



Enhancing knowledge and worship quality in Muslim patients with diabetic foot ulcer through DiabetEasy

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Abstract

Diabetic foot ulcers are a complication of diabetes mellitus that can reduce the quality of life, particularly in terms of religious practices for Muslim patients in Indonesia. This program aims to improve knowledge and worship quality in Muslim patients with diabetic foot ulcers through the DiabetEasy program. This program consists of digital health education based on an application and practical worship training for relevant participants at Sultan Agung Islamic Hospital, Semarang, Indonesia. This activity showed increased understanding and worship quality after the intervention, from 60% to 90%. This indicates that this program can improve understanding and worship quality for Muslim patients with diabetic foot ulcers. This program can be an alternative option as a simple non-pharmacological therapy in promotive, preventive, and rehabilitative efforts for the management of diabetic foot ulcers.

Keywords: Diabetes mellitus; Diabetic foot ulcers; Digital health education; Worship; Muslim

Meningkatkan kualitas dan pengetahuan ibadah pasien muslim dengan ulkus kaki diabetikum melalui DiabetEasy

Abstrak

Ulkus kaki diabetik merupakan salah satu komplikasi dari diabetes mellitus yang dapat menurunkan kualitas hidup, khususnya dalam hal ibadah bagi pasien-pasien muslim di Indonesia. Program ini bertujuan untuk meningkatkan pengetahuan dan kualitas ibadah pada pasien-pasien muslim yang mengalami ulkus kaki diabetik melalui program DiabetEasy. Program ini terdiri atas edukasi kesehatan digital berbasis aplikasi dan pelatihan praktik ibadah bagi partisipan terkait di Rumah Sakit Islam Sultan Agung, Semarang, Indonesia. Hasil dari kegiatan ini menunjukkan adanya peningkatan pemahaman dan kualitas ibadah setelah intervensi pada partisipan yang semula 60% menjadi 90%. Hal ini menunjukkan bahwa program ini dapat meningkatkan pemahaman dan kualitas ibadah bagi pasien-pasien muslim dengan ulkus kaki diabetik. Program ini dapat menjadi opsi alternatif sebagai terapi non-medikamentosa dalam upaya promotif, preventif, dan rehabilitatif yang sederhana guna penanganan ulkus kaki diabetik.

Kata Kunci: Diabetes mellitus; Ulkus kaki diabetik; Edukasi kesehatan digital; Ibadah; Muslim

1. Introduction

Diabetes mellitus (DM) is a prevalent global health concern, affecting an estimated 529 million individuals worldwide (Ong et al., 2023). The burden of DM in Indonesia is substantial, with approximately 18.69 million cases reported in 2020. Diabetic foot ulcers

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(DFUs) affect 1.4% to 5.9% of individuals globally, with rates increasing to 12% in hospital settings and 24% in Indonesia (Sari et al., 2020).

Indonesia's status as one of the world's largest Muslim-majority nations, as highlighted by The Royal Islamic Strategic Studies Centre (RISSC), underscores the importance of addressing health issues within an Islamic context. In 2023, Muslims numbered 240.62 million, representing 86.7% of the country's total population of 277.53 million. This highlights the critical need for holistic health interventions grounded in Islamic principles (Sabiti et al., 2023).

The DiabetEasy program offers a solution through a digital health education application and training in religious practices tailored for Muslim patients with DFUs. This program is based on research demonstrating the positive impact of patient education on the quality of life for individuals with DFUs (Sekhar et al., 2019). iabetEasy aims to enhance patients' knowledge and improve the quality of their religious observances, addressing their spiritual needs in alignment with a holistic approach to diabetes care that encompasses physical, emotional, and spiritual dimensions (Akça Doğan et al., 2023; Sabiti et al., 2023; Sabiti & Sa'dyah, 2022; Salem et al., 2024).

The primary objective of this program is to improve the quality of life for DM patients with DFUs, particularly members of the Persatuan Diabetes Indonesia (Indonesian Diabetes Association) Semarang branch. The program emphasizes holistic care, integrating culturally and religiously sensitive digital solutions, and enhancing the quality of patients' religious experiences through an accessible and engaging application. This aligns with the association's mission to promote a holistic approach to diabetes care that encompasses physical, emotional, and spiritual dimensions (Sabiti et al., 2023; Sabiti & Sa'dyah, 2022).

2. Method

2.1. Study design and setting

This community service program was implemented at the Sultan Agung Islamic Hospital in Semarang, Indonesia, in collaboration with the Department of Informatics Engineering, Faculty of Engineering, Universitas Islam Sultan Agung; the Department of Internal Medicine, Faculty of Medicine, Universitas Islam Sultan Agung; and the Persatuan Diabetes Indonesia (Indonesian Diabetes Association). The DiabetEasy program was conducted on November 10, 2023, with 35 participants attending in person. This program reflects the Sultan Agung Islamic Hospital's commitment to holistic care and community engagement.

2.2. Program implementation

The training, conducted at the accredited Training Center of the Sultan Agung Islamic Hospital, consisted of a 3-hour session followed by personalized instruction for participants based on their specific disabilities, particularly those who had undergone amputations. A structured module facilitated the learning process. Interactive workshops enabled participants to discuss and demonstrate religious practices directly. Certificates were awarded after participants successfully demonstrated acquired competencies.

2.3. Program evaluation

To evaluate the program's effectiveness, participants completed a pre-test to assess baseline knowledge and a post-test to measure improvements in understanding and execution of religious practices. Qualitative feedback was collected through surveys or interviews to provide further insights into participants' experiences, adding depth to the quantitative findings.

2.4. Ethical considerations

This activity received ethical approval No. 15/KEPK-RSISA/I/2023. To protect their rights and confidentiality throughout the study, all participants provided informed consent.

3. Results and Discussion

The 35 participants with type 2 diabetes mellitus (Table 1), exhibited a nearly balanced gender distribution (18 males and 17 females) and a diverse age range (40-49, 50-59, and 60-70 years). Notably, 80% of participants experienced diabetic foot problems, ranging from Wagner grade 1 to 4 ulcers. Some had even undergone amputations, requiring specialized footwear and walking aids. While most (80%) already practiced *sholat* (prayer) and *wudhu* (ablution), they did not perform them correctly due to physical limitations. These demographic factors highlight the importance of considering individual circumstances in diabetes mellitus management.

Table 1. Participant characteristics

Variable		Participant
Gender	Male	18 (51.43%)
	Female	17 (48.57%)
Age	40 – 49 years	7 (20%)
	50 – 59 years	11 (31.43%)
	60 – 70 years	17 (48.57%)
Total		35 (100%)

The training included presentations on performing *sholat* and *wudhu* for patients with diabetic foot problems. Following the pre-test, training was conducted in an interactive format, with all patients participating and demonstrating the practices according to the instructions provided. Participants were then instructed to download DiabetEasy (Figure 1) online and use the application as needed. DiabetEasy was designed as an educational tool, providing comprehensive resources, including diabetes management tips, dietary guidelines, and support for religious practices adapted for patients with DFUs. The application incorporates a training curriculum for healthcare professionals, focusing on religious guidance in *wudhu*, *shalat*, and general prayers tailored to accommodate limitations caused by diabetes (Figure 2).

The session was also broadcast live on YouTube, extending the training's reach, and enabling remote access, which promoted inclusivity and support. These outcomes underscore the program's impact in empowering patients with diabetes mellitus to manage their condition and adhere to religious practices, improve self-care, increase knowledge, and enhance their quality of life.



Figure 1. DiabetEasy application interface



Figure 2. Program activities

This program is based on the understanding that effective DFU management requires a holistic approach, addressing neuropathy, arterial disease, and other factors to reduce amputation risks (Laopoulou et al., 2020; Matheson et al., 2021; Miranda et al., 2021; Raja et al., 2023). Sultan Agung Islamic Hospital emphasizes the role of Islamic worship in healthcare, especially for Muslim patients who may need guidance in faith and medical support, which helps them manage their health from physical, emotional, and spiritual aspects (Agbaria, 2024).

Post-amputation management strategies include patient acceptance, engagement in religious practices, and social support, which assist patients in overcoming emotional barriers and challenges (Roşca et al., 2021; Zhu et al., 2020). Diabetes-related amputations vary widely, from the removal to hemipelvectomy, each impacting mobility and religious practices (Ahluwalia et al., 2021; Akkus & Sert, 2022; Hicks et al., 2021). Religious guidance is essential, as many post-amputation patients desire to maintain their spiritual practices despite physical limitations (Chew et al., 2024).

Effective DFU management, including preventive care and foot hygiene, aims to reduce the risk of amputation and improve patients' quality of life (Raja et al., 2023). Neuropathy, peripheral artery disease, infection, and edema contribute to DFU development. Therefore, implementing preventive measures such as routine foot

examinations, maintaining foot hygiene, wearing appropriate footwear, and managing blood sugar levels is critical in preventing DFUs (Miranda et al., 2021). Efforts to educate patients about the importance of foot care and early detection of foot problems can help prevent the progression of DFUs to more severe stages.

DFU management requires a multidisciplinary approach to promote wound healing, prevent infection, and reduce the risk of complications. Proper wound care techniques, including wound cleaning, dressing changes, and pressure reduction from the affected area, are essential for healing and preventing infection (Matheson et al., 2021).

The DiabetEasy program, integrating holistic approaches to health and spiritual care for patients with DFUs, demonstrates results that align with previous research findings. Other research has found that participation in religious activities significantly improves the quality of life, cognitive function, and mental health (Amir et al., 2022). This program, utilizing the DiabetEasy application and interactive training, successfully increased patients' acceptance of their condition (from 60% to 90% after faith reinforcement), demonstrating the effectiveness of a holistic approach integrating medical and spiritual aspects (Agbaria, 2024; Amir et al., 2022) (Figure 3).

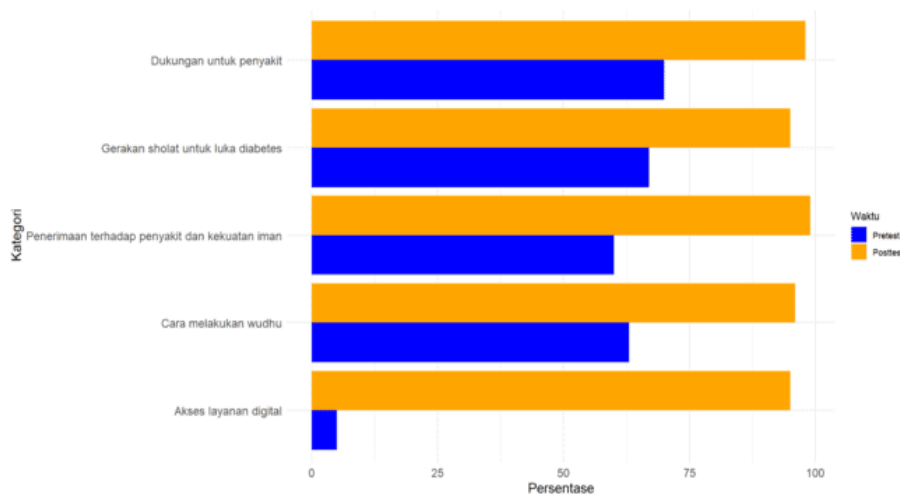


Figure 3. Pre-test and post-test results

Monitoring and evaluation of DFUs are essential components of effective management strategies. Regular foot examinations, including sensory and vascular assessments, can help detect early signs of disease and monitor its progression (Wang et al., 2022). Furthermore, using objective measures such as the Wagner classification system or the University of Texas diabetic wound classification system can help healthcare providers assess the severity of DFUs and guide treatment decisions (Jais et al., 2022; Shah et al., 2022). Furthermore, telemedicine and remote monitoring technologies can facilitate timely interventions and improve patients' quality of life by enabling healthcare providers to monitor patients remotely and intervene as needed (Haleem et al., 2021; Minty et al., 2023).

Overall, the results of this activity demonstrate DiabetEasy's success in empowering individuals with disabilities caused by diabetic foot ulcers to overcome the challenges and improve their quality of life through better self-care practices and adherence to religious worship. This program's success underscores the importance of a holistic approach to healthcare interventions, which considers both medical and spiritual aspects to support patients in achieving optimal well-being and fulfillment.

4. Conclusion

The DiabetEasy program successfully enhanced health knowledge and improved the quality of religious practices among Muslim patients with diabetic foot ulcers. Integrating comprehensive medical interventions, including education on DFU prevention and care and spiritual support through religious guidance, improved patients' acceptance of their condition and enhanced their religious practices. The results of this activity emphasize the importance of a holistic approach that considers medical and spiritual aspects in health care interventions to achieve optimal patient well-being.

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Author Contributions

Activity Implementation: NACS, SM; Article Preparation: NACS, MTS; Analysis of Community Service Impact: NACS, MTS; Presentation of Community Service Results: NACS, SM, MTS; Article Revision: NACS, SM, MTS.

Conflict of Interest

All authors declare no financial or non-financial conflicts of interest related to this article.

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