Model Of Family Support, Spirituality, And Health Status Perception On The Quality Of Life Of Diabetes Mellitus Patients Undergoing Hemodialysis At Rsud Arifin Achmad, Riau Province

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ABSTRACT

Objective: Diabetes mellitus is a chronic disease with a high prevalence, affecting 19.47 million people in Indonesia in 2021 and 90,796 people in Riau Province in 2022. This study aims to analyze the influence of family support, spirituality, and health status perception on the quality of life of diabetes mellitus patients undergoing hemodialysis.
Methods: This study employed a non-experimental quantitative approach using survey methods and descriptive analysis. A total of 156 diabetes mellitus patients undergoing hemodialysis at Arifin Achmad Regional General Hospital, Riau Province, participated as the primary respondents. An intervention model was subsequently tested on 53 patients. Data were collected using questionnaires and analyzed using Partial Least Square (PLS) to evaluate the relationships between latent variables and assess the structural model.
Results: The findings indicate that family support, spirituality, and health status perception significantly impact the quality of life of diabetes mellitus patients. In the baseline measurement, spirituality was the dominant factor affecting quality of life, followed by family support and health status perception. After the intervention, the relationship with God remained the most influential factor, followed by cognitive response to illness and emotional support.
Conclusion: This study highlights the importance of a holistic approach in managing diabetes mellitus patients undergoing hemodialysis. Integrating family support, spirituality, and health education is recommended as a comprehensive strategy to enhance patients' quality of life.

KEYWORDS: Family Support, Spirituality, Health Status Perception, Quality of Life, Diabetes Mellitus, Hemodialysis.

INTRODUCTION

Diabetes Mellitus (DM) is a metabolic disorder characterized by elevated blood sugar levels, which can develop into a chronic disease and lead to severe complications if not properly managed. According to the World Health Organization, approximately 422 million people worldwide suffer from diabetes, and by 2027, it is expected to be one of the top ten causes of death globally [1]. Meanwhile, the International Diabetes Federation reported that 537 million adults aged 20-79 years were living with diabetes in 2021, with projections indicating an increase to 643 million by 2030 and 784 million by 2045 [2].

In Indonesia, the prevalence of diabetes is also alarmingly high. As of 2022, there were 41,817 reported cases, making Indonesia the country with the highest number of diabetes patients in Southeast Asia. One of the major complications of diabetes is kidney dysfunction, which necessitates long-term treatment such as hemodialysis to maintain patients' quality of life [3].

Type 2 diabetes, the most common form of diabetes, is closely associated with insulin resistance and insulin deficiency. This condition can lead to microvascular complications, including neuropathy, retinopathy, and kidney failure, significantly impairing patients' quality of life. Thus, a comprehensive approach that includes medical, psychological, and social aspects is necessary for effective diabetes management.

Previous studies have shown that poorly controlled diabetes significantly reduces patients' quality of life due to various complications. This decline in quality of life is influenced by both internal factors, such as patients' knowledge and attitudes, and external factors, such as family and social support ([4],[5]). Family support is particularly significant, encompassing not only emotional support but also practical assistance, such as accompanying patients during treatment and helping them adopt a healthy lifestyle [6].

Moreover, spirituality has been found to positively impact diabetes patients' quality of life. Research suggests that spiritual well-being reduces anxiety and depression, leading to better adherence to treatment and a healthier lifestyle [7]. An individual's

perception of their health, including their understanding of disease management, also plays a crucial role in determining their quality of life. A positive perception of illness can enhance self-efficacy and treatment adherence, ultimately contributing to improved quality of life [8]. However, despite extensive research on the effects of family support, spirituality, and health perception on diabetes patients' quality of life, few studies have examined these three factors simultaneously, particularly among diabetes patients undergoing hemodialysis.

Given the increasing prevalence of diabetes and its severe complications, such as kidney failure requiring hemodialysis, understanding the interplay between family support, spirituality, and health perception is essential. Therefore, this study aims to address the following research question: "How do family support, spirituality, and health perception influence the quality of life of diabetes patients undergoing hemodialysis at Arifin Achmad Regional Hospital, Riau Province?

METHODOLOGY
This study employs a quantitative approach using a non-experimental method to examine the relationship between family support, spirituality, health perception, and quality of life among diabetes patients undergoing hemodialysis. The research will be conducted at Arifin Achmad Regional Hospital, Riau Province, from September to October 2024, with an intervention program scheduled for March 2025. The study sample consists of 156 patients selected using Slovin's formula, with 53 participants undergoing the intervention program.

Data will be collected using questionnaires measuring family support, spirituality, health perception, and quality of life. Data analysis will be conducted using Partial Least Squares (PLS) to identify relationships between variables. Validity and reliability tests will be performed to ensure the accuracy of the research instruments, using convergent validity, discriminant validity, and Cronbach's Alpha. The research procedure includes distributing questionnaires to respondents who have provided informed consent, followed by data processing involving editing, coding, entry, and cleaning to prepare data for analysis.

RESULTS
This section presents the findings and discussion, focusing on analyzing the effects of family support, spirituality, and health perception on the quality of life of Type 2 diabetes patients undergoing hemodialysis. The study includes two measurement phases: baseline (pre-intervention) and posttest (post-intervention). Changes between these phases will be analyzed using the applied research model.

3.1 Respondent Demographics
Previous research indicates that individuals aged 46-65 years have a higher prevalence of kidney complications due to Type 2 diabetes, especially those undergoing hemodialysis. Studies show that nearly 50% of diabetes patients aged 60 and above suffer from end-stage renal disease, requiring hemodialysis [9,10]. Research suggests that women are at a higher risk of diabetes-related complications, particularly post-menopause, due to hormonal changes that worsen glucose control and increase kidney disease risk. One study found that women are more susceptible to developing Type 2 diabetes in old age and are more likely to experience diabetic nephropathy requiring hemodialysis [11]. Another study highlights that obese women are at a higher risk of developing Type 2 diabetes due to hormonal and metabolic changes [12]. This risk increases after menopause, as hormonal shifts affect glucose metabolism and insulin sensitivity, exacerbating diabetes control and increasing kidney complication risks.

The majority of respondents in this study have a high school education. Studies suggest that individuals with lower education levels may have a limited understanding of chronic disease management. Although higher education levels are associated with greater awareness of diabetes management, genetic factors, healthcare access, and medication adherence play a significant role in the risk of kidney failure complications [13]. Despite higher education improving health literacy, it does not necessarily reduce complication prevalence, as factors such as age and comorbidities have a more substantial influence on hemodialysis needs [14]. Dietary habits and lifestyles specific to ethnic groups influence the prevalence of Type 2 diabetes and its complications. For instance, Javanese people tend to consume high-carbohydrate diets, Batak people consume more animal protein and traditional alcohol, Malay people have high-fat diets, and Minangkabau people frequently consume coconut milk-based dishes. These factors contribute to diabetes and kidney complication risks ([15],[16]). However, healthcare access and education remain the primary factors in preventing complications and reducing the need for hemodialysis [17].

3.2 Measurement Model (Outer Model)
The measurement model used in this study indicates that all latent variables (family support, spirituality, health perception, and quality of life) have valid indicators, with loading factor values exceeding 0.70. This suggests that the indicators effectively measure the intended constructs. Results show that the loading factor values for each construct—family support, spirituality, health perception, and quality of life—exceed 0.70, indicating that the indicators are valid and representative of their respective constructs. Measured using Average Variance Extracted (AVE), results reveal that AVE values for each construct exceed 0.50, confirming good discriminant validity. This ensures that each construct in the model is distinct, reinforcing the reliability of the study's measurement framework. By examining the interplay between family support, spirituality, and health perception, this study aims to provide insights into improving the quality of life for diabetes patients undergoing hemodialysis.

3.2. Results of Structural Test (Inner Model)
R-Square and Model Predictive Ability Evaluation

Table 1. Baseline R-Square Model

	R Square	R Square Adjusted
Quality of Life (Y	0.373	0.360

The evaluation of the structural model indicates that the R-Square value for quality of life is 0.373, meaning that family support, spirituality, and perceived health status collectively explain approximately 37% of the variability in patients' quality of life. This value suggests that the model has a moderate predictive ability, with the remaining 63% of variation in quality of life influenced by other factors not included in this model. This finding implies that while the model is reasonably effective in explaining quality of life, additional variables should be considered for a more comprehensive analysis. Furthermore, the path coefficient analysis indicates a significant positive relationship between family support, spirituality, and perceived health status with quality of life. The path coefficient values for each variable are as follows.

Table 2. Inner Model Test Results

	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Description
Family Support (X1) -> Quality of Life (Y)	0.279	0.083	3.353	0.001	Significant
Spirituality (X2) -> Quality of Life (Y)	0.346	0.053	6.502	0.000	Significant
Health Status Perception (X3) -> Quality of Life (Y)	0.223	0.087	2.571	0.010	Significant

All these relationships are statistically significant, with T-statistics values greater than 1.96 and p-values less than 0.05, indicating that all relationships between variables are significant.

3.3. Hypothesis Testing
All relationships are statistically significant, with T-statistics values greater than 1.96 and p-values less than 0.05, indicating that all variable relationships are significant.
1.   Hypothesis 1 (Family Support → Quality of Life)
The results show that family support has a significant positive effect on the quality of life of patients, with a path coefficient of 0.279, T-statistics = 3.353, and p-value = 0.001. Therefore, Hypothesis 1 is accepted, indicating that family support significantly affects quality of life.
2.   Hypothesis 2 (Spirituality → Quality of Life)
Spirituality also exhibits a significant positive effect on quality of life, with a path coefficient of 0.346, T-statistics = 6.502, and p-value = 0.000. Consequently, Hypothesis 2 is accepted, confirming that spirituality significantly influences the quality of life of patients.
3.   Hypothesis 3 (Perception of Health Status → Quality of Life)
Perception of health status also positively affects quality of life, albeit with a smaller impact compared to family support and spirituality. The path coefficient is 0.223, T-statistics = 2.571, and p-value = 0.010. Hence, Hypothesis 3 is accepted, demonstrating a significant effect, although smaller in magnitude.

3.4. Intervention Program and Model Evaluation
The findings reveal that family support, spirituality, and perception of health status significantly influence the quality of life of diabetes mellitus patients undergoing hemodialysis. An in-depth analysis highlights that emotional support from family contributes the most to quality of life, while the connection with God is the most impactful element of spirituality. Cognitive response to illness is the most relevant indicator for perception of health status, helping patients accept their condition and manage its impact more positively.

3.5. Intervention Background
This intervention program is designed to enhance emotional support from family, spiritual connection with God, and cognitive response to illness. The selection of these aspects is based on the highest scores and the most significant influence on quality of life, as shown in the PLS analysis before the intervention.
1.   Emotional Support from Family: Teaching empathic communication skills and building stronger relationships within the family.
2.   Spiritual Connection with God: Engaging in spiritual activities that enhance inner peace and mental resilience.
3.   Cognitive Response to Illness: Providing educational programs to help patients better understand their condition and manage anxiety through positive thinking.

3.6. Intervention Program Design

This program integrates the three main variables that affect patients' quality of life: emotional support, spirituality, and health status perception. Each variable has specific activities aimed at maximizing patient well-being.

1. Emotional Support:
• Family Counseling: Teaching families to understand and meet patients' emotional needs.
• Interaction Simulation: Practical exercises to improve family-patient communication.
• Empathic Communication Training: Helping families provide more compassionate responses.
2. Spirituality:
• Spiritual Education: Teaching basic practices such as prayer, meditation, and self-reflection.
• Spiritual Guidance: Support from spiritual mentors aligned with patients' religious backgrounds.
• Spiritual Support Groups: Group discussions for sharing experiences on how spirituality helps manage stress.
3. Health Status Perception:
• Disease Education: Providing comprehensive information on diabetes mellitus and hemodialysis.
• Cognitive Counseling: Teaching patients to replace negative thoughts with a more constructive mindset.

3.7. Program Implementation

The intervention begins with patient and family recruitment through socialization and selection based on inclusion criteria. The program runs for four weeks, with sessions held two to three times per week, each lasting 60-90 minutes.

1. Week 1 : Focus on family emotional support.
2. Week 2 : Focus on spirituality.
3. Week 3: Focus on health status perception.
4. Week 4: Strengthening and evaluation.

3.8. Implementation Methods

The program employs a hybrid approach to ensure flexibility and effectiveness.

1. Face-to-Face Sessions: For activities requiring direct interaction, such as family counseling and spiritual guidance.
2. Online Sessions: For flexible educational sessions accessible through digital platforms.
3. Hybrid Approach: Combining both methods to reach more participants, including those with time or location constraints.

3.9. Program Evaluation

Baseline evaluation revealed that most respondents felt uncertain about family emotional support, lacked spiritual depth, and had negative perceptions of their health status. After the intervention, significant improvements were observed:

1. Emotional Support:
• Pre-intervention: Many respondents reported inadequate emotional support.
• Post-intervention: 225 out of 318 respondents reported improved emotional support, particularly in indicators such as "My family visits me to provide emotional support" and "My family enjoys listening to my stories."
2. Spirituality:
• Pre-intervention: Many respondents felt uncertain about their spiritual connection.
• Post-intervention: A significant increase in spiritual connection was observed, with 48 respondents reporting feeling closer to God.
3. Health Status Perception:
• Pre-intervention: Most respondents had a negative perception of their health condition.
• Post-intervention: None of the respondents rated their health perception as "poor," and 54.7% rated it as "good," especially in terms of "consequences" and "self-control."

3.10. Structural Testing

The post-test evaluation focused on the inner model, assessing the relationships between variables and the effectiveness of the intervention. The program successfully improved emotional support, spirituality, and health status perception, leading to a better quality of life for patients. However, there is still room for improvement, especially in certain indicators where some respondents remained uncertain.

Tabel 3. R-Square Model After Intervention

	R Square	R Square Adjusted
Quality of Life (Y)	0.797	0.785

The R-Square value of 0.797 indicates that the independent variables in the model account for 79.7% of the variability in patients' quality of life after the intervention. This reflects the strong predictive capability of the model.

4. Hypothesis Testing

The path coefficient analysis in the post-test reveals significant relationships between the independent variables—emotional support, relationship with God, and cognitive response to illness—and patients' quality of life

Table 4. Path Coefficient Analysis Results in Post-Test

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Emotional Support (X1) → Quality of Life (Y)	0.143	0.145	0.063	2.251	0.025
Relationship with God (X2) → Quality of Life (Y)	0.814	0.802	0.041	19.871	0.000
Cognitive Response to Illness (X3) → Quality of Life (Y))	0.223	0.22	0.089	2.515	0.012

3.8. Interpretation of Results within the Designed Model Context

The program evaluation results support the designed model, which focuses on three main variables: family emotional support, spirituality, and cognitive perception of illness. These three variables have been proven to significantly contribute to improving the quality of life of diabetes mellitus patients undergoing hemodialysis:

1. Family Emotional Support Family counseling interventions and empathetic interaction simulations effectively strengthen the role of the family as the primary support system for patients, creating a more positive and supportive environment that enhances emotional well-being and the quality of life of patients.

2. Spirituality Spiritual education and religious guidance help patients feel closer to God, find inner peace, and reduce anxiety, providing the mental strength needed to face chronic illness.

3. Cognitive Response to Illness Disease education and cognitive counseling change patients' perspectives on their health conditions, increasing motivation to undergo treatment and maintain self-care, which positively impacts their quality of life.

Overall, the program successfully improved patients' quality of life by strengthening emotional support, spirituality, and more positive perceptions of their health condition.

3.9. Conclusion of the Intervention Results

a. Intervention Effectiveness The evaluation results show that the intervention program successfully improved the quality of life of diabetes mellitus patients undergoing hemodialysis. This intervention strengthened family emotional support, enhanced spirituality, and changed cognitive perceptions of illness to be more positive. These three dimensions support each other, resulting in significant changes in patients' quality of life, both in physical, psychological, social, and environmental aspects. The program also successfully empowered patients and their families to overcome challenges, creating a holistic approach to improving patient quality of life.

b. Relevance of Results to the Model of Family Support, Spirituality, and Health Status Perception This study confirms the relevance and validity of the designed model, where family support, spirituality, and health status perception are key elements in improving patients' quality of life. The model demonstrates that family emotional support strengthens relationships and creates a supportive environment, spirituality provides inner peace, and cognitive perception of illness contributes to a more optimistic mindset. These results also show that the model can be more widely implemented for other chronic health conditions.

c. Recommendations for Wider Implementation

1. Integration into Healthcare Services This program can be adopted by hospitals and other healthcare facilities as part of support services for patients with chronic illnesses, such as diabetes mellitus undergoing hemodialysis, to provide more holistic care.

2. Development of Training Modules Developing training modules for counselors, religious leaders, medical personnel, and family members is essential to ensure consistent and effective program implementation.

3. Local Context Adaptation The program needs to be tailored to the specific needs of patients in different regions, considering cultural factors, beliefs, and available resources.

4. Long-term Monitoring Regular monitoring of patients' quality of life and program effectiveness is crucial to ensure long-term impact. Further research can improve and develop the intervention model for other chronic illnesses.

RESEARCH DISCUSSION AND MODEL EVALUATION

4.1. Discussion

The evaluation results of this intervention program show that an approach based on family emotional support, spirituality, and cognitive perception of illness significantly improves the quality of life of diabetes mellitus patients undergoing hemodialysis. This approach is supported by various previous studies that highlight the importance of these factors in managing chronic diseases.

1. Family Emotional Support The intervention results show that family emotional support greatly influences patients' emotional stability, consistent with previous studies emphasizing the importance of family presence in therapy to enhance patients' sense of security and motivation [18]. Family counseling programs and empathetic interaction simulations successfully strengthened emotional closeness, positively impacting patients' quality of life. Family involvement in providing emotional support improved the quality of life by up to 85% [19].

2. Spirituality Patients' spirituality significantly impacts their well-being. Before the intervention, many patients felt a lack of connection with God, which aligns with studies highlighting the importance of spiritual approaches in helping patients cope

with health challenges [20]. Through spiritual education and religious guidance, patients reported increased inner peace and stronger faith in facing their illness, reducing anxiety and stress. This aligns with previous research showing that spirituality enhances patients' emotional well-being [21].

3.   Cognitive Perception of Illness Disease education and cognitive counseling changed patients' perspectives on their health conditions. Previously, many patients had negative perceptions of their illness, consistent with research showing that positive perceptions improve treatment adherence [22]. With this change in perception, patients became more optimistic and motivated to undergo treatment, improving their quality of life. This intervention program proved effective in helping patients build a more adaptive mindset, consistent with previous studies emphasizing the importance of cognitive counseling in changing negative perceptions of illness [23].

Overall, the evaluation results show that interventions involving emotional support, spirituality, and cognitive perception of illness significantly improve patients' quality of life. This approach not only addresses patients' psychological and social challenges but also provides a holistic solution that empowers patients and their families. The designed model is relevant and can be implemented to manage other chronic health conditions with specific adjustments to meet patients' needs.

4.2. Family Support, Spirituality, and Health Status Perception Model on the Quality of Life of Diabetes Mellitus Patients Undergoing Hemodialysis

This model is designed to explain the relationship between family support, spirituality, and health status perception on the quality of life of diabetes mellitus patients undergoing hemodialysis. These three dimensions interact and significantly influence patients' quality of life. The intervention results show that this multidimensional approach effectively improves patients' physical, psychological, social, and environmental aspects.

a.   Family Support on the Emotional Support Dimension Family emotional support plays a crucial role in enhancing patients' quality of life. The intervention program involving family counseling, interaction simulations, and empathetic communication successfully strengthened family relationships, increased involvement, and provided better emotional support to patients. Post-test results showed that patients felt more cared for by their families, positively impacting their quality of life. Family emotional support significantly affects patients' psychological well-being [24], with 85% of patients experiencing improvement through family-based support [19].

b.   Spirituality on the Connection with God Dimension Spirituality provides inner peace, faith, and hope, essential for helping patients cope with their health challenges. The intervention program, including spiritual education, religious guidance, and spiritual discussion groups, successfully enhanced patients' connection with God. Post-test results showed that patients felt closer to God, more peaceful during worship, and had stronger faith. Spiritual therapy positively impacts patients' quality of life, with 70% of patients who incorporate spirituality into their lives reporting higher psychological well-being [20].

c.   Health Status Perception on the Cognitive Response to Illness Dimension Cognitive perception of illness plays a significant role in how patients manage their health conditions. Disease education and cognitive counseling programs successfully improved patients' views on their health conditions. Post-test results showed improvements in how patients perceived their illness, felt more in control of their health, and became more confident in undergoing therapy. Positive health perceptions increase patients' optimism in treatment, contributing to their recovery [22].
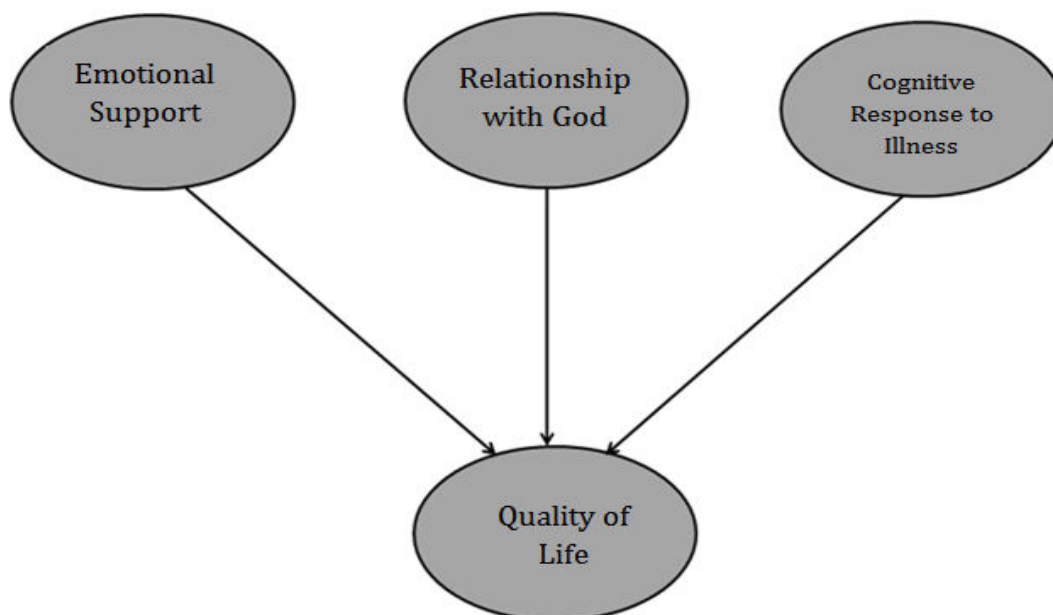

Figure 1. The Model of Family Support, Spirituality, and Health Status Perception on Quality of Life in Patients with Diabetes Mellitus Undergoing Hemodialysis

This structural model demonstrates that family emotional support, spirituality, and cognitive perception of illness significantly contribute to improving the quality of life of diabetes mellitus patients undergoing hemodialysis. These three variables work synergistically to enhance the patient's quality of life in physical, psychological, social, and spiritual aspects.

RESEARCH IMPLICATIONS

Family involvement in managing patients' health plays a crucial role in chronic diseases. Family education programs can enhance family understanding and boost patients' confidence in managing their condition. Hospitals should develop policies that provide family consultation spaces to strengthen emotional support. Spirituality also plays a significant role in a holistic approach to patient care, offering essential emotional support. Collaborating with religious communities can provide patients with inner peace and help them cope with health challenges.

Comprehensive health education is vital to improve patients' perception of their health condition. Educational programs focused on diabetes management and hemodialysis therapy can help patients better understand their condition and increase their sense of control over their health.

An integrated approach that involves family support, spirituality, and health education can holistically improve patients' quality of life. This program will enhance overall well-being, deepen patients' understanding of their health condition, and support them in managing the stress that arises from the disease. Hospital policies should support a more holistic approach to patient care, including emotional support, spirituality, and continuous education for both patients and their families. Additionally, hospitals should introduce technology to facilitate communication between patients, families, and healthcare professionals.

RESEARCH LIMITATIONS

This study has several limitations, including a limited sample size, the use of subjective questionnaires, and a cross-sectional design that cannot capture long-term changes. Future research is recommended to adopt a longitudinal or mixed-method design to obtain more comprehensive results and address these limitations.

CONCLUSION

This study aims to examine the influence of family support, spirituality, and health perception on the quality of life of diabetes mellitus patients undergoing hemodialysis at Arifin Achmad Regional General Hospital, Riau Province. The key findings of this research are as follows::
1. The majority of respondents were elderly, with a higher prevalence among women. Most had a moderate level of education, adhered to Islam, and belonged to the Javanese ethnic group, which influenced the prevalence and complications of diabetes.
2. Emotional, physical, and financial support from family significantly contributed to improving the psychological and physical well-being of patients
3. Spirituality was found to have the most significant impact on enhancing patients' quality of life by reducing stress and providing a sense of hope.
4. Although health perception had a positive effect, it was not statistically significant, indicating a smaller role compared to family support and spirituality.
5. The combination of the three variables (family support, spirituality, and health perception) explained 37.3% of the variance in quality of life at baseline and increased to 79.9% after the intervention, demonstrating a substantial contribution to improving patients' quality of life.
6. The Family Support, Spirituality, and Health Perception Model: This model showed a significant impact on patients' quality of life, with family support playing a major role in enhancing emotional and psychological well-being. Spirituality played a vital role in providing inner peace, while health perception contributed to a lesser extent.
7. The developed model proved effective in holistically improving patients' quality of life, covering physical, psychological, social, and environmental aspects. This integrated approach, which involves family support, spirituality, and health education, can also be applied to managing other chronic diseases that require long-term care.

Based on the findings that show a positive relationship between family support, spirituality, and health perception on the quality of life of diabetes mellitus patients undergoing hemodialysis, several key steps are recommended to optimize the implementation of this research::
1. Future Research Opportunities:
Further studies with a broader scope and more diverse methodologies are needed, such as exploring community support and economic factors that influence patients' quality of life. A longitudinal research design is also recommended to assess the long-term impact of family support and spirituality-based interventions.
2. Exploring Causal Relationships:
Future research should focus on deepening the causal relationship between family support, spirituality, and health perception. Developing a more specific conceptual model and testing it through quantitative or qualitative approaches based on patients' and families' experiences will provide more profound insights.
3. Health Practice Implementation
The findings of this study can serve as a foundation for developing family support and spirituality-based intervention programs in hospitals. The primary recommendation is to integrate health education, spiritual guidance, and psychological counseling into

the care of diabetes mellitus patients undergoing hemodialysis. Additionally, developing educational modules for healthcare providers and patients' families is essential to enhance the effectiveness of these interventions.

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DECLARATION OF COMPETING INTEREST

The authors declare no conflict of interest related to this research.

REFERENCES

1. World Health Organization. (2022). Global Report on Diabetes. ISBN, 978, 88. https://doi.org/ISBN 978 92 4 156525 7 IDF. (2022). IDF Annual Report 2022.
2. Riau Provincial Health Office. (2022). Riau Province Health Profile 2022.
3. Putri, Manik. (2017). Overview of Quality of Life in Patients with Diabetic Foot Ulcers in Bali. Universitas Nusantara PGRI Kediri, 01, 1–7.
4. Sidartawan, P. S. (2018). Integrated Management of Diabetes Mellitus. FKUI.
5. Arifin, & Damayanti, S. (2015). The Relationship Between Family Support and Diet Compliance in Type 2 Diabetes Mellitus Patients at the Internal Medicine Clinic of Dr. Soeradji Tirtonegoro Hospital, Klaten. Jurnal Keperawatan Respati, II(September), 1–18. http://nursingjurnal.respati.ac.id/index.php/JKRY/article/view/174/83
6. Habiburrahman, H., Hasneli, Y., & Amir, Y. (2019). The Effectiveness of Dhikr Therapy on Blood Glucose Levels in Type II Diabetes Mellitus Patients. Jurnal Ners Indonesia, 9(1), 132. https://doi.org/10.31258/jni.8.2.132-144
7. Mobini, S., Allahbakhshian, A., Shabanloei, R., & Sarbakhsh, P. (2023). Illness Perception, Self-Efficacy, and Medication Adherence in Patients With Coronary Artery Disease: A Path Analysis of Conceptual Model. SAGE Open Nursing, 9. https://doi.org/10.1177/23779608231171772
8. Koro, C., Lovre, D., Shah, S., Aanu, Sihota, &, & Fonseca, V. (2015). Association Between Diabetes and Chronic Kidney Disease in the General Population. Journal of Diabetes & Its Complications, 29(4), 424–430.
9. Russo, G. T., De Cosmo, S., Viazzi, F., Pontremoli, R., & Fioretto, P. (2018). Diabetic Kidney Disease in the Elderly: Prevalence and Clinical Correlates. BMC Geriatrics, 18(1), 38. https://doi.org/10.1186/s12877-018-0732-4
10. Huang, W. (2016). Duration of Diabetes and Risk of Diabetic Nephropathy: A Longitudinal Study. Nephrology Dialysis Transplantation, 31(5), 819–826.
11. Holt, R., Cockram, C. R., Zimmet, P., & McCarty, J. M. (2016). Textbook of Diabetes (5th Edition). Wiley-Blackwell.
12. McMurray, S., Johnson, G., Davis, S, &, & McDougall, K. (2015). Diabetes Education and Care Management Significantly Improve Patient Outcomes in the Dialysis Unit. PubMed, 40(3). https://doi.org/10.1053/ajkd.2002.34915.
13. Hesp, A., Schaub, J. A., &, & P.V., P. (2020). The Role of Renal Hypoxia in the Pathogenesis of Diabetic Kidney Disease: A Promising Target for Newer Renoprotective Agents Including SGLT2 Inhibitors?. Epub, 98(3), 579–589. https://doi.org/10.1016/j.kint
14. Septiwi, C. (2021). Diet Management Among Javanese People with Type 2 Diabetes. Jurnal Ilmiah Kesehatan Keperawatan, 17(2), 129. https://doi.org/10.26753/jikk.v17i2.669
15. Seah, J. Y. H., Sim, X., Khoo, C. M., Tai, E. S., & Van Dam, R. M. (2023). Differences in Type 2 Diabetes Risk Between East, South, and Southeast Asians Living in Singapore: The Multi-Ethnic Cohort. BMJ Open Diabetes Research and Care, 11(4), 1–9. https://doi.org/10.1136/bmjdrc-2023-003385
16. Casey, C., Buckley, C., Kearney, P., M, G., Dinneen, S, &, & T., G. (2024). Social Deprivation and Diabetic Kidney Disease: A European View. J Diabetes Investig, 15(5), 541–556. https://doi.org/10.1111/jdi.14156
17. Sari, D., Prasetyo, A. &, & Widyawati, T. (2019). The Role of Health Education and Patient Involvement in Diabetes Prevention Programs to Delay the Need for Hemodialysis in Diabetic Patients. Journal of Diabetes & Metabolic Disorders, 18(1), 65–71. https://doi.org/10.1007/s40200-019-00417-3
18. Handayani, S., Hasneli, Y., & Amir, Y. (2022). The Relationship Between Spirituality Level and Quality of Life of Diabetes Mellitus Patients During the Covid-19 Pandemic. Indonesian Journal of Nursing Research (IJNR), 5(2), 117–126. https://doi.org/10.35473/ijnr.v5i2.1820
19. Siallagan, A., Sinurat, S., & Gulo, P. (2023). Spirituality and Quality of Life of Diabetes Mellitus Patients in the Balam Medan Health Center Area. Gema Kesehatan, 15(2), 130–138. https://doi.org/10.47539/gk.v15i2.427
20. Gayatri, D., Natashia, D., Jumaiyah, W., & Kustiyuwati, K. (2022). The Relationship Between Spirituality Level and Quality of Life of Chronic Kidney Disease Patients During the Covid-19 Pandemic. Jurnal Kesehatan Komunitas, 8(2), 299–305. https://doi.org/10.25311/keskom.vol8.iss2.1178
21. Sofiani, Y., Kamil, A. R., & Rayasari, F. (2022). The Relationship Between Illness Perceptions, Self-Management, and Quality of Life in Adults with Type 2 Diabetes Mellitus. Jurnal Keperawatan Padjadjaran, 10(3), 187–195. https://doi.org/10.24198/jkp.v10i3.2135
22. Al-Kayyis, H. K., & Perwitasari, D. A. (2018). Illness Perception and Quality of Life in Type 2 Diabetes Mellitus Patients in Lampung, Indonesia. Global Journal of Health Science, 10(7), 136. https://doi.org/10.5539/gjhs.v10n7p136
23. Sari, C., Hilmi, D. &, & Purnama, D. (2023). Support of Family for Type 2 Diabetes Mellitus Patients in Primary Health Center During the Covid-19 Pandemic. Journal of Nursing Science Update (JNSU), 11(1), 100–108. https://doi.org/10.21776/ub.jik.2023.011.01.12
24. Tamornpark, R., Utsaha, S., Apidechkul, T., Panklang, D., Yeemard, F., & Srichan, P. (2022). Quality of Life and Factors Associated with a Good Quality of Life Among Diabetes Mellitus Patients in Northern Thailand. Health and Quality of Life Outcomes, 11. https://doi.org/10.1186/s12955-022-01986-y

25. Gulo, P. (2023). The Application of Spiritual Therapy to Improve the Quality of Life of Type II Diabetes Mellitus Patients. Jurnal Keperawatan, 15(1), 1–9. https://doi.org/10.32583/keperawatan.v15i1.787