

# Community Health Worker Intervention Program on Self-Efficacy and Family Support in Foot Care on Diabetes Mellitus Patients

## Abstract

**Aims:** Diabetes foot is a complication of diabetes mellitus that can be avoided by practicing proper foot care. This behavior is influenced by factors such as self-efficacy and family support. The presence of communication and language barriers between health care providers and patients with diabetes mellitus leads to difficulties understanding diabetes education, which ultimately hinders self-care. As a result, an alternative approach using community health workers as a liaison is required. The purpose of this study is to understand how community health worker intervention programs affect self-efficacy and family support in diabetic foot care.

**Material & Methods:** The research design was a quasi experiment pre post with a control group on 72 diabetes mellitus patients taken by purposive sampling in the working area of the Lempake Primary Health Care Center in Samarinda City. Foot Care Confident Scale and Family Support Questionnaire were used to collect data. Various tests were used in the data analysis to assess self-efficacy and family support.

**Findings:** there were differences in family support in the intervention group versus the control group (p value 0.01). Meanwhile, there was no difference between the two groups in terms of self-efficacy (p value 0.48). There were, however, differences in self-efficacy and family support before and after intervention by community health workers (p value 0.05).

**Conclusion:** The community health care worker intervention can increase self efficacy and family support in foot care. As a result, there is a need for community health workers to be supported and guided in the prevention of noncommunicable disease complications, which can be used as part of the PTM Posbindu program activities at primary health care.

## Keywords

Diabetes mellitus, (<https://www.ncbi.nlm.nih.gov/mesh/68003920>)

Family support, (<https://www.ncbi.nlm.nih.gov/mesh/D000092802>)

Self-efficacy, (<https://www.ncbi.nlm.nih.gov/mesh/68020377>)

Community health workers, (<https://www.ncbi.nlm.nih.gov/mesh/68003150>)

Diabetic foot prevention, (<https://www.ncbi.nlm.nih.gov/mesh/68017719>)

## Introduction

Diabetes mellitus is currently a major global concern due to its increasing prevalence and the risk of causing disability and death. Indonesia has the sixth-highest number of diabetics in the world (1). Meanwhile, East Kalimantan Province has the highest number of diabetes mellitus patients (2). This disease can cause complications in a variety of organs, one of which is diabetic foot. The prevalence of diabetic foot wounds in Indonesia is 12%, which is higher than in China and the global prevalence (3). This disease not only contributes to diabetes mellitus patients' mortality and morbidity, but also to the burden on family caregivers (4,5).

Foot care that is not routinely found as one of the factors that cause diabetic foot in diabetes mellitus patients (6,7). Diabetes patients are often unaware that they are predisposed to diabetic foot complications. This was confirmed by Neta et al (8) who discovered that only 38.7% of respondents checked their feet 5-7 days per week. Psychosocial factors such as self-efficacy and family support influence this behavior. According to Huda's research (9), there is a link between self-efficacy and foot care behavior ( $p$  value 0.001  $r$  -0.542). According to this relationship, the higher the patient's self-efficacy, the lower the risk of destructive foot care behavior. Other studies, however, have found no significant relationship between self-efficacy and diabetes mellitus patients' foot care behavior (10,11). As a result, more research is required.

Salam et al (12) discovered that diabetic patients' foot care efficacy is still very low, particularly in terms of checking and protecting their feet. Bandura (1994) asserts that self-efficacy can be affected by a variety of factors, including environmental influences such as expectations and social support. In this instance, social support is familial support, which is a source of knowledge for enhancing self-efficacy (13). The incentive supplied by empathetic family members might help patients with diabetes mellitus develop self-assurance. Al-Kahfi et al (14) discovered a relationship between self-efficacy and family support and the prevention of diabetic foot ( $p = 0.00$ ).

There are still difficulties to the prevention of diabetic foot in underdeveloped countries, including the tendency of patients and health care providers to focus primarily glucose management (15) and a mismatch in communication and language between health care providers and patients. This led in patients having trouble comprehending diabetes instruction, which hindered their ability to engage in self-care (16). In order to avert problems, there is a need for an alternate approach that tries to overcome difficulties in health care for patients with diabetes mellitus.

The community health worker is one of the partners and liaisons between primary health care providers and the community. Community health workers are community people who are entrusted to serve as frontline public health workers able to positively impact the surrounding community. A systematic review by Olaniran et al (17) defines community health workers as laypeople with a profound awareness of the community's culture and language. The primary purpose of community health workers is to provide health services that are consistent with the culture of the community. Additional systematic review Hill et al (18) added the role of community health workers as instructors, supporting the delivery of care, coordination of care, and social support. Egbujie et al (19) found that community health workers have a crucial role as educators, support givers, and advocates, in addition to being potential agents of change.

Local laypeople are involved in illness prevention in developing nations as a result of current health care concerns and innovations. In addition, the paucity of resources in health services for providing fundamental interventions and prevention reinforces the need of community health workers (20). Alaofè et al (21) demonstrated that community health workers can increase knowledge, health habits, and health outcomes regarding the prevention and management of type 2 diabetes mellitus in low- and middle-income countries. However, the role of community health workers in the domain of noncommunicable diseases and associated problems in the society has not received sufficient attention at present. This study intends to evaluate the impact of a community health worker intervention program on the self-efficacy and family support of patients with diabetes regarding foot care.

## Materials & Methods

Quasy experiment design pre post test with control group were used in this study on 72 diabetes mellitus patients who were in the working area of the Lempake Primary Health Care Center, Samarinda City over a period of 6 months. The number of samples was obtained through the sample calculation formula with a mean off difference of 4.06, a standard deviation of 8.16, a significance level (CI) of 95% ( $\alpha=0.05$ ), and a power test of 80% ( $\beta=0.2$ ). Furthermore, respondents were taken

by purposive sampling and divided into 2 groups, namely 36 people in the intervention group and 36 in the control group.

The intervention program was designed to provide group education on diabetic foot and its prevention, including foot care and blood sugar management. Through talks and demonstrations, diabetic foot prevention modules are disseminated. Each group consists of patients with diabetes mellitus and their families, headed by three community health workers. A month later, the community health worker conducted a follow-up home visit.

24 community health workers from the operating region of the Lempake Health Center in Samarinda City joined this program. The community health workers had previously received instruction on the prevention of diabetic foot. Diabetes mellitus and diabetic foot, foot care, and training community health workers to become trainers and motivators are included in the offered materials. Local primary health care center personnel participated in the training activity. In addition, a pilot study of the community health worker intervention program was conducted as an early test of the apparatus and intervention.

The instrument used to measure self-efficacy is the Foot Care Confident Scale (FCCS) questionnaire which has 12 questions. The lowest score is 1 and the highest is 4, so the total score is in the range 12-48. The reliability of the FCCS questionnaire during development obtained a Cronbach  $\alpha$  value of 0.92 (22). While the questionnaire that has been translated into Indonesian obtained a Cronbach  $\alpha$  value of 0.76 (12). Furthermore, family support was measured using a questionnaire of 20 questions in the form of Likert questions. Each question item has the lowest score of 1 and the highest score of 4. Cronbach's  $\alpha$  value in this study was obtained 0.72.

#### Statistical Analysis

Data on respondent characteristics for age and length of illness were analyzed using the mean, median and standard deviation. As for other data presented in the form of a frequency distribution. The data normality test was carried out before conducting bivariate analysis using the Shapiro-Wilk test with a significance value of  $> 0.05$  indicating that the data is normally distributed. Family support and self-efficacy variables before and after each group were analyzed using the paired t test of difference. If the data were normally distributed, the alternative was Wilcoxon. Meanwhile, to compare the variables of family support and self-efficacy in the two groups using the t test if the data is normally distributed and the alternative is Mann Whitney with a significance value  $< 0.05$  (p value  $< 0.05$ ).

#### Ethical Considerations

This study has been granted ethical approval from the Health Research Ethics Committee of Health Polytechnic East Kalimantan with number: LB.01.01/7.1/002420/2021 on March 15, 2021.

### Findings

Respondents in this study were 72 diabetes mellitus patients who were divided into 36 people in each group. Table 1 shows an average age of 52 years in the intervention group and 55 years in the control group with a duration of illness of about 4 years. Most of the respondents in both groups were unemployed (55.6%) and had basic to advanced education.

**Table 1** Characteristics of respondents

Characteristics	Intervention Group		Control Group	
	Frequency	Percentage	Frequency	Percentage
Age	Mean (SD) 52.3 (11.4)		Mean (SD) 55.4 (88.8)	
Old sick	Mean (SD) 4.4 (4.9)		Mean (SD) 4.6 (4.5)	
Gender				
Man	11	30,6	14	38,9
Woman	25	69,4	22	61,1
Occupation				
Civil servant	2	5,6	1	2,8
Private employees	7	19,4	5	13,9
Self-employed	7	19,4	10	27,8
Not working	20	55,6	20	55,6
Education				
Basic education	15	41,7	19	52,8
Further Education	17	47,3	16	44,4

Higher education	4	11,1	1	2,8
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**Table 2** Analysis of Differences in Average Values of Self-Efficacy and Family Support in the Intervention and Control Groups

Variable	Intervention Group		Control Group		Test	
	Pre Test <i>Mean±SD</i>	Post Test <i>Mean±SD</i>	Pre Test <i>Mean±SD</i>	Post Test <i>Mean±SD</i>	Z	p
Self Efficacy	35.39±4.3	37.08±3.9	32.69±9.9	36.19±6.2	-0.703 <sup>c</sup>	0.48
Test	Z=-2,232 <sup>a</sup> p=0.02		Z=-1,092 <sup>a</sup> p=0.27			
Family Support	57.97±12.3	63.92±10.9	60.47±13.8	62.92±13.1	-2,458 <sup>c</sup>	0.01
Test	t=-4.327 <sup>b</sup> p=0.00		Z=-1.165 <sup>a</sup> p=0.24			

a : wilcoxon test, b : paired t test, c : mann whitney

Table 2 shows that there were differences in family support in the group that was given intervention by community health workers compared to the control group (p value 0.01). Meanwhile, for self-efficacy, there was no difference between the two groups (p value 0.48). However that there were differences in self-efficacy and family support before and after the group that was given intervention by community health workers (p value <0.05). Whereas in the control group there was no difference in self-efficacy and family support (p value > 0.05).

## Discussion

This study demonstrated that community health worker intervention programs had an effect on family support for individuals with diabetes mellitus who require foot care (p value 0.01). Important in assisting diabetes mellitus patients to take care of themselves in order to prevent complications, such diabetic foot is family support (23). The goal of the community health workers' intervention program is also to involve families in group education sessions. The purpose of this document is to provide information about diabetic foot and its prevention so that families can assist and support patients with foot care at home. The research of Sari et al (24) demonstrates that family education can increase foot care behavior (p = 0.00).

Despite the fact that the community health worker's intervention had no significant effect on the self-efficacy of diabetes mellitus patients (p = 0.24), there were differences in self-efficacy before and after receiving the intervention program from community health workers (p = 0.02) compared to the control group (p value 0.27). After receiving the program from community health workers, the intervention group had a greater gain in efficacy than the control group. Patients with diabetes mellitus can develop self-confidence as a result of external stimulation, in this example from caring community health workers and family members (14).

Classes facilitated by community health workers are meant to educate patients and their families about diabetic foot disease and its prevention. Foot care information is presented through lectures, debates, and demonstrations. Patients with diabetes and their families feel more comfortable speaking with community health workers since they are familiar with their environment. In addition, community health workers explained using terminology that was easily understood by the populace. This validates the findings of a comprehensive review by Olaniran et al (17), which indicates that community health workers are laypeople with an in-depth awareness of the community's culture and language.

The instructional media utilized in this class is a module. The module is visually appealing and contains images so that the respondent and his or her family may easily comprehend the information supplied. In addition, the module is simple to store and read multiple times, and it can aid in recalling the message's contents (25). In addition to providing educational programs, community health workers perform home visits. This intervention is intended as a follow-up to diabetes education sessions in order to monitor and evaluate the foot care behaviours of diabetes patients at home.

One of the limitations of the study was due to the implementation of study during the Covid-19 pandemic so that home visits could only be carried out once. In addition, group educational activities are carried out repeatedly by community health workers in each managed group. This is due to social restrictions that do not allow gathering of patients and families in the planned number.

The results demonstrated that the community health worker intervention program increased the family support and self-efficacy of patients with diabetes mellitus in foot care. Self-efficacy and family support have been identified as factors that influence attempts to prevent diabetic foot, with self-efficacy being the most important component (14). Therefore, the future plan for this community health worker intervention action can be devised by implementing an education program on self-efficacy. Self-efficacy education programs are essential for improving diabetic patients' foot care practices.

## Conclusion

Community health worker intervention programs can affect family support and self-efficacy of diabetes mellitus patients in foot care. There was a difference in the average value of family support and self-efficacy between before and after the activities were carried out in the intervention group (p value <0.05). The program design in the form of educational classes and home visits conducted by community health workers can be a factor in this increase. Therefore, there is a need for support and guidance for community health workers regarding the prevention of non-communicable disease complications and can be used as part of the PTM Posbindu program activities at the Primary Health Care Center.

**Acknowledgements:** The authors are grateful to Directorate General of Health Workers Ministry of Health Republic Indonesia, Director of Health Polytechnic Ministry of Health East Kalimantan, Head of Center for Research and Community Service, Head of Nursing Department, Head of Lempake Primary Health Care Center and community health workers who have provided good cooperation in this research.

**Conflict of Interest:** The authors declare no conflict of interest.

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