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IMPLEMENTATION OF EDUCATIONAL INTERVENTIONS FOR PREVENTION DIABETIC FOOT COMPLICATIONS

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ABSTRACT
Diabetic Foot Care is primary prevention in diabetic foot management to prevent injury to the occurrence of wounds on the feet of people with diabetes mellitus. Objective: To prove that educational interventions can prevent chronic complications, namely diabetic neuropathy (motor, sensory and autonomic) or death of the nerves in the feet, often exacerbated by infection. Method: This study used the Quasi Experiment method with the One Group pretest and posttest design method . Data collection was carried out using NAFF (Nottingham assessment of Functional Footcare) and the Attitude instrument modified by the Knowledge, Attitude and Practice (KAP) questionnaire. Determination of the sample using the accidental sample method of 24 people in Type 2 Diabetes Mellitus patients. Results: This study showed an increase in value of 11.12 points on NAFF and an increase of 1.41 points on attitudes after educational interventions related to diabetic foot care were carried out from May 30, 2024 to June 7, 2024. Conclusion: Diabetic Foot Care Education Intervention has been proven effective in reducing complications in diabetic feet and can be used as an evidence-based intervention in preventive care of diabetic feet in patients with Diabetes Mellitus.

Keywords: diabetes mellitus; diabetic foot care; educational intervention

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INTRODUCTION

Complications due to high and uncontrolled blood glucose levels can affect the entire body system, resulting in decreased quality of life for sufferers, disability and even death (Lestari et al., 2021). The International Diabetes Federation (IDF) has estimated that 537 million adults are living with Diabetes Mellitus (DM) worldwide in 2021 with a projected increase to 783 million by 2045 if there are no effective prevention methods. Between 2021 and 2045, there will be a 46% increase in the number of adults with Diabetes mellitus in developing countries and a 20% increase in developed countries (Drovandi et al., 2023).

Diabetes is a chronic metabolic disease that causes complications such as cardiovascular, arteriosclerosis, hypertension, neuropathy, nephropathy and diabetic retinopathy. As the incidence and prevalence of diabetes increases, intervention through education becomes more important for controlling and preventing diabetes complications. In many cases, type 2 diabetes mellitus can be suppressed through intervention education (Devy, 2022). Treatment and prevention of complications of Diabetes Foot Disease (DFD) require diabetes patients to be integrally involved in independent health care. Patients receive education aimed at increasing knowledge, increasing adherence to treatment and participating in daily foot care activities (Drovandi et al., 2023). Evidence of the effectiveness of education alone without additional preventive measures in reducing the occurrence of DFD is insufficient, so it

requires follow-up of this health education. (Kaya & Karaca, 2018). Therefore, health education can effectively prevent the occurrence of diabetic foot disease, according to several articles that have been reviewed, tested in randomized controlled trials and meta-analyzed. The perspective of health education interventions with practical skills sessions and foot care equipment, reduces ulcer risk factors and improves diabetic foot disease prevention behavior (Lira et al., 2023).

Many studies have shown that educational interventions have a significant impact on preventing diabetic foot complications. Based on a journal search through the PubMed, Science Direct, Google Scholar and ProQuest databases, conducted by (Drovandi et al., 2023), this study shows that educational interventions have a very significant effect on improving the quality of life of patients with diabetes in order to prevent diabetic foot complications. Compliance and good attitudes in daily foot care can reduce the occurrence of diabetic ulcers which are often found in diabetic patients who do not perform foot care in their daily lives. The purpose of this study is to develop the application of educational interventions for the prevention of diabetic foot into a new program in a community-based approach as a health campaign event that can reach a wider and faster community. One alternative that can be given to patients with diabetes mellitus is to improve knowledge and behavior in preventing diabetic foot disease and improve the quality of nursing care.

METHOD

This study used the Quasi Experiment method with the One Group pretest and posttest design method. The implementation of the educational intervention was carried out for 4 weeks with 24 respondents who were all in the intervention group at the UPDT (Integrated Diabetes Service Unit) Polyclinic, Persahabatan Hospital, East Jakarta from May 30, 2024 to June 7, 2024. The determination of this sample used the accidental sample method based on the inclusion criteria of age over 18 years, type 2 diabetes mellitus patients, no allergies and no wounds or lesions on the skin. Data collection was conducted using a questionnaire. The NAFF (Nottingham assessment of Functional Footcare) questionnaire instrument, consisting of 27 statements with varying answer ranges, to measure the level of success of this application, where the interpretation of the results: High Risk = score <50, Low Risk = score> 50. The Attitude Instrument modifies the Knowledge, Attitude and Practice (KAP) questionnaire, this KAP instrument consists of 8 questions with yes and no answers, where the interpretation of the results: good attitudes score ≥5 and bad scores ≤5. In addition to supplies during home implementation, researchers provide foot care tools (containing: small towels, mirrors, lotions and nail clippers), as well as leaflets (RSP) provided by researchers. This measurement is carried out manually paper-based test with equipment provided by researchers. Furthermore, vivariate analysis is carried out on the NAFF score value and the Knowledge, Attitude and Practice (KAP) attitude score value using the t-test statistical test using the SPSS application.

RESULT

The search results obtained 145 articles which were then filtered and adjusted based on the assessment, resulting in 3 articles. The results were then analyzed to assess the quality of the article by assessing it using the AMSTAR 2 scale and it was concluded that the article was a High Quality Review, as the main source of evidence-based nursing practice.

Table 1.
Distribution of Respondents by Age (n=24)

Characteristics	Mean ± SD	Min – Max	95% CI
Age	61.21 ± 7.1	46 – 73	58.2 – 64.2

Based on table 1, the analysis results obtained the average age of respondents is 61.21 years with a standard deviation of 7.1 years. The youngest respondent is 46 years old and the oldest is 73 years old. The estimation results state that with a 95% Confidence Interval (CI), it is believed that the average age of respondents ranges from 58.2 to 64.2 years.

Table 2.
Characteristics of Respondents (n=24)

Characteristics		f	%
Gender	Man	10	41.7
	Woman	14	58.3
Educational level	No school	1	4.2
	SD	3	12.5
	Junior High School	4	16.7
	Senior High School	5	20.8
	D3	5	20.8
	Bachelor	6	25
Time to Diagnose	New	5	20.8
	Long	19	79.2

The table 2 shows that the gender of respondents is quite even with the distribution of male gender as many as 10 people (41.7%) and female gender as many as 14 people (58.3%). In the education category, the distribution of respondents who did not go to school totaling 1 person (4.2%), respondents who have elementary school education as many as 3 people (12.5%), respondents who have junior high school education as many as 4 people (16.7%), respondents who have high school education as many as 5 people (20.8%), respondents who have D3 education as many as 5 people (20.8%) and respondents who have a bachelor's degree as many as 6 people (25%). In the distribution of newly diagnosed as many as 5 people (20.8%) and respondents who have the old category in the old diagnosed variable as many as 19 people (79.2%).

Table 3
Normality Test

Numeric Variables	Implementation of Education	Shapiro Wilk		
		Statistics	Df	sig
NAFF	Pre	0.995	24	0.344
	Post	0.944	24	0.203
Attitude	Pre	0.715	24	0.237
	Post	0.708	24	0.237

In table 3, after conducting the data normality test, it was concluded that for the NAFF and attitude variables, p> 0.05 indicated a normal distribution. Furthermore, to determine the effect of implementing educational interventions in preventing diabetes, a T test was conducted.

Table 4
Differences in NAFF Values in Type II Diabetes Mellitus Patients (n=24)

Education Variable	Mean	N	STD Deviaton	Sig
NAFF Pre	49.13	24	5,690	0.0001
NAFF Post	60.25	24	3,802	

Table.5
Differences in Attitude Values (KAP) in Type II Diabetes Mellitus Patients (n=24)

Education Variable	Mean	N	STD Deviaton	Sig
Pre Attitude	3.67	24	0.963	0.005
Post Attitude	5.08	24	1,442	

The results of the analysis of the table 4 show that there is a significant difference (P,0.005) in the NAFF value before and after the implementation of educational interventions in

preventing diabetic feet. In table 5, the post-education variable shows that the average attitude value (KAP) in diabetes mellitus patients has a value of 3.67, while in post-education the average attitude value (KAP) has a value of 5.08.

DISCUSSION

Age Characteristics

The impact of aging is difficult to separate from other factors that are common in the elderly, such as chronic diseases, inflammation and low nutritional status, all of which can affect the endocrine system. Decreased hormone activity during the aging process is considered detrimental because it is associated with decreased body function (van den Beld et al., 2018). The average age group of 61.21 years in diabetes mellitus or late elderly age is at risk of diabetic ulcer complications, because at that age the body's physiological function decreases due to the degenerative process, there is a decrease in insulin secretion or resistance so that the body's ability to control high blood glucose is less than optimal (Manikkum et al., 2021). Elderly age is a period where age will experience changes that cause functional decline in the body. One of them is a decrease in the production and release of hormones regulated by enzymes that also decrease in the elderly, one of which is the insulin hormone (Detty et al., 2020). Complaints felt by the elderly often interfere with their physical activities are chronic degenerative complications in the blood vessels, due to pathophysiological changes due to the aging process (Sofyanti et al., 2022).

Gender Characteristics

Both sexes experience metabolic changes throughout their lives, and this is especially true for women who show more dramatic changes due to their role in reproduction (Detty et al., 2020). Gender differences are not only caused by genetic makeup, but also by socio-cultural habits, behaviors and lifestyles, as well as differences between women and men, exposure to certain environmental influences, differences in diet and lifestyle or stress or differences in attitudes in everyday life, and adherence to treatment (Amelia, 2018). Gender differences also affect behavior throughout life, and physical changes can have an impact on lifestyle, social roles and mental health (Frisca et al., 2020). Therefore, determinism and therapeutic outcomes in chronic diseases are influenced by a complex combination of biological and environmental factors, not to mention the many interactions of social and biological factors in women and men (Ciarambino et al., 2022).

Characteristics of Education Level

Based on the level of education of 24 respondents, it was found that 1 person did not attend school (4.2%), 3 respondents who had elementary school education (12.5%), 4 respondents who had junior high school education (16.7%), 5 respondents who had high school education (20.8%), 5 respondents who had D3 education (20.8%) and 6 respondents who had Bachelor's education (25%). The level of education can affect a person's knowledge in implementing healthy living behaviors, especially in preventing the occurrence of diabetic feet (Frisca et al., 2020). The higher the level of education, the higher the ability of a person to maintain a healthy lifestyle, attitude and behavior, especially in caring for diabetic feet to prevent complications from diabetes mellitus (Raju et al., 2022).

Characteristics of Length of Diagnosis

In the length of diagnosis category, the respondent data shows that the distribution of newly diagnosed patients is 5 people (20.8%) and respondents who have the long-diagnosed category are 19 people (79.2%). The length of diagnosis of diabetes mellitus is related to experience in managing the lifestyle of diabetes mellitus patients. Patients who have been

diagnosed with diabetes mellitus for a longer time will be more skilled in maintaining a healthy lifestyle, attitude and behavior in their daily lives compared to people who are new (Maina et al., 2023). The majority of respondents' average age is 61.21 so that self-acceptance of the diagnosis of diabetes mellitus is good, thus improving the quality of life of patients and preventing complications that occur in cases of diabetes mellitus (Agustina et al., 2022).

The use of both measuring instruments in this application showed results that were not much different, there was an increase in score values after being given educational intervention, which is the main journal in this application. This shows that educational interventions in diabetic foot care have a significant effect in preventing diabetes complications, especially those that often occur in the feet of patients with diabetes mellitus (Kalsum et al., 2020). According to the analysis, the short intensive education approach showed a statistically significant effect with a decrease in the risk of diabetic foot events, the results had a high heterogeneity of 91% which showed variation, where 45 minutes of education was given intensively, related to the use of footwear and proper foot hygiene (Hidayat et al., 2022). It was found that intervention education also had a positive and important influence to encourage health workers to periodically provide adequate foot care education for all patients. The program is considered to be able to maintain healthy behavior with assistance from health workers and can be carried out if the patient has sufficient knowledge, is able to manage obstacles in carrying out the behavior, and is committed to carrying out healthy behavior (Amelia, 2018). This activity is in line with the program carried out by the UPDT Persahabatan Hospital, although its implementation has not been maximized. Nurses placed in the UPDT already have Basic Diabetes Educator competencies, where in terms of human resources they are already able to carry out the program of providing intervention education related to diabetic foot care.

CONCLUSIONS

The results of the implementation showed a significant difference in pre and post implementation of the foot care education intervention. A total of 24 respondents experienced improvements in the assessment of NAFF scores and KAP attitudes after 30 days at home, the implementation of this educational intervention was effective in foot care at home. The results of the study showed that the intervention of diabetic foot care education is an independent nursing action, as a prevention of complications from diabetes mellitus, especially the feet. This application can be used as the authority of the nursing clinic as part of the authority of the hospital nursing clinic in providing patient care services. Developing and implementing based on Evidence Based Nursing Practice (EBNP) in the educational curriculum that can be applied in improving the quality of life of diabetes mellitus patients and improving knowledge and communicative skills and demonstrations, so that it can support the provision of quality nursing care in service institutions.

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