetes mellitus (DM) is a metabolic disease represented by hypoglycemia due to abnormalities in insulin secretion, insulin action, or both. Normal blood glucose levels influence the healing process for DM complications. Reducing blood glucose levels can be achieved by releasing the hormone endorphin, secreted when the patient is calm and comfortable. One way to achieve self-calm is by getting spiritual care. Spiritual care is a process of healing by fulfilling spiritual needs. The objective assessment of DM is seen in hematological parameters, one of them is Glycate Haemoglobin (HbA1c). This study to identifying the analysis between the knowledge of spiritual care and HbA1c assessment.

Methods: This was a quantitative research correlation analysis design using person correlation. The dependent variable is the patient's knowledge of spiritual care, while the independent variable is HbA1C levels. The sample is 32 from 115 DM patients with new cases in RSUD Cibinong, Bogor 2022. questionnaire used to collect the knowledge of spiritual care and HbA1c assessment was taken at the same time.

Results: The results showed that the majority were female (68.8%), aged 56-65 years (46.9%), knowledge level high category (56.3%), and HbA1c levels were normal (81.3%.) Bivariate analysis has significant results in identifying the relationship between the knowledge of spiritual care and HbA1c levels in DM patients (p-value 0.02).

Conclusions: This study concludes that spirituality care can influence HbA1c assessment to a normal level. Spirituality care could be non-pharmacological therapy for DM patients.

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1. INTRODUCTION

Globally, Diabetes mellitus (DM) is known as a chronic disease that occurs in developed and developing countries. Data was obtained that 366 million people had DM in 2011, which is predicted to increase to 552 million in 2030 (American Diabetes Association, 2019). The incidence of DM in Indonesia was ranked 7th among ten countries with the highest number of sufferers, around 10.7 million. Indonesia is the only country in Southeast Asia with the most DM patients (Kemenkes, 2020). WHO data states that DM sufferers in 2018 were 10.7 million people. Indonesia is ranked 3rd in Southeast Asia at 11.3% (Federation, 2019). By the year, the disease has continued to experience a significant increase in numbers.

It has been widely studied that DM is associated with numerous complications, leading many patients to seek treatment in healthcare facilities. These complications are typically classified as microvascular, including retinopathy, nephropathy, and neuropathy, and macrovascular, such as cardiovascular disease and atherosclerosis. Anugrah

et al. (2022) found that among DM patients, neuropathy (45.6%) was the most common complication, followed by nephropathy (32.1%) and cardiovascular disorders (28.7%)(Anugrah et al., 2022).

Effective management of DM relies on maintaining stable blood glucose levels. Glycated hemoglobin (HbA1c) is a key indicator of long-term glycemic control, reflecting average blood glucose over two to three months. Under normal conditions, HbA1c constitutes approximately 4% of total hemoglobin. Elevated levels are associated with increased risks of complications (Kemenkes, 2020). Psychological factors such as anxiety and stress can impair glycemic control by inhibiting the release of endorphins, which play a role in metabolic regulation.

Most recently, spiritual care has emerged as a potential approach to reduce psychological distress and improve physiological outcomes in DM patients. Studies indicate that individuals with DM experience anxiety at rates approximately 20% higher than those without DM. A moderate correlation between spirituality and reduced distress was reported (Gugun et al., 2021), and it was found that spiritual beliefs and faith-based interventions were positively associated with improved diabetes managementOnyishi *et al.*, (2021). Furthermore, spirituality (Duke, 2021) influences coping mechanisms, expectations, and self-care behaviors in chronic disease management

In the Indonesian context, spirituality is deeply integrated into daily life and health beliefs. Spiritual care may offer patients with chronic conditions like DM a sense of meaning, motivation, and psychological support (Thapa et al., 2019). Meanwhile, past studies demonstrated that spiritual interventions led to significant improvements in HbA1c levels problems (Baharudin et al., 2019), as well as reductions in anxiety and depression(Kusnanto et al., 2020). Similarly, Baharudin et al. (2019) highlighted the role of spirituality in fostering trust, emotional expression, and patient resilience. HbA1c remains the most reliable parameter for evaluating long-term glycemic control and risk of complications (Alshareef et al., 2024).

Nurses play a central role in delivering holistic care, which includes addressing patients' spiritual needs. Integrating spiritual care into nursing practice has been shown to enhance emotional well-being and promote self-management behaviors among DM patients (Girlie et al., 2024).Preliminary observations at Cibinong Regional Hospital revealed that DM patients in the Melati 2 room often exhibited signs of anxiety, potentially affecting endorphin release and glycemic control. To those reasons above, this study was conducted with aims to investigate the relationship between spiritual care knowledge and HbA1c levels in patients with DM at Cibinong Regional Hospital. Findings from this research may inform more holistic and culturally appropriate strategies for diabetes management.

2. METHODS

2.1 Design

This study employed a quantitative, non-experimental research design using a cross-sectional approach. The objective was to analyze the relationship between diabetes mellitus (DM) patients' knowledge of spiritual care and their Hemoglobin A1c (HbA1c) levels. A cross-sectional design allows for the measurement of both variables simultaneously at a single point in time, enabling the assessment of potential associations without manipulating any variables.The study is descriptive in nature, aiming to observe, document, and explain the relationship between naturally occurring phenomena. It begins with a hypothesis proposing that there is a significant association between the level of spiritual care knowledge among DM patients and their HbA1c values.The independent variable in this research is the level of knowledge regarding spiritual care, while the dependent variable is the HbA1c level, representing glycemic control. Data collection and analysis were conducted to determine whether higher levels of spiritual care knowledge are associated with improved HbA1c outcomes.

2.2 Population, Sample and Sampling

This research was held at Cibinong Regional Hospital. Population is a large and extensive data source in certain research studies (Abubakar, 2021). The population was 115 DM patients with new cases. The sample is part of the amount and represents of the population. The sample is determined by considerations of problems, objectives, hypotheses, research methods, and instruments, as well as considerations of time and energy (Abubakar, 2021). Estimated sample size for the study:

Populations under 50 people were all taken.
Population between 50 -100 = 50%.
Population between 100-300 =25 %
Population between 300 – 500 = 10-20%
Population 500 and above = 5-15%

Based on the purposive sampling approach, a total of 32 respondents were recruited for this study. Participants were selected according to specific inclusion and exclusion criteria to ensure their relevance to the research objectives. Inclusion criteria were as follows:

(1) individuals diagnosed with diabetes mellitus,
(2) of the Muslim faith,
(3) able to communicate effectively in Indonesian, and
(4) able to read independently.

Exclusion criteria included:

(1) individuals with hearing loss or auditory disorders, and
(2) those in an emergency or medically unstable condition at the time of data collection.

Accordingly, this study utilized a purposive sampling technique, which involves the deliberate selection of participants based on specific characteristics relevant to the research

objectives(Abubakar, 2021).In purposive sampling, the researcher identifies individuals who meet predetermined criteria—in this case, patients diagnosed with diabetes mellitus who are receiving care in the Melati 2 Room at Cibinong Regional Hospital and are considered capable of providing information relevant to their knowledge of spiritual care. This method ensures that the sample aligns closely with the focus of the study, thereby enhancing the relevance and validity of the findings.

2.3 Variable

This study has an independent variable of knowledge of spiritual care and the dependent variable is HbA1c levels.

2.4 Instruments

This study utilized both primary and secondary data sources to examine the relationship between patients' knowledge of spiritual care and their HbA1c levels. Primary data were obtained through a self-developed questionnaire designed to assess the level of knowledge regarding spiritual care. Secondary data were collected through a review of patients' HbA1c test results, sourced from their medical records.

The spiritual care knowledge questionnaire consisted of 35 items distributed across four sub-variables, reflecting key dimensions of spiritual care as relevant to patients with chronic illness. These sub-variables included: (1) the concept of spiritual care, (2) spiritual needs in healthcare, (3) the role of spirituality in coping with illness, and (4) the integration of spiritual practices in daily health routines. Respondents were asked to complete the questionnaire independently, with researcher assistance provided if clarification was needed.

To ensure validity and reliability, the questionnaire underwent several stages of testing. Content validity was evaluated by a panel of experts in nursing, spiritual care, and diabetes management. The items were revised according to feedback to ensure alignment with the conceptual framework of the study. A pilot test was then conducted with a sample of DM patients who met the same inclusion criteria but were not part of the final research sample. The results of the pilot test were used to calculate Cronbach's alpha, which demonstrated acceptable internal consistency, with reliability coefficients ranging from 0.54 to 0.76 across the sub-variables. Validity scores (p-values) for individual items ranged from 0.05 to 0.00, indicating statistically significant correlations between items and their respective subscales.

The HbA1c values were obtained from the most recent laboratory results available in patients' medical records. As a biochemical marker, HbA1c provides an objective measure of glycemic control over the previous two to three months and is considered the gold standard in diabetes monitoring. The use of this standardized diagnostic tool ensured high reliability and accuracy in measuring the study's dependent variable. Together, the questionnaire and HbA1c assessment formed a comprehensive and methodologically sound framework for exploring how spiritual knowledge may relate to physiological outcomes in DM patients. This multi-method approach enhanced the depth and credibility of the data collected.

2.5 Procedure

Primary data were collected using a structured questionnaire developed by the researchers, which included items assessing the participants' knowledge of spiritual care practices such as prayer, salat, and dhikr. The questionnaire was designed to capture both the breadth and depth of the participants' spiritual knowledge and was validated through a pilot study prior to full-scale data collection (Nasa et al., 2021). The questionnaire was administered face-to-face by trained researchers, ensuring that all participants fully understood the questions.

Secondary data on HbA1c levels were obtained from the patients' medical records. The HbA1c test, which measures the average blood glucose levels over the previous two to three months, is a widely recognized indicator of long-term glycemic control (American Diabetes Association, 2021). The HbA1c levels were categorized into normal (≤6.5%) and high (>6.5%) based on the guidelines provided by the National Glycohemoglobin Standardization Program (NGSP).

2.6 Data Analysis

Data collected in this study were processed and analyzed using Statistical Package for the Social Sciences (SPSS) version 25. Analysis was conducted in two stages: univariate and bivariate analysis, to comprehensively address the research objectives and test the proposed hypothesis. In the univariate analysis, descriptive statistics were used to summarize the distribution of each variable. This included the calculation of frequencies, percentages, means, and standard deviations to describe the demographic characteristics of respondents, such as age, gender, and education level, as well as their HbA1c levels and knowledge scores related to spiritual care. These statistics provided an overview of the sample and helped to establish the general profile of participants involved in the study.

The bivariate analysis was performed to evaluate the relationship between the independent variable (DM patients' knowledge of spiritual care) and the dependent variable (HbA1c levels). For this purpose, the Pearson product-moment correlation test was employed, as both variables were continuous and met the assumptions of normality. The Pearson correlation coefficient (r) was calculated to determine the strength and direction of the relationship between the two variables.

The decision rule for hypothesis testing was based on a significance level of 0.05 ($p < 0.05$). If the p-value obtained from the Pearson correlation test was less than 0.05, the null hypothesis (H_0) was

rejected, and the alternative hypothesis (H_a) was accepted, indicating a statistically significant correlation between knowledge of spiritual care and HbA1c levels. Conversely, a p-value greater than 0.05 indicated no significant relationship.

This analytical framework allowed the researchers to not only describe the study variables but also assess the degree to which patients' spiritual knowledge might influence or relate to their long-term glycemic control, as indicated by HbA1c measurements.

2.7 Ethical Consideration

This research adhered strictly to ethical standards for human subject research. Ethical approval was obtained from the Ethical Committee of Universitas Muhammadiyah Purwokerto, Indonesia under approval number KEPK/UMP/12/VIII/2024, confirming that the study met all necessary ethical and scientific criteria. In addition, ethical clearance and permission to conduct the study were granted by the Cibinong Regional Hospital, where the research was carried out.

Prior collecting data collection, informed consent procedures were carefully implemented to ensure participants' autonomy and understanding of the research. Written informed consent was obtained from all participants after a clear explanation of the study's purpose, procedures, potential risks, and benefits. For interviews conducted in person, verbal consent was also obtained as a supplementary step to ensure participants' continued willingness and comfort throughout the process. Participants were assured of the voluntary nature of their involvement and were informed that they had the right to withdraw from the study at any time without any negative consequences to their treatment or care. Researchers emphasized that participation or refusal to participate would not affect the medical services they received.

This study strictly followed the principles of research ethics, including respect for persons, beneficence, non-maleficence, and justice. The research team ensured that no harm came to the participants during or after the study and that the rights and dignity of all participants were respected throughout the research process. All data collected—both primary data (through questionnaires) and secondary data (HbA1c test results) were handled with the utmost confidentiality. Personal identifiers were removed or anonymized to protect participant privacy, and all information was stored securely to prevent unauthorized access. Data were used exclusively for the purposes of this research.

3. RESULTS

All data collection and analysis has been finished. Data was collected in the internal medicine ward at Cibinong Regional Hospital. Next, the data was analyzed using both univariate and bivariate analysis. The analysis are:

3.1 Univariate Analysis

1) Respondents' Characteristics.

The demographic characteristics of the study respondents are presented in Table 1. A total of 32 participants took part in the study. The gender distribution shows that the majority of respondents were female, totaling 22 individuals (68.8%), while the remaining 10 respondents (31.3%) were male. This gender disparity reflects a common pattern in healthcare settings where female patients often show higher levels of participation in health-related research and follow-up care.

In terms of age distribution, respondents ranged from 26 years to over 65 years old. The data indicates that the dominant age group was between 56–65 years, accounting for 15 individuals (46.9%). This finding is consistent with epidemiological data showing a higher prevalence of Type 2 Diabetes Mellitus (T2DM) among older adults due to cumulative lifestyle and metabolic factors.

2) Level of Spiritual Care Knowledge

The findings related to participants' knowledge of spiritual care are summarized in Table 2. The spiritual care knowledge questionnaire, developed by the researchers, was divided into four subsections, each measuring knowledge in a distinct area: general spiritual care, prayer, salat (ritual prayer), and dhikr (remembrance of God).

In the general spiritual care category, the majority of respondents (46.9%) demonstrated a moderate level of knowledge, indicating a foundational understanding of the concept and its role in healthcare. Regarding prayer, a more substantial proportion of respondents (59.4%) exhibited high levels of knowledge, suggesting that prayer is a well-understood and commonly practiced component of spirituality in the studied population.In the salat category, an even higher percentage (78.1%) demonstrated high knowledge, reflecting the central role of salat in the religious and spiritual lives of most Muslim respondents. However, in the dhikr category, the level of knowledge was moderate for the majority (65.6%), which could indicate that while dhikr is recognized, its specific health benefits and structured practice might be less familiar than prayer and salat.

Overall, when evaluating the aggregate level of spiritual care knowledge, 56.3% of respondents were found to possess a high level of knowledge, reflecting a generally well-informed study population in terms of spiritual care practices and their relevance to health.

3) HbA1c Laboratory Results

Table 3 outlines the distribution of HbA1c laboratory test results among respondents. The HbA1c test is a key indicator for long-term blood

Table 1. Demographic characteristics participants

Characteristics		Frequencies (n)	Percentages (%)
Gender			
	Male	10	31.3
	Female	22	68.8
Age			
	26-35	2	6.3
	36-45	2	6.3
	46-55	11	34.4
	56-65	15	46.9
	>65	2	6.3

Table 2. Frequency Distribution of Knowledge Level of Spiritual Care in General, Pray, Salat, and Dhikr

Variable		Frequencies (respondent)	Percentages (%)
Spiritual Care in General			
	Low	3	9.4
	Medium	15	46.9
	High	14	43.8
Knowledge of Pray			
	Low	7	21.9
	Medium	6	18.8
	High	19	59.4
Knowledge of Salat			
	Low	1	3.1
	Medium	6	18.8
	High	25	78.1
Knowledge of Dhikr			
	Low	3	9.4
	Medium	21	65.6
	High	8	25
Totally of Knowledge of Spiritual Care			
	Medium	14	43.8
	High	18	56.3

Table 3. Frequency Distribution of HbA1c Laboratory Results Assessment

Laboratory Assessment		Frequencies (respondent)	Percentages (%)
HbA1c			
	High	6	18.8
	Normal	26	81.3

Table 4. Analysis of the Level of Knowledge of Spiritual Care and Implementation of Prayer

Knowledge of Spiritual Care	HbA1c				Freq (n)	Percentage (%)	P Value
	Normal		High				
	N	%	N	%			
Medium	14	43.8	0	0	14	43.8	
High	12	37.5	6	18.8	18	56.3	0.02
Total	26	81.3	6	18.8	32	100	

glucose control and is commonly used to assess diabetes management. In this study, HbA1c levels were categorized into "normal" (≤6.5%) and "high" (>6.5%), following international standards set by diabetes care guidelines.

The results reveal that a significant proportion of respondents—26 individuals (81.3%)—had HbA1c levels within the normal range, indicating relatively controlled blood glucose levels over the preceding two to three months. Only 6 respondents (18.7%) had elevated HbA1c values, which may point to less effective glycemic control or challenges in diabetes self-management. Due to the absence of sufficient references or clear clinical delineations for categorizing "low" HbA1c values, the analysis in this study focused solely on the normal and high categories.

This predominance of normal HbA1c results suggests that a majority of the study participants may have been engaging in effective diabetes management practices. Furthermore,

the potential association between spiritual care knowledge and glycemic control—reflected in these HbA1c values—will be examined further in the bivariate analysis presented in the following section.

3.2 Bivariate Analysis

The bivariate analysis aimed to determine the relationship between the level of knowledge regarding spiritual care and HbA1c levels among diabetes mellitus (DM) patients hospitalized in the internal medicine ward at Cibinong Regional Hospital. This analysis was conducted using the Pearson correlation test, which is appropriate for evaluating the strength and direction of the linear relationship between two continuous variables—namely, spiritual care knowledge scores and HbA1c levels. Table 4 presents the results of the bivariate analysis. The data indicate a statistically significant negative correlation between patients' spiritual care knowledge and their HbA1c values, with a p-value of 0.02. This value falls below the conventional threshold for statistical significance ($p < 0.05$), suggesting a meaningful relationship between the two variables under investigation.

4. DISCUSSION

The majority of respondents were female, comprising 22 patients (68.8%), while the number of male respondents was ten patients (31.3%). This finding is consistent with previous research by Siokal et al. on the implementation of Dhuha prayers in hospitalized patients, where 72.7% of respondents were female (Brajakson Siokal, Sartika, 2019). This trend may be attributed to women being more proactive about their health, resulting in a higher likelihood of hospitalization for treatment. Agustina's research further supports this, indicating that female DM patients are more prevalent than males (62%) (Agustina & Arfika, 2021). Additionally, Hardiyanti et al.'s study on the spiritual care of DM patients found that 75.6% of respondents were female (Anugrah et al., 2022). Similarly, Arda et al. reported a female dominance of 71.6% among DM respondents (Arda et al., 2020).

The age distribution showed that the late elderly (56-65 years) were predominant (46.9%), followed by the early elderly (46-55 years) at 34.4%, with late adulthood and seniors each representing 6.3%. Agustina's research corroborates this, showing a dominant age group of 46-55 years at 45.5% (Agustina & Rosfiati, 2018). The general level of knowledge about spiritual care was moderate, with 15 respondents (46.9%). The prayer category had a high knowledge level among 19 respondents (59.4%), the Salat category was high among 25 respondents (78.1%), and the Dhikr category was moderate among 21 respondents (65.6%). Overall, total knowledge of spiritual care was highest in the high category, with 18 respondents (56.3%).

Hardiyanti's research on spiritual care in DM self-management also found a high category good spirituality, with 28 respondents (62.2%). Hardiyanti suggests that individuals with chronic illnesses like DM use spirituality to cope with illness, create a sense of purpose, reduce suffering and despair, and manage their condition effectively (Anugrah et al., 2022). The dominance of high Salat knowledge in this study is supported by Nurmaini's research, which found that prayer can be an alternative psychotherapy for Muslim patients as a therapeutic process that helps improve their mental health (Nurmaini, 2025). Anjastya and Yuniartika propose that type 2 diabetes patients use spiritual therapy in the form of Dhikr to reduce blood sugar levels in the ICU, potentially normalizing HbA1c levels(Anjastya & Yuniartika, 2022).

The HbA1c assessment is standardized by the National Glycohemoglobin Standardization Program (NGSP) and represents blood sugar levels over two to three months. In this study, 81.3% of patients had normal HbA1c levels, contrasting with Utomo et al.'s study, which found 77.3% of DM patients in Malalayang Manado had uncontrolled HbA1c levels (Utomo et al., 2015). Singh's study aligns with these findings, showing a significant correlation between HbA1c and Neutrophil Lymphocyte Ratio (NLR) in Type 2 DM patients ($p=0.01$) (D.P. Singh, Hemant Mahur, 2023). Sarihati et al. also reported that most respondents had normal HbA1c values (Embuai et al., 2019).

Another study found a valuable association between HbA1c, a biomarker for diabetic neuropathy, and various hematological parameters in T2DM patients, suggesting that effective control and monitoring could prevent or delay peripheral neuropathy complications (Alshareef et al., 2024). The bivariate analysis in this study revealed a significant relationship between knowledge of spiritual care and HbA1c levels in hospitalized DM patients ($p=0.02$). Embuai et al. also reported a meaningful relationship between self-care and HbA1c ($p=0.00$), noting that uncontrolled diabetes increases HbA1c, disrupts erythrocyte function, and can lead to complications (Embuai et al., 2019).

Hasina's study supports these findings, showing that Salah and Dhuha prayers significantly influence the meaning of life in DM patients ($p=0.000$), highlighting the importance of faith and life expectancy in managing chronic illnesses (Hasina and Putri, 2020). Hendriana and Hermansyah's research also found a significant effect of Salat on reducing fasting blood glucose levels in type 2 DM patients ($p=0.000$)(Hendriana & Hermansyah, 2017). Others study that title of spirituality domain and spirituality of T2D showed that there was positive correlation among personal, environmental, communal, and transcendental domains and spirituality (0.577; 0.574; 0.512; 0.727; $p<0.001$). Their concluded that

diabetes mellitus patients cannot be separated from spiritual aspect which covers four spirituality domains (Antoni et al., 2022).

The findings of this study demonstrate a significant relationship between spiritual care knowledge and glycemic control, as indicated by HbA1c levels among patients with DM. These results align with previous research that underscores the importance of spiritual care in managing chronic illnesses, particularly DM, where psychological and emotional factors play a crucial role in disease management (Gu et al., 2023).This result implies that as the level of knowledge about spiritual care increases, there is a tendency for HbA1c levels to decrease, indicating better glycemic control. In other words, patients who possess a higher understanding of spiritual care practices—such as prayer, salat, dhikr, and other forms of religious or spiritual engagement—are more likely to exhibit improved long-term blood glucose regulation, as measured by HbA1c.

The correlation observed in this study aligns with previous findings in the literature suggesting that spirituality and spiritual well-being are associated with better self-management behaviors, reduced stress, and improved physiological outcomes among individuals with chronic diseases, including diabetes. The likely mechanism involves the calming and reassuring effects of spiritual practices, which may reduce anxiety, promote emotional stability, increase self-efficacy, and ultimately influence metabolic processes such as blood glucose regulation.

Recent empirical studies provide physiological explanations for the observed relationship between spiritual care and improved glycemic control. Spiritual practices such as salat, dhikr, and prayer have been shown to reduce psychological stress, which plays a critical role in metabolic regulation. Stress activates the hypothalamic-pituitary-adrenal (HPA) axis and sympathetic nervous system, leading to increased cortisol and catecholamine levels, both of which can impair insulin sensitivity and promote hyperglycemia. Spiritual care interventions help mitigate these effects by fostering emotional calmness, reducing anxiety, and promoting a sense of inner peace and purpose (Kusnanto et al., 2020). A quasi-experimental study pre and posttest by Kusnanto et al. demonstrated that spiritual-based interventions significantly reduced HbA1c levels. Self- efficacy and self-care influence become essential contributors in developing self-management abilities.

One of the most notable aspects of the study is the high level of knowledge about salat among participants and its significant association with lower HbA1c levels. This finding is consistent with other studies that have highlighted the physical and psychological benefits of regular salat, which involves physical movements that can improve circulation, insulin sensitivity, and overall metabolic health. The ritualistic and meditative aspects of salat may also promote mental clarity and emotional stability, further contributing to improved health outcomes (Alramadhan et al., 2023). In addition, this study underscores the potential value of integrating spiritual care into the holistic management of diabetes in clinical settings. The significant association between spiritual care knowledge and HbA1c highlights the importance of educating patients not only about medical and lifestyle aspects of diabetes management but also about the supportive role of spirituality in achieving better health outcomes.

While this study provides valuable insights into the relationship between spiritual care knowledge and HbA1c levels in diabetes mellitus (DM) patients, several limitations should be acknowledged to guide the interpretation of the results and inform future research. This study involved only 32 respondents from a single hospital, which limits the generalizability of the findings. A small sample size reduces statistical power and may not fully represent the broader population of DM patients across different regions, cultures, or healthcare settings. The use of a cross-sectional research design limits the ability to draw causal inferences. While the study found a significant correlation between spiritual care knowledge and HbA1c levels, it cannot determine whether increased knowledge leads to better glycemic control or vice versa. Longitudinal studies are needed to establish temporal relationships. Data collection was conducted exclusively at Cibinong Regional Hospital, which may introduce institutional or regional biases. Spiritual practices, health literacy levels, and diabetes management behaviors may vary significantly across different healthcare settings, religious communities, or demographic groups in Indonesia and beyond. The spiritual care knowledge variable was measured using a self-administered questionnaire. Despite efforts to ensure its validity and reliability, self-reported data may be subject to response bias, including social desirability bias, especially on topics related to religion and spirituality. The questionnaire primarily focused on Islamic spiritual practices such as salat, dhikr, and prayer, as the study population was predominantly Muslim. While culturally appropriate, this focus limits the applicability of the findings to individuals of other faiths or those who identify as spiritual but not religious. Broader instruments could capture more inclusive spiritual dimensions in future studies.Several factors that may influence HbA1c levels—such as dietary patterns, medication adherence, stress levels, physical activity, and access to healthcare—were not controlled for in this study. These confounders could impact the observed relationship between spiritual knowledge and glycemic control. Although the study assessed knowledge of spiritual care, it did not directly measure the frequency or intensity of

actual spiritual practices. Future study should consider incorporating behavioral indicators of spirituality to strengthen the evidence of its relationship with health outcomes.

Despite these limitations, the study provides an important starting point for understanding how spiritual care knowledge may contribute to the holistic management of DM. Future research should aim to address these limitations through larger, multi-center studies with more comprehensive assessments of both spirituality and diabetes management behaviors.

5. CONCLUSION

In conclusion, the findings of this study reveal a significant association between knowledge of spiritual care and HbA1c levels in patients with diabetes mellitus (DM). Specifically, patients who demonstrated a higher level of knowledge regarding spiritual care practices, such as prayer, salat, dhikr, and general spiritual principles, showed better glycemic control as indicated by normal HbA1c levels. Suggest that knowledge of spiritual care plays a meaningful role in supporting diabetes management, potentially by helping patients cope with the emotional and psychological burdens of living with a chronic illness. Spiritual care, as guided by religious practices, may provide DM patients with a sense of comfort, peace, and hope. The act of resigning and surrendering one's suffering to God can offer psychological relief that leads to reduced stress, a known contributor to blood glucose control. By fostering a sense of emotional stability and resilience, spiritual care may enhance the patient's ability to manage their condition more effectively, even in the face of daily challenges. This sense of spiritual well-being can reduce the psychological distress that often accompanies chronic illnesses like diabetes, leading to better adherence to self-care practices, improved mental health, and, consequently, better metabolic control. Nurses and healthcare providers should be encouraged to assess and support the spiritual well-being of their patients, particularly in settings where spirituality is an important part of the cultural and religious fabric of the population.

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