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Social support as a key factor in the health promotion model: influencing diabetic wound prevention behavior

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ABSTRACT

Diabetic foot wounds are a serious problem that threatens the quality of life of diabetes patients. Individual factors, family, and social support have an important role in preventing diabetic foot wounds. This research aims to determine the aspects of social support in preventing diabetic foot wounds. The research employed a cross-sectional design, involving 120 respondents. The Modified Diabetic Foot Care Behavior (MD FCB) instrument was used to assess behavior related to diabetic foot care. Data analysis was conducted using logistic regression. The results indicated a positive correlation between high levels of social support and the prevention of diabetic foot wounds. In assessing patient knowledge about foot care, it was found that 20 people (16.7%) had poor knowledge. Additionally, low family support was seen in 23 people (19.2%), low peer support in 17 people (14.2%), and low support from health workers in 15 people (12.5%). Furthermore, 42 people (35%) exhibited poor behavior in preventing foot wounds. The Chi-square test revealed a significant influence of knowledge on behavior for preventing diabetic foot wounds (p-value 0.001). Meanwhile, the correlation between family support, peer support, and support from health workers in relation to diabetic foot wound prevention behavior was significant, with each showing a p-value of 0.01. Enhancing social support is identified as an effective strategy for reducing the risk of diabetic foot wounds and their associated complications. Therefore, efforts to increase social support levels for diabetes patients should be considered an integral part of their care regimen.

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1. INTRODUCTION

Diabetes mellitus (DM) poses a significant global public health challenge, with long-term elevated blood glucose levels contributing to serious medical complications [1]. The chronic condition results from a lack of insulin secretion by the pancreas or the body's inability to utilize produced glucose [2]. In 2012, DM caused 1.5 million deaths globally and contributed to an additional 2.2 million deaths due to heightened cardiovascular disease risk [3]. Projections suggest that by 2035, 592 million people worldwide will suffer from DM, with a concentration in low-income and intermediate countries [4]. Addressing this epidemic requires comprehensive strategies, including preventive measures, early detection, accessible treatment options, public awareness campaigns, and global collaboration among governments and healthcare stakeholders.

The International Diabetes Federation indicates that diabetes prevalence among the elderly globally is currently over 134.6 million, projected to rise to 252.8 million by 2035 and surpass this figure further [2]. The worldwide prevalence of diabetes in adults was 4.7% in 1980 (108 million people), escalating to 8.5% in 2014 (422 million people). Projections for 2040 estimate a staggering 642 million adults affected by diabetes. This increase is evident across age groups and disease types, with approximately 463 million people, constituting 9.3% of the global adult population aged 20 to 79, affected by diabetes in 2019 [5]. These statistics emphasize the urgent need for global efforts to address and manage the escalating prevalence of diabetes.

DM presents various complications, including foot wounds that demand meticulous attention and coordinated treatment by a healthcare team to minimize amputations [6]. Patient education is crucial in empowering individuals with diabetes by imparting knowledge, skills, and self-care abilities, fostering self-efficacy, and motivating lifestyle changes, thereby enhancing therapy compliance and awareness of complications [5]. Family support plays a pivotal role in diabetes management, as most care occurs within the household. This support aids in improving the well-being and self-management of diabetes sufferers by assisting in self-care activities and providing essential social and emotional support [7]. The involvement of both healthcare professionals and family members is integral in creating a comprehensive and effective support system for individuals living with diabetes.

Self-management is a critical aspect of diabetes treatment, but the growing diabetic population faces challenges in receiving adequate health education due to limited resources and time constraints of medical staff. Recognizing this gap, a peer support educational model for diabetes patients becomes crucial, utilizing the influence and experiences of peers to deliver effective programs [8]. Peer-administered education, often referred to as peer counseling or peer education, involves individuals with similar backgrounds and experiences sharing insights and learning from each other, providing a valuable complement to traditional healthcare [9]. The impact of online communities on peer support, demonstrating that these platforms offer emotional and technical support while empowering individuals. The altruistic spirit within society contributes to building self-confidence among diabetes patients, emphasizing the potential of peer-driven approaches in enhancing diabetes self-management.

Diabetes patients require routine self-care, particularly in foot care, which can reduce the risk of complications by 49% to 85%. A study in Malaysia highlighted poor knowledge and practices regarding foot care among diabetes patients, with significant risk factors including work activities, inappropriate footwear, and going barefoot at home [10]. Addressing this challenge calls for targeted support and interventions to raise awareness and promote effective foot care practices among individuals with diabetes. This study aimed to determine the correlation between social support with diabetic wound prevention behavior of diabetic mellitus patients.

2. METHOD

The design of this research is cross-sectional, a descriptive correlation study conducted in Semarang, Indonesia. In this study, 120 respondents as research samples were diabetes millitus (DM) patients at Semarang health centers. Determining the sample size in this study uses the Rule of Tumb formula with the maximum likely hood method. The minimum sample size is 100-150 respondents or 5-10 times the indicator (observed variable) is 5:1 indicator, meaning the parameter to be estimated [11]. The sampling technique used *consecutive* sampling. Inclusion criteria include Age between 40-55 years, duration of suffering from DM 1-5 years, level of compensatory awareness, living with family (nuclear family/*extended*), and DM patients with an International Working Group on the Diabetic Foot (IWGDF) risk score of 0-3. The exclusion criteria for this study were having diabetic foot wounds, visual and hearing problems, and complications micro vessels (CKD) and macrovascular complications (stroke). This research uses several instruments, including; The research instrument used to measure knowledge about foot *care* modified diabetic foot care knowledge (MDFCK). Instrument *social support* consists of an instruments family *support questionnaire* to measure family support. Instrument functions of diabetes peer support group scale (F-DPSG) to measure peer support and instrument support from health workers to measure support from health workers. Meanwhile, to measure behavior to prevent diabetic foot injuries using instruments. The knowledge instrument measures the level of understanding of foot care, social care support measure family support, peer support, and health worker support. The behavioral instrument for preventing diabetic foot wounds is in the form of modified diabetic foot care behavior (MDFCB) to measure good or bad behavior in preventing diabetic foot wounds. The research instrument used a questionnaire previously tested for validity and reliability with construct validity with alfa Cronbach 0.7 and was declared valid and reliable.

This research has received an ethical test with number 309/A.1-KEPK/FIK-SA/VIII/2022. Potential respondents who fit the research criteria have been explained about; the objectives, and benefits of the research, and then fill in *informed consent* as proof of availability following this study. Data is collected anonymously and is voluntary. Data was analyzed using the software SPSS 24. Before analyzing the data, researchers carry

out editing to see if there is missing data. The results of descriptive analysis are used to see the frequency and percentage of categorical data and for numerical data the mean, standard deviation, minimum and maximum values are used. Chi-square was used to assess the relationship between foot injury prevention behavior. Multiple logistic regression was used to see the variables that most influence the behavior of preventing diabetic foot wounds.

3. RESULTS AND DISCUSSION

Table 1 presents average age of the surveyed individuals was 59 years. Respondents reported suffering from DM for a duration of five years. This demographic information provides a snapshot of the characteristics of the study population, which can be valuable for understanding the context and potential implications of the findings related to foot care knowledge, support, and behavior.

Table 1. Characteristics of DM patients included age and length of DM

Variable	Mean±SD	Median	Min-max	95% CI
Age	59.23±7.66	59	39-86	57.84-60.61
Length of DM	5.06±1.81	5	2-10	4.73-5.39

Table 2 shows that respondents' knowledge levels regarding diabetic foot care and the impact of social support on preventive behavior for foot ulcers. It was found that 20 respondents (16.7%) had low knowledge about foot care, highlighting the need for improved education. Social support plays a significant role, with 57.5% of respondents receiving high family support, 85.8% receiving good support from peers, and 60% experiencing significant support from healthcare professionals. Despite low knowledge, 65% of respondents exhibited good preventive behavior, indicating that social support can enhance preventive actions. These findings emphasize the need for interventions that integrate both education and social support to reduce the risk of diabetic foot ulcers

Table 2. Distribution of knowledge, family support, peer group support, health care support and diabetic wound prevention behavior of DM

Variable	Frequency (%)
Knowledge of foot care	
low	20 (16.7%)
currently	52 (43.3%)
height	48 (40%)
Family support	
low	23 (19.2%)
currently	28 (23.3%)
height	69 (57.5%)
Peer support	
less	17 (14.2%)
Good	103 (85.8%)
Health care support	
low	15 (12.5%)
currently	33 (27.5%)
height	72 (60%)
diabetic wound prevention behavior	
Not good	42 (35%)
Good	78 (65%)

Table 3 conclude a significant portion of DM patients demonstrate moderate to high levels of foot care knowledge, supported by generally high family and peer group support as well as good healthcare support. However, there is room for improvement in enhancing family and healthcare support, particularly for those with low support levels. Targeted interventions are crucial to address the notable portion of patients exhibiting poor preventive behavior, emphasizing the need for comprehensive strategies to enhance overall foot care in this patient population. The variable that has the most influence on behavior to prevent diabetic foot injuries is family support (p value 0.0001). The influence of knowledge, family support, peer support, and health worker support on behavior to prevent diabetic foot injuries. There is a relationship between family support, peer support, and health worker support with diabetic foot wound prevention behavior. Predictors of diabetic foot wound prevention behavior: The logistic regression test was used to determine the variables that most influence the behavior of preventing diabetic foot wounds.

Table 3. Multivariate analysis of regression social support factors associated with diabetic wound prevention behavior

Variable	B	S.E	p-value	Odds ratio	95% CI for odds ratio	
					Lower	Upper
Knowledge	-.321	0.442	0.468	0.726	0.305	1.727
Family support	2.2.17	0.461	0.0001	9.177	3.721	22.635
Peer group support	3.113	0.526	0.002	22.495	3.026	167.219
Health care support	1.528	1.023	0.004	4.610	1.645	12.922

Diabetic foot ulcers (DFU) was a significant risk of lower extremity amputation and contribute substantially to mortality and morbidity among diabetes patients [12]. DFUs also lead to frequent hospitalizations, placing a substantial burden on both individuals and society [13]. Effective prevention and treatment of DFUs involve multidisciplinary management, addressing various risk factors such as blood glucose levels, blood pressure, lipid levels, and smoking cessation. Local DFU management, including debridement, bandaging, revascularization, stem cell decompression, and oxygen therapy, is crucial for successful outcomes [14]. Patients with diabetes play a vital role in foot care, as proper self-care reduces the risk of foot injuries, and family support is integral to fostering patient independence in managing this serious complication.

Family support is significantly associated with better self-management activities and is very important in managing and limiting the prevalence of diabetes [15]. Lack of family support for patient self-management behavior can hinder efforts to implement necessary behavioral changes. Absence, reduction, or loss of family support due to differences in gender and culture in different families can hurt the patient's health. Living together with people in the same house does not guarantee support in diabetes management. It is therefore very important to let patients narrate their life experiences in connection with the support of their family members [16].

Family support that is willing to provide attention will make DM patients feel cared for, appreciated and loved, make someone feel cared for, appreciated and loved [17]. Acceptance from a partner who suffers from DM is very much needed, such as in sexual matters which may be disturbed, this can give rise to anxiety, guilt, and feelings of failure as well as communication problems, and loss of sexual intimacy which can lead to a 'limbo state' with emotional emptiness and reduced quality of life [18]. A person with DM cannot be denied as a disease that can disrupt the sufferer's well-being. Not only do they have to tolerate the physical symptoms of the disease, its complications, and the side effects of treatment, but they also have to struggle to adapt their lives to accommodate self-care activities and adhere to recommended management [19].

Health education support from professional health services on the topic of management of diabetic feet needs to be emphasized, such as training from professional health workers for DM patients. In a survey of >400 health service providers in large tertiary care facilities, around 67% of doctors reported that DM patients had poor knowledge or no knowledge at all about diabetic foot ulcers [20]. The support provided by healthcare professionals, including information, monitoring, and advice, greatly influences the extent to which patients follow foot care guidelines [21]. Support from the health care system, such as easily accessible health services, availability of equipment, and assistance by medical personnel, can increase patient awareness and facilitate preventive actions. Then emotional and practical support from family and peers can motivate patients to carry out foot care more accurately and regularly [22].

Peer education has proven effective in improving self-care behavior among diabetes patients, suggesting its applicability in diabetes prevention and management efforts in Iran and surrounding regions [9]. Additionally, a pilot study on lupus patients, the peer approach to lupus self-management (PALS) intervention, showed positive trends with participants experiencing lower disease activity, higher quality of life, reduced pain symptoms, and increased social support after participating in the program (effect size>0.3). These findings highlight the potential of peer-based interventions to positively impact health outcomes and the well-being of individuals managing chronic conditions like diabetes and lupus. Additionally, both mentees and mentors scored very high for perceived credibility of treatment and service delivery support from either nurses or other people with the same illness are experts in the management of their illness and often have valuable self-management strategies to share with others [23]. Some patients with chronic illnesses may feel isolated if they do not have others in their social circle who understand the nature of their condition in more depth [24].

The results of research in China show that diabetes management focuses on medication management, nutrition, physical activity, patient involvement, and social support. However, it is difficult to directly measure whether educational aspects are effective in knowledge and self-care behavior [25]. Good knowledge with the support of family, peers, and health workers has a significant impact on foot wound prevention behavior in diabetes patients. These factors are the focus of education and intervention programs to ensure diabetes patients maintain good foot health [14]. Patients with good knowledge, family support, peer support, and health care provider support are more likely to adopt foot injury prevention behaviors, including wearing appropriate footwear, checking their feet regularly, maintaining cleanliness, and avoiding activities that could harm the feet [26].

Studies show that patients with good knowledge about foot care, along with support provided by family, peers, and health professionals, are more likely to adopt foot wound prevention behaviors [21]. Patients routinely check their feet for signs of damage or injury, maintain good foot hygiene, and avoid activities that could compromise the integrity of the foot skin [27]. The social support and knowledge provided by the people around the patient, along with the guidance and education provided by healthcare professionals, play a key role in encouraging patients to take the necessary preventive measures to protect their foot health [28]. Patients with good knowledge, family support, peer support, and health care provider support are more likely to adopt foot injury prevention behaviors, including wearing appropriate footwear, checking their feet regularly, maintaining cleanliness, and avoiding activities that could harm the feet [29].

The results of the study show that knowledge about foot care, support from family, and peers, and support from health workers play an important role in improving foot wound prevention behavior in diabetes patients. Good knowledge of foot care allows patients to take appropriate precautions, while emotional and practical support from family and peers helps motivate patients to take good care of their feet. Support from health workers, including education and regular monitoring, also makes a significant contribution to promoting diabetes foot wound prevention behavior. Overall, knowledge and support from various parties have a positive influence on foot wound prevention behavior in diabetes patients [30].

4. CONCLUSION

Social support plays an important role in increasing patient knowledge and awareness regarding the risk of diabetic foot wounds. Support from family, and friends, having sufficient knowledge about how diabetes can affect their foot health. This knowledge is important to prevent foot injuries and minimize the risk of complications. The social environment can increase monitoring of the condition of diabetes patients' feet. With social support, patients can incorporate changes, including minor injuries that may develop into serious problems if not addressed quickly. This support helps in early detection of diabetic foot wounds, and timely treatment. Apart from its effect on preventing diabetic foot wounds, social support also has a positive impact on the patient's quality of life. Emotional support from those closest to you can reduce the levels of stress and depression that are often associated with diabetes. A stable emotional condition can speed up the wound-healing process because patients are more likely to feel positive and motivated to take good care of themselves.

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