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Kharisma Pratama ✉; Jaka Pradika; Gusti Jhoni Putra; Syahid Amrullah; Tisa Gusmiah; Yenni Lukita; Surtikanti; Lince Amelia; Cau Kim Jiu

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Prevention for Risk Ulceration on Diabetic Foot Patients – Nursing Staff Competency

Kharisma Pratama[a)], Jaka Pradika, Gusti Jhoni Putra, Syahid Amrullah, Tisa Gusmiah, Yenni Lukita, Surtikanti, Lince Amelia, and Cau Kim Jiu

[Nursing] *Study Program, STIK Muhammadiyah Pontianak, Pontianak, Indonesia*

[a)]Corresponding author: kharisma@stikmuhptk.ac.id

Abstract. The study aimed to investigate nurses' competency for preventing risk ulceration on diabetic foot patients. Data collection was carried out from March to May 2019. The target population was 127 nurses who work at Primary Health Services in Kalimantan Barat. The study instruments consisted of Guideline for Diabetic Foot Ulcer (DFU) prevention and Nursing competency for DFU prevention Form. The content validity of Nursing Competency for DFU prevention was 1.0. Data analysis was performed using descriptive statistics. Nurses had shown the ability in implementing the guidelines for DFU prevention in DM patients. There were 53 nurses (41.7%) who had a good performance, 62 nurses (48.82%) who had satisfaction performance. Only, 12 nurses (9.45%) had poor performance. The nurses had low score were retrained until met the satisfaction level. It can be concluded that All nurses have the competency to use the guideline in the prevention of diabetic foot ulcer. Nurses who work with diabetes mellitus patients in community service should enhance the competency to assess diabetic risk and provide foot care intervention. Besides, the study has not evaluated the diabetes mellitus patients after implementation of the guidelines for DFU prevention. Therefore, further study should evaluate the result of the implementation of the guidelines for DFU prevention in DM patients.

Keywords: Diabetic foot ulcer, diabetic foot ulcer prevention, Risk Ulceration.

INTRODUCTION

Foot Ulcer or diabetic foot ulcer (DFU) is one of the serious diabetes mellitus complications (DM) [1]. The prevalence of DFU in Indonesia is approximately 15% and the incidents among DM patients are 29 times [2]. According to the medical data record at the provincial hospital of West Borneo in 2011, there were 186 patients DM living with DFU. DFU affects the quality of life, and it increases morbidity and mortality, also leads to a substantial economic burden for patients, their families, and society [3]. Foot problems account for up to 15% of healthcare resources in developed countries and 40% in developing countries [4]. Many studies showed 15-46 folds higher lower limb amputation risk (LLA) in DM patients than the general population [5]. Additionally, an amputation increases the risk of subsequent LLA and mortality of patients, the mortality within the first month after LLA is 8.5% of patient, and in five years period reaches 39-68% [5].

Certified nurses in diabetic foot care are involved in the early stages of care and intervention [6]. The role of the nurse in diabetic foot care includes diabetic foot examination, wound care [7], advice on appropriate foot care, and regular follow-up to DM clinic [8][9]. Significantly, assessment is an early step to detect the risk of DFU, and foot care intervention should be planned to reduce the risk of ulcers according to risk factors identification [10].

Empirically, in Pontianak-Kalimantan Barat, there five DM patients died caused by sepsis from DFU, and also there were several DM patients experienced recurrent DFU. It is relevant to the statement of the nurses that there were DM patients who came to the hospital with recurred DFU. Subsequently, from the interviews of three nurses who work at a unit of Provincial hospital Pontianak, West Borneo, Indonesia, it is estimated that approximately 10-15 DM patients were admitted in the unit every month. The data medical record in Kitamura Wound Care Clinic of Pontianak,

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West Borneo also showed that during January-May 2015, 359 DM people suffered from DFU. Nurses said that the DM patients suffering from DFU need a long treatment period for the wound healing process and it would expend the wound cost; the patients need to spend approximately 15-23 USD per visit. Additionally, routine care is a perceived lack of addressing the occurrence of DFU among DM patients.

There are some studies regarding DFU prevention, namely: a systematic review regarding prevention of foot ulcer in the at-risk DM patient [11], beneficial effects of foot care nursing for people with diabetes mellitus [12], the practical guideline on the management and prevention of the diabetic foot [13], The Guideline for Diabetic Foot Ulcer Prevention In Diabetes Mellitus Patients In Pontianak, West Borneo, Indonesia [1]. Prevention of risk ulceration is very important because it helps DM patients to improve their quality of life and protect them from other complications. The study aimed to investigate nursing staff competency in diabetic risk assessment, diabetic risk classification, and diabetic foot intervention in diabetes mellitus patients.

METHOD

Study design

This was a descriptive study to investigate nurses' competency for preventing risk ulceration on diabetic foot patients. The instruments' study consisted of The Guideline for Diabetic Foot Ulcer (DFU) prevention and nurse's competency form for evaluating the outcome. The Guideline for Diabetic Foot Ulcer (DFU) prevention as an instrument study was distributed to nurses. Nurses were trained on how to apply the guideline for DFU prevention and then nurses tried out the guideline in DM patients directly. The guideline for DFU prevention includes diabetic risk assessment, diabetic risk category, and diabetic foot intervention (Fig. 1). After training, nurses were evaluated by the nursing competency form in implementing the guideline. The nursing competency form consists of 20 statement which related to the step of DFU prevention. Nurses get a score of "1" if they do each of the statements, and get a score of "0" if they do not. The total range score 10-20. If the score is more than 75% (15 - 20), it will be regarded as good, if the score is 50-70% (10-14) it will be regarded as satisfactory, and if the score was less than 45% (<9) it will be regarded as poor for competency for foot care. The training was conducted in Primary Health Services in Kalimantan Barat..

Subjects

The target population in this study was 127 nurses. Data collection was carried out from March to May 2019 to work at Primary Health Services in Kalimantan Barat. The majority of the nursing staff was female 87 (68.5%), most of the nurses were from bachelor's degree 80 (63%), the median years of working experience with DM patients was 6 (SD=3). 102 nurses had the certificate of wound care.

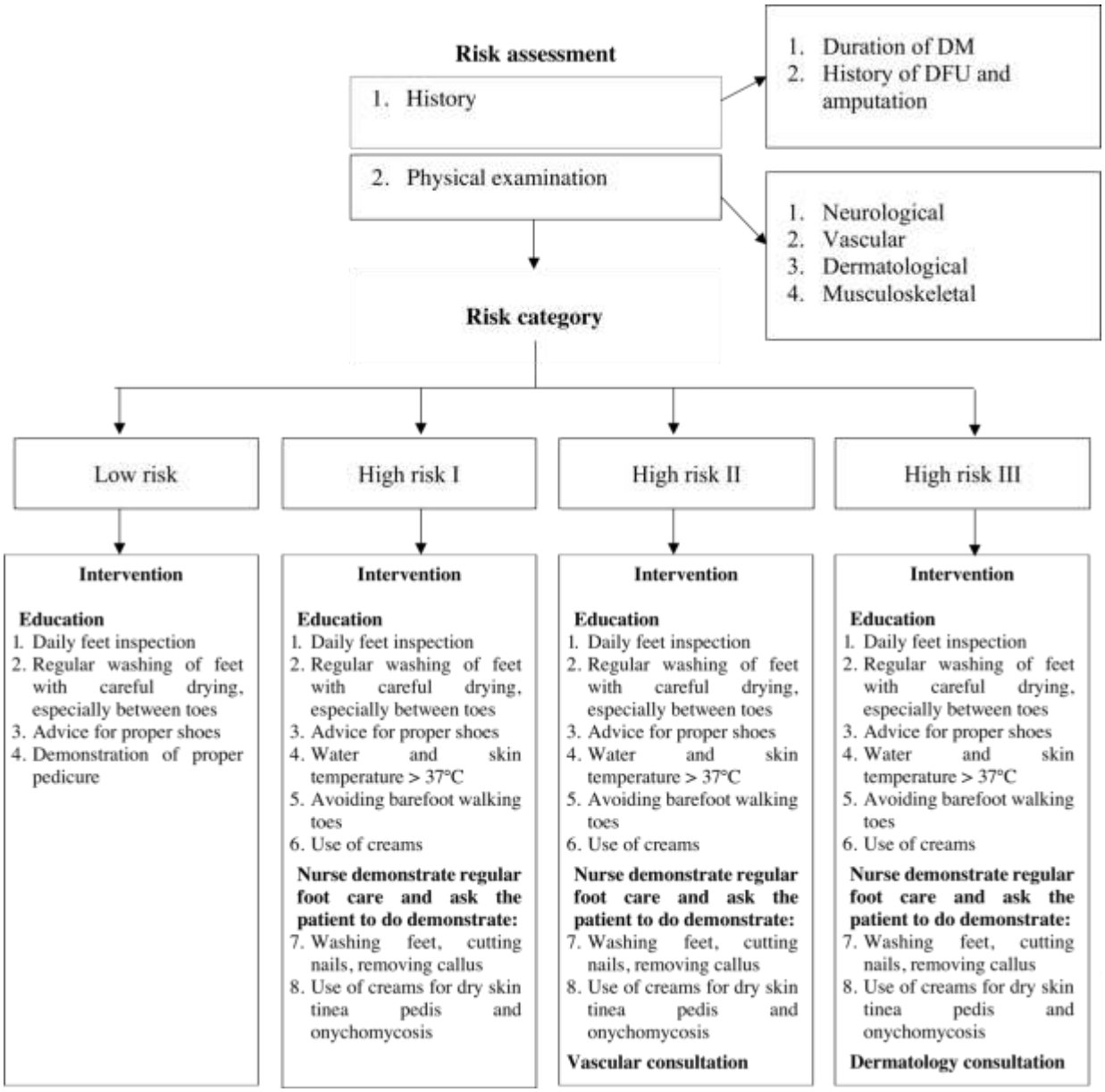

FIGURE 1. Diagram of DFU prevention

TABLE 1. Demographic data of the nurses implemented the guideline for DFU prevention (n=40)

	n (127)	Md Range SD
Male	40	
Female	87	
Diploma	47	
Bachelor	80	
Certificate of wound care		
Yes	102	
No	25	
Years of working experience with DM patients		6 (1-10) 3

Procedure and data collection

After explained the data collection procedure and asked to voluntarily join as participants, all participants asked to sign the consent. The head nurse was asked for a training schedule on how to apply the guideline for DFU prevention. all were trained nurses on how to apply the guideline for DFU prevention. The training took approximately 60-120 minutes. The training consisted of how to assess the diabetic foot risk, used the monofilament to detect neuropathy, detected PVD by using palpating at dorsalis pedis and posterior tibial of each foot patient, assessed skin and foot deformities, applied standard diabetic foot risk classification, and the last how to apply diabetic foot care base on the risk categories. Then, the nurses tried out the guideline with the DM patients. All nurses' performance was evaluated during the implementation used the nursing competency checklist.

2.4. Data analysis

Nurse' competency on guideline application and results of nurse application of the guideline were analyzed by using frequency, and percentage. The content validity of nursing competency DFU prevention had been identified by three experts. The S-CVI nursing competency DFU prevention was 1.0. Then, the internal consistency of nursing competency DFU prevention was assessed using KR 20 coefficient (0.80).

RESULTS

All of the nurses had the ability in implementing the guideline for DFU prevention in DM patients. Regarding performance level; there were 53 nurses (41.7%) had a good performance, 62 nurses (48.82%) had satisfaction performance. Unfortunately, there were 12 nurses (9.45%) who had poor performance. The nurses with poor performance were retrained until they met the satisfaction level.

TABLE 2. Nurse performance score in applying Guideline for DFU Prevention

Grade	Score		Total (n=40)	
	Point	**%**	**n**	**%**
Good	15-20	> 75	53	41.7
Satisfaction	10-40	50-70	63	48.82
Poor	< 9	< 45	12	9.45

DISCUSSIONS

It was shown in our study result that most of the nurses who implemented the guideline had a satisfaction level of performance. Only 12 nurses did not pass in the first training, which was the nurses who did not have a diabetic foot care certificate and had less experience in taking care of DM patients. The findings are in harmony with the nurse's opinion on the guideline which showed that all the nurses agreed and strongly agreed that the guideline was easy to understand [1]. Another possible explanation is that working experience in taking care of DM patients and training certificates in wound care are also factors that supported the nurse's ability. This study showed that the median years of working experience in taking care of DM patients was six (SD=3) year, ranged of 1 - 10 years, and there were 102 nurses had a certificate of diabetic foot care. It was found in one study that working experience assisted to enhance nurses' competency [14]. Nursing work experience, in consort with managerial guidance, had a substantial effect on improving nursing skills [15]. A higher proportion of nurses with ≥ 5 years of experience was associated with fewer errors and the low mean experience was associated with incidences/ errors [16]. A previous study also said that the knowledge and attitude of nurses also took effect toward nursing competency [17].

In addition, most of the nurses with poor competency were female and from diploma degree. in accordance with a previous study which showed that Male nurses were found to be more competent than their female counterparts [18]. It can be translated that quality care to prevent diabetes mellitus patients from ulceration foot to better being treated by male nurses, whereas for the quantity of care can be provided by female nurses. Furthermore, the level of education also has a big influence on the quality of care, especially in the prevention of foot ulceration among diabetes mellitus patients. It was found one study showed that nurses with diploma degree had poor competences than bachelor degree [14]

CONCLUSION

All nurses have the competency to use the guideline in the prevention of diabetic foot ulcer. Nurses who work with DM patients in community service can be improved the competency to assess diabetic risk and provide foot care intervention. In addition, the researcher has not evaluated the DM patients after implementation of the guidelines for DFU prevention. Therefore, further study should evaluate the result of the implementation of the guidelines for DFU prevention in DM patients.

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