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The impact of spirituality on blood glucose control among patients with type 2 diabetes mellitus in Padangsidempuan

Dampak spiritualitas dalam pengendalian glukosa darah pada penderita diabetes melitus tipe 2 di Padangsidempuan

Adi Antoni^{1*}, Abdullah AA², Anto J. Hadi³, Nur Hamdani Nur⁴

¹ Department of Nursing, Universitas Aafa Royhan, Padangsidempuan, North Sumatera, Indonesia,
E-mail: adiantoni100@gmail.com

² Department of Nursing, Universitas Aafa Royhan, Padangsidempuan, North Sumatera, Indonesia,
E-mail: jawaabdullah37@gmail.com

³ Department of Public Health, Universitas Aafa Royhan, Padangsidempuan, North Sumatera, Indonesia,
E-mail: antoarunraja@gmail.com

⁴ Department of Public Health, Universitas Pancasakti, Makassar, South Sulawesi, Indonesia,
E-mail: hamdani82nur@gmail.com

*Correspondence Author:

Department of Nursing, Universitas Aafa Royhan, Padangsidempuan, North Sumatera, Indonesia,
E-mail: adiantoni100@gmail.com

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Abstract

Diabetes mellitus (DM) is a chronic degenerative disease that requires lifelong management. Beyond biological, psychological, and social needs, spirituality is an essential dimension for individuals with chronic conditions. The number of individuals with diabetes in Padangsidempuan has steadily increased, creating a burden on health services. This study aimed to explore the role of spirituality in the lives of patients with type 2 DM. A qualitative design with a phenomenological approach was applied, involving seven Muslim participants who met the inclusion criteria of no cognitive impairment, diagnosis for at least five years, a minimum bachelor's education, and the ability to communicate effectively. The study was conducted in Padangsidempuan from January to February 2025. Data were collected through in-depth interviews using a structured guide and analyzed using Colazzi's method assisted by Open Code software. Three major themes and seven subthemes emerged: (1) Spirituality as motivation to live with diabetes (lifelong journey, spiritual motivation, acceptance of illness); (2) Nature as God's creation to relieve problems (healing power of water, nature as divine solution); and (3) Harmonious human relationships to stabilize blood glucose (peace through social interaction, charity for better control). In conclusion, spirituality played a positive role in providing motivation, reinforcing life's meaning, and fostering harmonious relationships with oneself, others, and the environment, thereby supporting better blood glucose control in patients with DM.

Keywords: Blood glucose control, diabetes mellitus type 2, diabetes management, spiritual care

Abstrak

Diabetes melitus (DM) merupakan penyakit degeneratif kronis yang harus dijalani sepanjang hidup. Selain aspek biologis, psikologis, dan sosial, spiritualitas juga menjadi bagian penting bagi individu yang menghadapi kondisi ini. Jumlah penderita diabetes di Kota Padangsidempuan terus meningkat dan menimbulkan beban pada pelayanan kesehatan. Penelitian ini bertujuan untuk mengeksplorasi peran spiritualitas dalam kehidupan penderita DM tipe 2. Penelitian menggunakan desain kualitatif dengan pendekatan fenomenologis dan melibatkan tujuh partisipan Muslim yang memenuhi kriteria inklusi, antara lain tidak mengalami gangguan kognitif, telah didiagnosis minimal lima tahun, berpendidikan sarjana, serta mampu berkomunikasi efektif. Penelitian dilaksanakan di Kota Padangsidempuan, pada Januari–Februari 2025. Data dikumpulkan melalui wawancara mendalam dengan panduan terstruktur, kemudian dianalisis menggunakan metode *Colaizzi* dengan bantuan perangkat lunak *Open Code*. Hasil penelitian menemukan tiga tema utama dengan tujuh subtema: (1) Spiritualitas sebagai motivasi hidup dengan diabetes, (2) Alam sebagai ciptaan Tuhan untuk meredakan masalah, dan (3) Hubungan harmonis antar manusia dalam menstabilkan glukosa darah. Kesimpulannya, spiritualitas berperan positif dalam memberikan motivasi, memperkuat makna hidup, serta membangun

hubungan harmonis dengan diri, orang lain, dan lingkungan, sehingga mendukung pengendalian glukosa darah yang lebih baik.

Kata Kunci: Diabetes melitus tipe 2, kontrol glukosa darah, manajemen diabetes, perawatan spiritual

Introduction

Diabetes mellitus (DM) is a chronic disease that poses a global health challenge. The number of patients with diabetes is increasing (WHO Health Organization, 2024). The International Diabetes Federation estimates that 589 million people aged 20-79 years and which is predicted to increase to 635 million in 2030 and 853 million in 2050. Three out of four adults with diabetes are from low- and middle-income countries (LMICs). Diabetes caused 3,4 deaths worldwide in 2024. Diabetes has caused health expenditures of at least USD 1,015 billion and an increase of 338% over the last 17 years. In Western Pacific countries, one in two people with diabetes are undiagnosed, and there are 2,3 million deaths due to diabetes (IDF, 2025). Prevalensi diabetes di Sumatera Utara melebihi standar rata-rata Indonesia yaitu 59,6% dengan standar 50,2% (BKPK Kemenkes, 2023).

The standard management of patients with diabetes mellitus includes dietary management, medication, and exercise (ADA, 2025). Diabetes mellitus is a chronic disease that affects patients throughout their lives (Arroyave et al., 2020). Therefore, other approaches, including education, are needed to control blood glucose levels in patients with diabetes (Antoni et al., 2023).

The self-management of diabetes mellitus cannot be separated from spiritual aspects and religiosity (Abdullah et al., 2024; Alramadhan et al., 2023; Molla et al., 2025). Studies on spirituality- and religiosity-based diabetes management are limited (Onyishi et al., 2021). Spiritual components and religiosity play important roles in self-care for diabetes mellitus (Abdullah et al., 2024; Antoni et al., 2022). Spiritual aspects can provide confidence, hope, and support (Molla et al., 2025). Spirituality can also help change a person's negative habits into positive ones (Atik et al., 2024).

Spirituality is an important component because it includes elements that strengthen humans, nature, the environment, and God (Antoni et al., 2022). Spirituality can strengthen the condition of patients who experience

decreased coping strategies (Choi & Hastings, 2019). Spirituality creates a positive attitude towards life and life experiences, increases the patient's resilience to adverse life events, including diseases (such as diabetes), and enriches life with motivation and energy (De Wit et al., 2020).

This research was conducted in Padangsidempuan City because, apart from the high prevalence of diabetes, the spiritual beliefs of the Batak Angkola and Mandailing tribes are strong. The innovation of this research is the use of spirituality in the diabetes management approach, as diabetes management requires a lifetime of care. Therefore, spirituality has become a source of innovation for those who suffer. This study aimed to explore the role of spirituality in diabetes management among individuals with diabetes mellitus in Padangsidempuan, Indonesia. This study was conducted to address a gap in the literature, as there is still limited research that specifically examines the spiritual aspects as a vital component in the management of diabetes mellitus.

Methods

Research Type

This study was quantitative in nature. This study used a phenomenological design conducted in Padangsidempuan. Phenomenological design is a qualitative research approach that aims to understand and explore the meaning of an individual's lived experience related to a specific phenomenon or event. A phenomenological design was used to explore the role of spirituality in managing blood glucose levels in patients with diabetes mellitus.

Informants

The number of participants involved was seven because the participants in this study reached data saturation. The sampling technique used purposive sampling with the following criteria: patients with type 2 diabetes mellitus, long suffering from diabetes mellitus for at least five

years since diagnosis, diabetes patients who do not experience cognitive impairment, and able to communicate verbally and non-verbally.

Research Location and Time

This study was conducted in Padangsidempuan City, an area of cultural diversity that provides a unique context for discussing spiritual issues. This study was conducted in January and February 2025.

Instruments

The instruments used In-depth interviews were conducted. Researchers conduct data triangulation to increase the validity and reliability of the data by collecting and analyzing information from various sources, methods or theories. The following is an interview guide for conducting the research:

Table 1. Interview guide

Question
How does spirituality define your life?
Does spirituality have an influence in your life? Explain!
What role does spirituality play in your life?
What spiritual roles strengthen your life?

Data Collection Procedures

In-depth interviews were conducted at the informants' homes for 30–60 minutes.

Data Analysis

Data processing was performed using the Colaizzi technique and the Open Code application. The interview data were transcribed after collection. The data were then entered into an open code application. In

the Open Code application, significant statements were manually identified, categorized, and subthemes were created and summarized into themes.

Ethical Considerations

This study adhered to ethical principles, including anonymity, confidentiality, and informed consent from each participant. This study was approved by the Ethics Committee of the Faculty of Nursing, University of North Sumatra (1723/II/SP/2025).

Result and Discussion

The results showed three themes with seven subthemes: theme 1, spirituality as motivation for living with diabetes; theme 2, God's creation as a problem remover; and theme 3, maintaining good relationships with other people can stabilize blood glucose.

Based on these findings, spirituality can be linked as a motivation for individuals with diabetes, as living with diabetes is a lifelong process, and accepting the condition can aid in its management. Furthermore, utilizing nature, as God's creation, has its own power to provide suggestions and strength for people with diabetes, such as water and the surrounding environment. Furthermore, building good relationships with others can help stabilize blood glucose levels by gathering and sharing stories and experiences. Giving alms can bring peace of mind and stabilize cortisol levels. The following is a description of the results of this study:

Table 2. Theme 1: Spirituality as motivation for living with diabetes

Sub-themes	Category	Representative quotations
Living with diabetes for the rest of your life	Must be lived forever	"...as long as you live, diabetes will never disappear from your life..." (P1)
	Making friends with diabetes	"I am sick, I have to be stronger because there is God" (P2)
	Illness as a trial	"Family and nature become reinforcements for living life" (P3)
		"Just live with this disease and be a friend so that you have enthusiasm for life" (P4)
		"illness as a trial to stay motivated" (P5)
		"You have to keep your spirits up because this disease can't go away, you have family and friends" (P6)
Spiritual	Worship	"Practice tahajut and duha prayers regularly so that

motivates life	Gardening Socialize	blood sugar is stable and enthusiasm for life" (P2) "...my spirituality is like worshiping and being optimistic about living life" (P3) "I believe that gardening is a spiritual force from God to control blood sugar" (P6) "Meeting other people can strengthen yourself in living your life and worshiping regularly" (P7)
Acceptance of diabetes	Make peace with illness Struggling with diabetes Acceptance of illness Sin disease	"Don't make diabetes difficult and don't think about it" (P1) "Diabetes is lifelong, so you have to fight forever (P2) "illness is a trial from God, you must be sincere in order to remain enthusiastic about living life" (P4) "There is a cure for every disease, the cure for diabetes is sincerity so that your sugar is stable" (P5) "Because every disease will erase sins and raise a person's status" (P7)

Table 3. Theme 2: God's creation of nature as a problem remover

Sub-themes	Category	Representative quotations
The power of water makes you healthier	Take a shower early in the morning Drink water	"I always shower at 02.00 AM in the morning so that my body is healthy (P1) "I went to take a shower before dawn and my body felt relaxed" (P4) "I always drink water at 3 in the morning before the Tahajut prayer, in the morning my body feels lighter" (P7) "I drink lots of water to stay healthy and my blood sugar is stable" (P3) "Water is God's strength to stay healthy and suffer from diabetes" (P2)
God created nature as a problem remover	Gardening Panorama Cool air temperature	"Every time you wake up, seeing the nature around you is so soothing to your soul and the fresh breeze can help you not get stressed" (P5) "I always see flowers in the garden and in pots as a stress reliever" (P3) "God's creation in the form of beautiful flowers and fruit and gardens makes the mind calm" (P6) "I always make time to go to the garden to look at fruit and vegetables so I don't think too much" (P7)

Table 4. Theme 3: Maintaining good relationships between people can stabilize blood glucose

Sub-themes	Category	Representative quotations
Gathering with other people makes you calm	Attending lectures Meet fellow DM sufferers Socialize	"I regularly attend religious studies so that my sugar is stable too (P2) "When reciting the Koran with other people, such as study friends, it creates stress and normal blood sugar" (P3) "There is a gathering activity at the community health center for fellow DM sufferers to share with each other and become aware of it and participate in it" (P6)

Giving alms
stabilizes blood
glucose

Give charity
Feeding others

"When Prolanis meets fellow diabetes friends, he becomes happy" (P5)
"with community activities, socializing, forgetting that there is diabetes" (P4)

"I routinely give alms on Fridays, it's a blessing, thank God, my sugar is stable, sir" (P3)
"If I feel like the sugar is going up, I just pray like that and when I actually feel the sugar going down" (P1)
"I often distribute food to neighbors with the intention of sharing good fortune so that I can get health from Allah" (P6)
"Islam teaches me to share with each other" (P7)
"The secret to a long life is friendship and giving charity" (P5)

Spirituality plays an important role in self-management among patients with type 2 diabetes mellitus (Syarifah et al., 2020). Patients with diabetes must live with their condition for life, which can cause stress. The stress experienced by patients with diabetes is closely related to the treatment they are undergoing, such as diet management, blood glucose control, type of treatment used, and other factors that make the patient bored (PERKENI, 2021).

This study found that spirituality motivated lifelong diabetes management. Spirituality can be a strength in accepting the disease and sustaining ongoing care. Spirituality motivates people with diabetes to live their lives, including in medical therapy (Wilmoth et al., 2025). Spirituality is an important factor in the illness experience. Diabetics with good spirituality are 8,4 times more likely to comply with diabetes management than those with poor spirituality (Dharmayanti et al., 2021).

Patients with diabetes are taught how to learn about their illnesses. Among the wisdom that exists are erasing sins, getting the reward of goodness as is usually done when healthy, getting a reward, getting a reward from heaven, and getting a high rank in the sight of Allah SWT. This is encouragement and provides calm in facing the situation (Irajpour et al., 2018). In this case, religion played an important role in the spiritual improvement of patients with diabetes (Abdullah et al., 2024).

Self-acceptance of the disease can help individuals with diabetes reduce its negative impact (Antoni et al., 2022). Self-acceptance of illness can reduce depression in patients with diabetes mellitus (DM). The results of previous research showed that the mean difference in

depression scores in the intervention group was higher than that in the control group, namely 11,64 (SD \pm 2,62) in the intervention group and 3,43 (SD \pm 2,27) in the control group (Juliana et al., 2019). A good spiritual level can reduce the negative impact of chronic wounds. Spirituality can increase a patient's sense of acceptance, maintain their resistance to illness, provide calm, increase self-confidence, and create a positive self-image (Zahara et al., 2019). The strongest spiritual component in a person is their relationship with God, who is the main source of strength for individuals with diabetes, apart from their own support, the environment, and other people (Abdullah et al., 2024; Alramadhan et al., 2023).

Allah SWT also rewards sick people, as the Apostle said, "No Muslim is pricked by a thorn or anything more than that, unless Allah records good things for him and removes from him sins" (Kementerian Agama RI, 2019). Another hadith states, "Whoever Allah wishes good for him, he will be (tested) with a calamity (HR. Bukhari) (Nawawi, 2014). It is believed that the condition of illness will be lighter when humans are always kind and grateful to Allah SWT. "Let none of you die unless he is in a state of goodwill towards Allah." (HR Bukhari & Muslim) (Nawawi, 2014). "If you are grateful, I will certainly increase your enjoyment, but if you deny My blessings, then My punishment will be very painful" (Al Quran Surah Ibrahim Verse 7)(Kementrian Agama RI, 2019).

Allah's motive in creating the entire universe and its contents was not in vain (Al Quran Surah Al Imron 191) (Kementerian Agama RI, 2019). God created nature, including water, as an antidote to disease. Water therapy

can help maintain blood glucose levels (Hikmah et al., 2021; Johnson et al., 2017). The mechanism of action of water therapy in reducing blood glucose levels involves the formation of new blood (hematopoiesis). This process occurs because water therapy activates mucosal folds (which destroy the materials that cause pollution). If the large intestine is clean, the nutrients from the food to be eaten will be absorbed by the mucous fold, and the nutrients from the food will be converted into new blood, and excess blood glucose levels in the body will be excreted through urine (Nakajima et al., 2022; Takeuchi et al., 2023).

Beautiful surroundings, such as flowers and natural views, help calm the soul and control the glucose levels. Social and ecological factors, such as cool room temperatures, affect blood glucose levels in patients with diabetes mellitus (Hasneli et al., 2024). Temperature and light can increase blood glucose levels in patients with diabetes by increasing endogenous sugar production or decreasing the tissue glucose uptake. Exposure to bright light can affect postprandial (post-meal) glucose metabolism, thermoregulation, and energy expenditure during insulin resistance (Harmsen et al., 2022).

Maintaining good relationships with others can help to stabilize blood glucose levels. Family and social support can help in controlling blood glucose levels (Onyango et al., 2023). Gathering and meeting other people can increase mental peace, provide support for individuals with diabetes, and become a support system (Carrier & Beverly, 2021). Support from fellow diabetes patients will also improve coping because they can share experiences and solutions for dealing with daily problems in diabetes sufferers (Sherifali et al., 2024).

Charity also improves the health of patients with diabetes. Giving charity increases happiness for diabetes sufferers by 87,41% (Azzahro et al., 2023). Almsgiving also has spiritual benefits, such as prolonging life, avoiding bad deaths, receiving rewards, being able to enter a special door to heaven, receiving prayers from angels, and being a predictor of mental health (Jannati et al., 2022). Allah SWT sends diseases to His servants for specific purposes. One of these is atonement for sins. People who are afflicted by an illness should continue to make efforts to cure the illness they are suffering from. Alms are a cure for human

diseases. Rasulullah saw. said, "Treat the sick among you with alms." (HR. Baihaqi) (Afifah et al., 2022).

Previous studies have not explored the qualitative influence of spirituality on blood glucose levels and diabetes management. However, previous research supports the quantitative results of this study's findings.

A limitation of this study is the difficulty in finding the right time for in-depth interviews. In addition, only seven participants were involved, which made it possible for many participants to be included in the study. Furthermore, we hope that more in-depth studies will be conducted and training modules will be created regarding the role of spirituality in diabetes management.

Conclusion

This research produced three themes with seven subthemes: Theme 1: Spirituality as motivation for living with diabetes (living with diabetes for life, spiritual motivation for life, acceptance of the disease); Theme 2: God's creation of nature as a problem remover (the power of water makes you healthier, God's creation of nature as a problem remover); Theme 3: Maintaining good relationships between people is able to stabilize blood glucose (gathering with other people makes you calm, giving alms stabilizes blood glucose).

Based on these findings, several practical suggestions can be made. Healthcare providers should integrate spiritual aspects, such as acceptance and motivation to live with diabetes, into patient education programs to improve treatment adherence and patients' emotional well-being. Finally, training healthcare professionals should include developing skills to recognize and accommodate patients' spiritual and social needs, enabling a more holistic and patient-centered approach to diabetes care. Further quantitative studies are needed to measure the impact of spirituality on the HbA1c level.

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References

- Abdullah, A., Antoni, A., & Hadi, A. J. (2024). The role of religiosity in type 2 diabetes mellitus patients: A phenomenological study. *Media Publikasi Promosi Kesehatan Indonesia*, 7(1), 1–7. <https://doi.org/10.56338/mppki.v7i10.6244>
- Afifah, A. A. N., Soleman, R., & Mulyadi, S. (2022). Penafsiran ayat dan hadits sedekah dalam perspektif Islam. *Jurnal Ekonomi Syariah*, 2(1), 1–15. <https://doi.org/10.69552/natuja.v2i1>
- Alramadhan, F., Herring, R. P., Beeson, W. L., & Nelson, A. (2023). Religiosity and type 2 diabetes self-management among Muslims residing in California. *Heliyon*, 9(9), e19725. <https://doi.org/10.1016/j.heliyon.2023.e19725>
- American Diabetes Association. (2025). Summary of revisions: Standards of care in diabetes—2025. *Diabetes Care*, 48(Suppl. 1), S6–S13. <https://doi.org/10.2337/dc25-Srev>
- Antoni, A., Decroli, E., Afriwardi, Prayitno, I., Lipoeto, N. I., Efendi, N., Mudjiran, & Hardisman. (2023). Effect of diabetes self-management education on blood sugar level control for diabetics in Padangsidempuan City. *Migration Letters*, 20(S2), 345–350. <https://doi.org/10.59670/ml.v20iS2.3692>
- Antoni, A., Ahmad, H., Hadi, A. J., & Abdullah, A. (2022). Pengaruh agama bagi penderita diabetes mellitus dalam menjalani kehidupan. *Jurnal Riset Hesti Medan Akper Kesdam I/BB Medan*, 7(2), 117. <https://doi.org/10.34008/jurhesti.v7i2.275>
- Antoni, A., Decroli, E., Prayitno, I., Lipoeto, N. I., Efendi, N., Hadi, A. J., Ritonga, N., Ahmad, H., & Antoni, A. (2022). Spirituality domains and spirituality of diabetes mellitus type 2 patients. *Journal of Positive Psychology and Wellbeing*, 6(1), 1360–1366.
- Arroyave, F., Montaña, D., & Lizcano, F. (2020). Diabetes mellitus is a chronic disease that can benefit from therapy with induced pluripotent stem cells. *International Journal of Molecular Sciences*, 21(22), 8685. <https://doi.org/10.3390/ijms21228685>
- Atik, D., Keşer, E., Yuce, U. O., & Güngör, S. (2024). Spiritual well-being, disease perception, and disease adaptation in diabetic patients in Southern Turkey: A cross-sectional study. *Cureus*, 16(6), e62659. <https://doi.org/10.7759/cureus.62659>
- Azzahro, H. U., Putri, S. A. P., & Argasiam, B. (2023). Peranan pentingnya perilaku bersedekah terhadap kebahagiaan pada donatur Lembaga Zakat Infaq Shadaqoh Bina Insani (LAZISBI) Semarang. *Jurnal IMAGE*, 3(1), 13–26. <https://unaki.ac.id/ejournal/index.php/image/article/download/509/396/1033>
- BKPK Kemenkes. (2023). *Survei Kesehatan Indonesia Tahun 2023*. Kementerian Kesehatan RI.
- Carrier, M. A., & Beverly, E. A. (2021). Focus on the positive: A qualitative study of positive experiences living with type 1 or type 2 diabetes. *Clinical Diabetes*, 39(2), 176–187. <https://doi.org/10.2337/cd20-0082>
- Choi, S. A., & Hastings, J. F. (2019). Religion, spirituality, coping, and resilience among African Americans with diabetes. *Journal of Religion and Spirituality in Social Work*, 38(1), 93–114. <https://doi.org/10.1080/15426432.2018.1524735>
- De Wit, M., Trief, P. M., Huber, J. W., & Willaing, I. (2020). State of the art: Understanding and integration of the social context in diabetes care. *Diabetic Medicine*, 37(3), 473–482. <https://doi.org/10.1111/dme.14226>
- Dharmayanti, N. M. S., Widyanthari, D. M., & Saputra, I. K. (2021). Hubungan pengalaman spiritualitas dengan perilaku self-management pada pasien diabetes melitus di Puskesmas Gianyar I. *Coping: Community of Publishing in Nursing*, 9(5), 572. <https://doi.org/10.24843/coping.2021.v09.i05.p10>
- Harmsen, J. F., Wefers, J., Doligkei, D., Schlangen, L., Dautzenberg, B., Rense, P., van Moorsel, D., Hoeks, J., Moonen-Kornips, E., Gordijn, M. C. M., van Marken Lichtenbelt, W. D., & Schrauwen, P. (2022). The influence of bright and dim light on substrate

- metabolism, energy expenditure and thermoregulation in insulin-resistant individuals depends on time of day. *Diabetologia*, 65(4), 721–732. <https://doi.org/10.1007/s00125-021-05643-9>
- Hasneli, Y., Afandi, D., & Nazriati, E. (2024). Physical environment and blood glucose level of diabetic patients: A cross-sectional study. *Journal of the Pakistan Medical Association*, 74(5 Suppl. 5), S70–S73. <https://doi.org/10.47391/JPMA.Ind-RInC-19>
- Hikmah, N., Tasalim, R., Ayu, O., & Manto, D. (2021). The effectiveness of water therapy on blood sugar levels in patients with type 2 diabetes mellitus: A narrative review. *Journal of Nursing Invention*, 2(2), 121–126. <https://doi.org/10.33859/jni.v2i2.130>
- International Diabetes Federation. (2025). *Diabetes atlas* (11th ed.). International Diabetes Federation. <https://idf.org>
- Irajpour, A., Moghimian, M., & Arzani, H. (2018). Spiritual aspects of care for chronic Muslim patients: A qualitative study. *Journal of Education and Health Promotion*, 7, 1–7. <https://doi.org/10.4103/jehp.jehp>
- Jannati, Z. (2022). Bersedekah dan kesehatan mental. *Jurnal Ilmiah Al-Syir'ah*, 14(2), 57–58. <https://doi.org/10.19109/ghaidan.v5i>
- Johnson, E. C., Bardis, C. N., Jansen, L. T., Adams, J. D., Kirkland, T. W., & Kavouras, S. A. (2017). Reduced water intake deteriorates glucose regulation in patients with type 2 diabetes. *Nutrition Research*, 43, 25–32. <https://doi.org/10.1016/j.nutres.2017.05.004>
- Juliana, W. R., Murni, A. W., & Putri, D. E. (2019). Latihan pasrah diri and modern wound dressing to reduce depression of diabetic ulcer patients. *Jurnal Keperawatan Andalas*.
- Kementerian Agama RI. (2019). *Al-Qur'an dan terjemahannya* (Edisi Penyempurnaan 2019). Lajnah Pentashihan Mushaf Al-Qur'an, Kementerian Agama RI.
- Molla, I. B., Hagger, V., & Juel, M. (2025). The role of community organisation, religion, spirituality and cultural beliefs on diabetes social support and self-management in Sub-Saharan Africa: An integrative literature review. *Journal of Religion and Health*. <https://doi.org/10.1007/s10943-024-02233-y>
- Nakajima, H., Nakanishi, N., Miyoshi, T., Okamura, T., Hashimoto, Y., Sakui, N., Sasano, R., Yamazaki, M., Hamaguchi, M., & Fukui, M. (2022). Inulin reduces visceral adipose tissue mass and improves glucose tolerance through altering gut metabolites. *Nutrition & Metabolism*, 19, 1–10. <https://doi.org/10.1186/s12986-022-00685-1>
- Nawawi, I. (2014). *Riyad as-salihin* [E-book]. Tughra Books. <https://www.simonandschuster.co.in/books/Riyad-As-Salihin/Imam-Nawawi/9781597846806>
- Onyango, J. T., Namatovu, J. F., Besigye, I. K., Kaddumukasa, M., & Mbalinda, S. N. (2023). Social support from family, associated factors and relationship with glycemic control among diabetic patients in Uganda: A cross-sectional study. *Pan African Medical Journal*, 45, 72. <https://doi.org/10.11604/pamj.2023.45.72.38256>
- Onyishi, C. N., Ilechukwu, L. C., Victor-Aigbodion, V., & Eseadi, C. (2021). Impact of spiritual beliefs and faith-based interventions on diabetes management. *World Journal of Diabetes*, 12(5), 630–641. <https://doi.org/10.4239/wjd.v12.i5.630>
- PERKENI. (2021). *Pedoman pengelolaan dan pencegahan diabetes melitus tipe 2 dewasa di Indonesia 2021*. Perkumpulan Endokrinologi Indonesia.
- Sherifali, D., Yaseen, I. F., da Silva, L. P., Jovkovic, M., Dewan, P., Khalid, S., Cader, F. A., Fitzpatrick-Lewis, D., Dakhil, Z., Alliston, P., Gyawali, B., Racey, M., & Klassen, S. (2024). Peer support for type 2 diabetes management in low- and middle-income countries (LMICs): A scoping review. *Global Heart*, 19(1), 1–20. <https://doi.org/10.5334/gh.1299>
- Syarifah, S., Nugroho, S. A., Fauzi, A. K., Munir, Z., & Wahid, A. H. (2020). Hubungan spiritual coping dengan self-monitoring pada pasien diabetes melitus tipe 2 di Poli Klinik Penyakit Dalam RSUD Waluyo Jati Kraksaan Probolinggo. *Jurnal Ners dan Kebidanan (Journal of Ners and Midwifery)*,

7(1), 89–94.
<https://doi.org/10.26699/jnk.v7i1.art.p089-094>

Takeuchi, T., Kubota, T., Nakanishi, Y., Tsugawa, H., Suda, W., Kwon, A. T., Yazaki, J., Ikeda, K., Nemoto, S., Mochizuki, Y., Kitami, T., Yugi, K., Mizuno, Y., Yamamichi, N., Yamazaki, T., Takamoto, I., Kubota, N., Kadowaki, T., Arner, E., ... Ohno, H. (2023). Gut microbial carbohydrate metabolism contributes to insulin resistance. *Nature*, 621(7978), 389–395.
<https://doi.org/10.1038/s41586-023-06466-x>

Wilmoth, S. R., Carrillo-McCracken, L. L., Wilhite, B., Pan, M., Parra-Medina, D., Sosa, E. T.,

Reyes, R., & He, M. (2025). Impacts of diabetes self-management education and support programs in Hispanic church settings: A cluster-randomized trial comparing faith-based and faith-placed approaches. *Nutrients*, 17(1), 69.
<https://doi.org/10.3390/nu17010069>

World Health Organization. (2024). *Diabetes*.
<https://www.who.int/health-topics/diabetes>

Zahara, M., Sukarni, & Usman. (2019). Hubungan antara tingkat spiritual dengan perkembangan diabetic foot ulcer (DFU) di Klinik Kitamura Pontianak. *Tanjung Pura Journal of Nursing Practice and Education*, 1, 0–8.