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THE EVIDANCE BASED NURSING PRACTICE: APPLICATION OF DIABETES SELF-MANAGEMENT EDUCATION TO LOWERING BLOOD SUGAR LEVELS IN THE ELDERLY

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ABSTRACT
Diabetes Mellitus is a collection of symptoms caused by high levels of glucose in the blood and is a chronic disease that can be experienced by the elderly due to a poor lifestyle and irregular eating patterns. Objective: This research aims to identify one Diabetes Self-Management Education article as a source of evidence that has quality so that it can be applied to reduce blood sugar levels in the elderly and determine its effect on elderly people with diabetes mellitus. Methode: The strategy used in this research is a quasi-experiment without control carried out with a one group pretest posttest design. The sample used in this study was 13 elderly people who had diabetes mellitus. Researchers use sample criteria to determine samples in research according to inclusion and exclusion criteria. Result: The results of the analysis using the Wilcoxon test showed that there was a difference in blood glucose levels in the elderly before and after implementing Diabetes Self-Management Education is p = 0.001, which means it has statistical significance. Conclusion: This research shows that implementing Diabetes Self-Management Education can reduce blood glucose levels in the elderly.

Keywords: blood glucose level; diabetes mellitus; diabetes self-management education; elderly

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INTRODUCTION

Diabetes Mellitus (DM) is a collection of symptoms of high blood glucose levels (Hyperglycemia) due to a lack of the hormone that regulates blood sugar levels (Insulin). The physiological changes in the elderly make them susceptible to suffering from disease, and DM is one of the chronic diseases that the elderly can experience (Alviani, 2022). The elderly are a late age group that has various changes both physically, mentally and socially due to the aging process and is a natural process faced by all humans and cannot be avoided (Ratnawati et al., 2015). Diabetes mellitus is also called a silent killer disease, because many sufferers are not aware of complications before they occur (Milita et al., 2021). The number of DM cases in the elderly from 2013 to 2018 experienced a significant increase in the 55-64 year age group by 2.5%, the 65-74 year age group experienced an increase of 2.2% and the over 75 year age group experienced an increase of 0.5% (Indonesian Ministry of Health, 2020). The increase in the prevalence of Diabetes Mellitus in Indonesia must be prevented. Preventive action for elderly people with Diabetes Mellitus is very important to reduce the burden faced by the elderly, their families and society (Ratnawati et al., 2018).

Efforts to provide information through education that can be made to change the behavior of DM sufferers in the elderly are with Diabetes Self-Management Education (DSME) which integrates the four pillars of DM management by directing sufferers to be able to carry out treatment independently. The research results show that self-management can help change sufferers' behavior to be more compliant in changing lifestyles (Dewi, 2020). DSME uses methods in the form of providing counseling, guidelines/modules and behavioral interventions to increase understanding related to DM and improve the skills of sufferers and families in dealing with DM (Funnell et al., 2009). The goal of DSME is to support decision making, self-care behavior, problem solving and active collaboration with the health team to improve clinical outcomes, health status and quality of life (Rahayu et al., 2017). Therefore, efforts to provide DSME can ultimately avoid acute and chronic complications, maximize blood glucose control and maximize quality of life. This research aims to identify one Diabetes Self-Management Education article as a source of evidence that has quality so that it can be applied to reduce blood sugar levels in the elderly and determine its effect on elderly people with diabetes mellitus.

METHOD

Researchers conducted an evidence search by identifying studies using the PICO formulation to help identify studies to find the same topic in each database. Researchers are looking for systematic review/meta-analysis articles that will be used as references in carrying out interventions. Researchers screened articles using the PRISMA flow diagram. Pubmed, Science Direct, ProQuest. The search began with coverage in several databases, namely Google Scholar, Pubmed, Science Direct and ProQuest. Findings were combined using boolean terms (AND, OR, NOT) in the subject headings. This database is relevant to the topic being reviewed and provides journal articles related to nursing and health. The search includes systematic reviews, meta analyzes or randomized control trials published in reputable journals.

The evidence articles sought were articles that met the inclusion criteria, namely in English, published in the last 5 years, namely 2017 to 2022, focused on health workers or nurses and discussed self-management education in diabetes mellitus. The exclusion criteria were articles discussing type 1 diabetes. Article screening started by identifying duplicate articles from the three databases used. Screening of articles is then continued by reading the title and abstract, selection of eligibility by reading the full-text of the article and critical appraisal of the selected articles. Critical appraisal was carried out by researchers using AMSTAR to assess the quality of systematic review articles. Overall the quality analysis results show high. Based on the results of the evidence search, the researcher finally chose one article to use, namely from Bekele et al., (2021) with the title Effect of diabetes self-management education (DSME) on glycated hemoglobin (HbA1c) level among patients with T2DM: Systematic review and meta-analysis of randomized controlled trials.

The strategy used in this research is pre-experimental research, namely quasi-experimental research without control. The research was carried out with a one group pretest posttest design where researchers carried out measurements on elderly people with diabetes mellitus who would receive the application of DSME on blood glucose levels. The population in the research that will be conducted is elderly people who live in Blimbing village, Central Java. Based on data obtained in February 2023, there were 41 elderly people suffering from diabetes living in the area. Researchers determined the number of samples using G*Power software with the results of calculating 13 samples taken for research. Researchers used a non-probability sampling technique with an accidental sampling method. Researchers use

sample criteria to determine samples in research according to inclusion and exclusion criteria. Inclusion criteria were people aged ≥ 60 years, diagnosed with T2DM as evidenced by the results of an examination of a blood glucose level of ≥ 140 mg/dl, who had or was currently using oral hypoglycemic drugs or insulin, had the ability to walk, and had no contraindications that could prevent participation. Then the exclusion criteria are people with type 1 diabetes, have cognitive disorders, have severe physical disorders, have psychiatric disorders and mental retardation and have taken a self-care course for diabetes before.

The EBNP application process has received ethical approval on May 5 2023 from the research ethics committee of the Brahmanda Lentera Chakra Institute with No.029/019/V/EV/KEP/LCBL/2023. Researchers obtained research permission from the area where the data was collected at the Puskesmas Gatak. The research was carried out in Blimbing Village. The health workers involved are village midwives who are responsible for the area. The intervention was carried out at the health cadre's house, because the location was in the middle of the village and easy to reach for respondents and the space was large enough for the implementation of EBNP. This research carried out intervention for 2 x 30 minutes every week 2 times and was carried out for 2 weeks. Data analysis was carried out univariately to determine the effect of Diabetes Self-Management on Education's blood glucose levels before and after implementation. The Wilcoxon statistical test was carried out because the data was not normally distributed.

RESULTS

The implementation of EBNP will be implemented in May 2023 with the amount. The research data will be displayed in the form of a descriptive table on the characteristics of respondents and a table of analysis results on the application of Diabetes Self-Management Education in reducing blood sugar levels in the elderly.

Table 1.
Respondent characteristics (n= 13)

Respondent Characteristics		f(%)
Age	≥ 60 – 65 years	8 (61.5)
	66 – 70 years old	3 (23.1)
	> 71 years old	2 (15.4)
Gender	Male	5 (38.5)
	Female	8 (61.5)
Consuming Diabetes Medication	Have ever consumed it	9 (69.2)
	Currently consuming	4 (30.8)
Work	Doesn't work	9 (69.2)
	Farmer	2 (15.4)
	Selling	2 (15.4)
Long Suffering from Diabetes	>1 years	13 (100)

Tabel 2.
Characteristics of Respondents' Blood Glucose Levels Before and After Implementing EBNP

Blood Glucose Levels	Before f (%)	After f (%)
Normal	5 (38.5)	9 (69.2)
Tinggi	8 (61.5)	4 (30.8)

This study, the age of most respondents was ≥ 60 – 65 years, 8 or 61.5%. The most common gender is female, 8 or 61.5%. The highest consumption of diabetes mellitus medication was 9 or 69.2%. The most common job for elderly people is not working, 9 or 69.2%. Most elderly people's highest level of education is no school, 7 or 53.8%. The number of elderly people suffering from diabetes has been suffering from diabetes for more than 1 year, 13 or 100%. Respondents' blood glucose levels before implementing EBNP. Most respondents' blood

glucose levels were high at 8 or 61.5%. Characteristics of respondents' blood glucose levels after implementing EBNP. Most respondents' blood glucose levels were high at 8 or 61.5%.

Tabel 3.
Analysis results

	Median (Min – Max)	Nilai *p*
Blood Glucose Levels Before Application	210 (147 - 290)	0.001
Blood Glucose Levels After Application	151 (133 - 257)	

This study shows data from the analysis of differences in blood glucose levels before and after implementing EBNP. Table 3 shows that the difference in blood glucose levels before and after implementing EBNP obtained a p value of 0.001, which indicates that the difference or influence between blood glucose levels before and after implementing EBNP is statistically significant.

DISCUSSION

A person who is more than 60 years old can be called an elderly person, and the elderly population is estimated to continue to increase (Milita et al., 2021). Diabetes mellitus is a growing problem throughout the world which generally occurs in people aged ≥ 60 – 65 years and is still a health problem that is still worrying in developed and even developing countries (Chentli et al., 2015). The experience of drug consumption in research results shows that most elderly people have consumed medication for diabetes mellitus. Taking medication is very important to maintain glucose levels within normal limits in the blood for elderly people suffering from diabetes mellitus (Nurafni et al., 2021). Antidiabetic drugs are regulated and used in the treatment of diabetes mellitus in the elderly (Yakaryılmaz & Öztürk, 2017). The work of the elderly in research results shows that most elderly people are no longer working. The incidence of diabetes mellitus in the elderly according to Milita et al., (2021) in their research on the incidence of type 2 diabetes mellitus in Indonesia, the majority have light to moderate jobs and the types of work include not working and being housewives. The aging process that occurs in the elderly can reduce the level of participation in work, whether they choose to retire or leave their job (Waskito, 2016).

Research results show that the longest period of suffering from diabetes mellitus is more than 1 year. Most elderly people have had diabetes mellitus for a long time and some are even quite serious (Anis et al., 2017). The duration of suffering from diabetes mellitus in the elderly can affect the level of compliance because they are bored with treatment (Nurafni et al., 2021). The length of time you suffer from diabetes mellitus will certainly influence the risk of complications from this disease (Mildawati et al., 2019). Supported by research which states that complications appear after 10 to 15 years in type 2 diabetes mellitus due to the accumulation of blood glucose which increases the longer the person suffers from diabetes mellitus, meaning that the longer a person suffers from diabetes mellitus, the greater the risk of complications (Permana, 2016).

Based on the results of the analysis, it shows that there is a difference or influence between blood glucose levels before and after the implementation of EBNP, namely the implementation of Diabetes Self-Management Education (DSME) in reducing blood sugar levels in the elderly, data obtained with a p value of 0.001 which is statistically significant. Based on the results of a study conducted on the implementation of DSME in respondents with type 2 diabetes mellitus, it was found that the fasting blood glucose levels of the respondents had decreased by around 29 mg/dl (Hananto et al., 2022). DSME is given on an ongoing basis which refers to the pillars of diabetes mellitus management. These pillars

include education, nutritional therapy, physical exercise, pharmacological therapy and monitoring blood glucose levels. Effectiveness on blood glucose levels in patients with type 2 diabetes mellitus, there were significant differences in blood glucose levels in measurements after being given DSME to respondents (Sudirman & Modjo, 2021). The effect of DSME management in diabetes mellitus patients can effectively improve glycemic control (Zheng et al., 2019). The application of DSME to elderly people with type 2 diabetes mellitus was reported to reduce blood glucose significantly, namely by 83.9% (Chrvala et al., 2016). The effectiveness of DSME in elderly patients with diabetes mellitus shows a significant increase in glycosylated hemoglobin (HbA1c) and diabetes self-management behavior (Azami et al., 2018). Providing DSME has been proven to have a positive impact on patients with diabetes mellitus. The presence of elderly people with diabetes mellitus greatly influences the success of diabetes care, because DSME has been proven to improve the quality of care (Murray & Shah, 2016).

CONCLUSION

The results of the EBNP implementation of Diabetes Self-Management Education in reducing blood sugar levels in the elderly concluded that the Randomize Control Trial article as a source of evidence entitled Effect of Diabetes Self-Management Education (DSME) On Glycated Hemoglobin (Hba1c) Level Among Patients with T2DM: Systematic Review and Meta-Analysis of Randomized Controlled Trials, obtained from the 2020 English-language journal Science Direct from the African country of Ethiopia. The main result identified was that the effectiveness of DSME in patients with type 2 diabetes had the effectiveness of reducing blood glucose levels among elderly people with diabetes.

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