

Health Education and Diabetes Wound Care for the Elderly in Padang Pasir Village Community

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Article Information

Received: June 04, 2025

Revised: June 23, 2025

Online: June 27, 2025

Keywords

Health Education, Diabetes Mellitus, Community

ABSTRACT

Diabetes mellitus (DM) is a chronic disease that has increased significantly in the last two decades, especially in the elderly population. This study aims to design and implement a comprehensive health education and diabetic wound care program for the elderly in urban communities. Methods. This study involved 30 elderly people who suffer from type 2 diabetes mellitus and live in the Padang Pasir Village area. The research instruments consisted of a knowledge questionnaire on diabetic wound care and a foot care skills observation sheet, which had been tested for validity and reliability in a previous study. Data was collected through questionnaires that were completed before and after the intervention. Results. The average overall knowledge score increased from 57.9 10.5 at the pre-test to 82.6 8.4 at the post-test, with a difference of +24.7 points. The knowledge aspect of foot wound prevention showed the highest increase, from 58.0 9.8 to 85.5 7.5, which reflects that after education, the elderly are more aware of the importance of preventive measures such as the use of appropriate footwear and regular foot examinations. Statistical analysis using paired t-test showed that the increase in knowledge and skills of the elderly after education was significant ($p = 0.000$). Conclusion. The educational intervention designed in this study was statistically and clinically effective, and can be recommended for wider implementation as part of a strategy to improve the quality of life of elderly people with diabetes.

Keywords: Health Education, Diabetes Mellitus, Community



INTRODUCTION

Diabetes mellitus is a chronic metabolic disorder that poses a significant health challenge, particularly for the elderly population in urban communities. Characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both, diabetes can lead to a myriad of complications, including diabetic foot ulcers (DFUs) (Martha Irene, R., & Padila, P. 2021). These ulcers are a major cause of morbidity, lower-extremity amputations, and reduced quality of life among older adults. Diabetes mellitus (DM) is a chronic disease that has increased significantly in the last two decades, especially in the elderly population. Globally, the elderly are a group with a high prevalence of diabetes, caused by a combination of age factors, unhealthy lifestyles, and decreased metabolic organ function (Mobley-Bukstein et al., 2021). In Indonesia, the demographic shift towards an aging society has also led to an increase in the number of elderly diabetes sufferers.

Diabetes problems in the elderly are more complex than in other age groups. In addition to having a higher risk of complications, the elderly often experience physical, cognitive, and social limitations that hinder their ability to perform optimal self-care (Kumar et al., 2022). One of the most common complications is diabetic wounds or diabetic foot ulcers, which can lead to infection, amputation, and even death.

This problem is increasingly evident in urban areas, where the prevalence of diabetes in the elderly tends to be higher than in rural areas (Chauhan et al., 2021). This is due to sedentary lifestyles, consumption of foods high in sugar, and urban stress that worsen glycemic control. Although health facilities are more available in cities, limited time and information mean that many elderly people do not receive adequate education regarding the prevention and care of diabetic wounds.

Health education is one approach that has been proven effective in improving the ability of the elderly to carry out self-care independently. Education-based intervention programs can improve the elderly's understanding of the importance of diet, exercise, foot care, and stress management as part of diabetes control (Rodríguez & Mamani, 2021).

Previous studies have shown that structured educational interventions can improve blood sugar control and accelerate wound healing in elderly diabetics (Hajipour et al., 2022). In addition, family involvement in the education process also has a positive impact on increasing the self-efficacy of the elderly in caring for wounds (Wantonoro et al., 2023).

The use of simple technologies such as booklets, educational applications, and e-health are also starting to be considered as solutions to increase access to information for the elderly. A study of the Rawat Kaki application shows that elderly-friendly educational media can increase user understanding and satisfaction in aspects of diabetic foot care (Suyanto & Dwi Astuti, 2024). This opens up wide opportunities to develop a digital education approach in urban communities that are more technologically connected.

However, there is still a gap between the need for health education and the implementation of integrated programs in the community. Many elderly people do not fully understand how to treat diabetic wounds and when to seek medical help. Research by Ezalina et al. (2023) found that low levels of health literacy have a direct impact on low self-care behavior in elderly DM sufferers (Ezalina et al., 2023).

In the context of community service, health education programs and diabetic wound care for the elderly are a form of promotive and preventive intervention that is very relevant. In addition to

providing a direct impact on improving the quality of life of the elderly, this activity also strengthens the role of academics and health workers in bridging the gap in access and understanding of health in urban environments.

Based on these conditions, this study aims to design and implement a comprehensive health education and diabetic wound care program for the elderly in urban communities. It is hoped that this activity can be a model of community service based on scientific evidence that can be replicated in various regions with similar characteristics.

METHODS

This study uses a quantitative approach with a pre-experimental design of one group pre-test and post-test design. This approach was chosen to evaluate the effectiveness of health education programs and diabetes wound care training on improving the knowledge and skills of the elderly in performing self-care. In this design, the research subjects will be given an initial measurement (pre-test), then given an intervention in the form of health education and wound care training, and then re-measured (post-test) to see if there are any significant changes or improvements.

The population in this study were elderly people suffering from type 2 diabetes mellitus and living in the community of padang pasir village, especially in the fostered area of service partners. The sampling technique was carried out by purposive sampling with inclusion criteria, namely: elderly aged ≥ 60 years, have a history of diabetes for at least 1 year, able to communicate verbally, and willing to follow the entire series of education. The number of samples in this study was 30 people, which was determined based on the minimum requirement for statistical analysis by considering the level of confidence and the potential dropout of participants.

The research instruments were a knowledge questionnaire on diabetic wound care and a foot care skills observation sheet, which had been tested for validity and reliability in previous studies (Suyanto & Dwi Astuti, 2024). The intervention was conducted through group education sessions and hands-on demonstrations guided by the research team. Educational materials included an introduction to diabetes, foot care, early identification of wounds, and initial actions in wound care. Education was delivered using booklets and short videos that were designed to be friendly to the elderly. The intervention activities were scheduled in the morning between 08.00-10.00, which is generally the most optimal time for the elderly because their physical and cognitive conditions are still in prime condition.

Data were collected through questionnaires distributed before and after the intervention. The results of the pre-test and post-test were then analyzed statistically using the paired t-test or Wilcoxon signed-rank test depending on the distribution of the data, with a significance level of 0.05. This analysis aims to determine the differences in the knowledge and skills of the elderly before and after the educational intervention.

Research ethics are maintained through informed consent, confidentiality of participant identities, and the right of participants to withdraw at any time without consequence. This research has also received approval from the Research Ethics Committee at the organizing institution as a form of fulfillment of research ethics principles.



RESULTS

The following are the results of the study in the form of statistical description tables along with the interpretation of the data arranged correctly and precisely. Data were obtained from 30 respondents through pre-test and post-test measurements, which is a common approach in pre-experimental research. This research was conducted in the Padang Pasir Urban Village area as the intervention location :

Table 1. Descriptive Knowledge of Elderly Before and After Education

No	Measured Aspects	Pre-Test (Mean $\pm$ SD)	Post-Test (Mean $\pm$ SD)	Δ Average	Information
1	Knowledge about diabetes	60.2 $\pm$ 10.5	82.3 $\pm$ 8.7	+22.1	Significant increase
2	Diabetes wound care knowledge	55.6 $\pm$ 11.2	80.1 $\pm$ 9.1	+24.5	Significant increase
3	Foot wound prevention measures	58.0 $\pm$ 9.8	85.5 $\pm$ 7.5	+27.5	Significant increase
Average Total Knowledge Score		57.9 $\pm$ 10.5	82.6 $\pm$ 8.4	+24.7	Very good

The results of the measurement of elderly knowledge before and after being given education showed a significant increase in all aspects. The average overall knowledge score increased from 57.9 $\pm$ 10.5 at the pre-test to 82.6 $\pm$ 8.4 at the post-test, with a difference of +24.7 points. In the aspect of knowledge about diabetes, there was an increase from 60.2 $\pm$ 10.5 to 82.3 $\pm$ 8.7, indicating that participants had a better understanding of the definition of diabetes, risk factors, and the importance of controlling blood sugar levels. Knowledge about diabetic wound care also increased from 55.6 $\pm$ 11.2 to 80.1 $\pm$ 9.1, indicating an increase in the elderly's understanding of how to keep wounds from getting infected, including the principles of wound hygiene. The knowledge aspect of foot wound prevention showed the highest increase, from 58.0 $\pm$ 9.8 to 85.5 $\pm$ 7.5, which reflects that after education, the elderly are more aware of the importance of preventive measures such as the use of appropriate footwear and regular foot examinations. Overall, these data indicate that health education interventions through booklet and video media can significantly increase the knowledge of the elderly, so it is expected to have a positive impact on self-care behavior.

Table 2. Descriptive Wound Care Skills (Direct Observation)

No	Observed Aspects	Pre-Test (%) Good Performance	Post-Test (%) Good Performance	Δ (%)	Information
1	Routine self-examination of the feet	40%	86.7%	+46.7%	Increasing rapidly
2	Technique for washing and drying feet	53.3%	90%	+36.7%	Significant increase

3	Recognizing wounds and signs of infection	30%	80%	+50%	Improved very well
4	Initial action when a wound is found	33.3%	76.7%	+43.4%	Significant increase
Average Skill Increase		39.2%	83.4%	+44.2%	Very significant

The results of direct observation of the elderly's skills in treating wounds showed a very significant increase in performance after education and demonstration. In general, the average skills of the elderly with good performance increased from 39.2% in the pre-test to 83.4% in the post-test, with an increase of +44.2%. In the aspect of routine independent foot examination, only 40% of the elderly did it correctly before education, and increased to 86.7% after the intervention. This shows that education has succeeded in instilling preventive habits that are very important in preventing diabetic wounds. The technique of washing and drying feet correctly increased from 53.3% to 90%, indicating that participants were able to implement appropriate hygiene practices after receiving direct training. In the aspect of recognizing wounds and signs of infection, good performance increased from only 30% to 80%, indicating a significant increase in the ability to detect early symptoms of at-risk wounds. Initial action when a wound is found also increased from 33.3% to 76.7%, indicating that participants not only know the theory, but can also provide first aid independently. These results prove that a hands-on practice-based educational approach is very effective in developing elderly skills in diabetic wound care, which is an important strategy in reducing the risk of complications.

Table 3. Statistical Test Results (Example: Paired t-test/Wilcoxon)

Variables	p-value	Information
Knowledge score	0,000	There is a significant difference before and after education
Skill score	0,000	There was a significant improvement after education

The results of statistical tests using paired t-test or Wilcoxon signed-rank test showed that there was a statistically significant difference between before and after the intervention in both aspects of knowledge and skills. The significance value (p-value) for the knowledge score was $p = 0.000$, which means that the education program had a real impact in improving the elderly's understanding of diabetes and wound care. Likewise, for the skill score, a p value of 0.000 was obtained, indicating that the elderly's skills had increased significantly after receiving education and training. Thus, these results strengthen that the educational intervention designed in this study was statistically and clinically effective, and can be recommended for wider implementation as part of a strategy to improve the quality of life of elderly people with diabetes, especially in urban areas.

DISCUSSION



1. Improving Elderly Knowledge about Diabetes and Wound Care

The results showed a significant increase in the knowledge of the elderly about diabetes and wound care after the educational intervention. The average knowledge score increased from 57.9 ± 10.5 to 82.6 ± 8.4 , reflecting the effectiveness of education in improving the understanding of the elderly. This increase is in line with Bloom's theory which states that knowledge is the basis for changes in individual attitudes and behavior (Ulfah & Arifudin, 2023).

Research by Bunardi (2022) supports this finding, showing that health education can significantly improve the knowledge and attitudes of the elderly about diabetes mellitus ($p < 0.05$). Likewise, Suryani et al. (2024) found that health education accompanied by reminder messages increased the effectiveness of therapy in patients with diabetes mellitus (Bunardi, 2023; Suryani et al., 2024).

The researcher's assumption is that the use of educational media such as booklets and short videos makes it easier for the elderly to understand the material, especially for those with limited literacy. Education that is delivered repeatedly and interactively is believed to strengthen information retention and encourage positive behavioral changes.

2. Improving Elderly Skills in Wound Care

Direct observation showed a significant increase in the elderly's skills in caring for wounds after education. The average performance increased from 39.2% to 83.4%, indicating that the elderly not only understood the theory but were also able to apply it in practice. This is in accordance with the kinesthetic learning approach, where active involvement in practice improves understanding and retention of skills (Gardner, 2011).

Research by Sari et al. (2024) showed that diabetic foot care education significantly increased patient and caregiver knowledge, with the average value increasing from 67.03 to 82.70 (Sari et al., 2024).

The researcher's assumption is that direct demonstration and repeated practice in education strengthen the elderly's skills in wound care. Active involvement in the learning process is believed to increase the elderly's self-confidence and independence in self-care.

3. Statistical Significance of Increase in Knowledge and Skills

Statistical analysis using paired t-test showed that the increase in knowledge and skills of the elderly after education was significant ($p = 0.000$). This indicates that educational interventions have a real impact on increasing the capacity of the elderly in managing diabetes and wound care.

Research by Yarnita et al. (2024) found a significant relationship between knowledge and foot wound care in patients with diabetes mellitus, with a p-value of 0.033. In addition, research by Suryani et al. (2024) showed that health education and reminder messages influenced the effectiveness of therapy for patients with diabetes mellitus (Suryani et al., 2024; Yarnita et al., 2024).

The researcher's assumption is that structured and continuous education can significantly improve the knowledge and skills of the elderly. This increase is believed to contribute to the prevention of diabetes complications and improving the quality of life of the elderly.

CONCLUSIONS

This study shows that the health education program and diabetic wound care provided to the elderly in urban areas have a significant impact on improving their knowledge and skills. The knowledge scores of participants increased significantly, especially in the aspects of recognizing diabetes, how to care for wounds, and preventing foot wounds. In addition, the practical skills of the elderly also increased significantly, including the ability to perform self-examination of the feet, foot hygiene techniques, recognizing high-risk wounds, and initial treatment. The results of the statistical test supported these findings, with a significance value ($p = 0.000$), which confirmed the effectiveness of educational interventions based on media and direct demonstrations.

These findings are consistent with adult learning theory (andragogy), which emphasizes the importance of hands-on experience and practice in enhancing understanding and skills. In addition, these findings are consistent with previous research showing that structured education can improve the self-care capacity of elderly diabetics.

A. Suggestion

1. For Health Workers and Academics:

It is recommended to integrate similar educational programs into community service activities on an ongoing basis, with an interactive and hands-on practice-based approach, so that the elderly can continue to obtain applicable and easy-to-understand information.

2. For Families and Caregivers of the Elderly:

It is necessary to be actively involved in the education process in order to be able to support the practice of wound care at home, considering that most elderly people need help with daily care.

3. For Further Researchers:

Further research can be conducted using quasi-experimental designs or RCTs (randomized controlled trials) to strengthen the evidence of causality, as well as expanding population coverage to rural areas or elderly groups with limited mobility.

B. Policy Implications

1. Strengthening Health Promotion Programs in Primary Care:

The results of this study indicate the need for the government and health services to develop national standard education modules related to diabetic wound care, especially for the elderly population in urban areas.

2. Inclusion of Diabetes Education in the Elderly Posyandu Program:

Education related to prevention and treatment of diabetic wounds should be part of the routine activities of the Elderly Posyandu, with the support of trained health workers and appropriate educational media.

3. Development of Digital Media and Elderly-Friendly Applications:

Local governments and related agencies can support the development of educational applications or interactive digital booklets that can be accessed by the elderly and their families, in order to expand the reach of education and encourage the independence of the elderly in self-care.

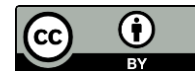
This conclusion confirms that educational interventions are not only effective individually, but also have great potential in developing public health strategies that are responsive to the



challenges of aging and chronic diseases, such as diabetes mellitus. With the right policies, this program can be used as a national model in efforts to prevent diabetes complications among the elderly.

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