

Original Article

Willingness, Knowledge, and Skills of Nurses in the Prevention and Management of Diabetic Foot Ulcers: A Cross-sectional Study in Indonesia



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ARTICLE INFO

Article History

Submit : April 2, 2025

Accepted : June 23, 2026

Published : July 1, 2026

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Citation:

Suryani, M. ., Marwaningsih, R. ., Winarni, I. N. S. B. ., Hadjiman, H., & Andriyani, E. T. . (2026). Willingness, Knowledge, and Skills of Nurses in the Prevention and Management of Diabetic Foot Ulcers: A Cross-sectional Study in Indonesia. *Journal of Applied Nursing and Health*, 8(2), 915–926. <https://doi.org/10.55018/janh.v8i2.282>

ABSTRACT

Background: Nurses play a crucial role in the prevention and management of diabetic foot ulcers (DFUs); therefore, they should possess adequate knowledge, skills, and a willingness to do so. However, limited evidence exists on Indonesian nurses' willingness, knowledge, and skills in the prevention and management of DFU. The study aimed to evaluate willingness, knowledge, and skills in the prevention and management of DFU among Indonesian nurses and to identify factors associated with these.

Methods: A cross-sectional survey study was conducted. A total of 549 nurses working in medical-surgical inpatient units at four hospitals in Central Java, Indonesia, were selected using convenience sampling, given ease of online access and willingness to participate. Data on willingness, knowledge, and skill in the prevention and management of DFU were collected using an online survey. The Chi-square and logistic regression tests were used for data analysis. This study was reported in accordance with the STROBE guidelines.

Results: The majority of nurses had no DFU training (65,2%), but had a bachelor's education level (51.9%) and were involved in DFU patient care (92.7%). Approximately 45.9% of nurses have adequate willingness, while 33.2% and 32.2% have adequate knowledge and skill, respectively. Higher education was associated with an adequate willingness (aOR 1.91, 95%CI:1.26-2.90, p=0.002), knowledge (aOR 1.55, 95%CI:1.07-2.26, p=0.020), and skills (aOR 1.72, 95%CI:1.18-2.51, p=0.005), among nurses. The DFU training was associated with adequate knowledge (aOR 2.71, 95%CI:1.86-3.95, p<0.001), and skills (aOR 2.63, 95%CI:1.81-3.85, p<0.001) of nurses. The DFU caring experience was also associated with nurses' knowledge (aOR 3.61, 95%CI:1.06-12.62, p=0.039) and skills (aOR 3.41, 95%CI:1.01-11.57, p=0.049). Furthermore, adequate knowledge (aOR 1.35, 95%CI:1.47-7.65, p=0.004) and adequate skills (aOR 5.60, 95%CI:2.41-13.01, p<0.001) were associated with willingness.

Conclusion: Under half of nurses in hospital settings had adequate willingness, knowledge, and skill in the prevention and management of DFU. Higher education level, practical training, and caring experience were associated with the nurses' willingness, knowledge, and skills. Adequate willingness was also associated with adequate knowledge and skill.

Keywords: Diabetes Mellitus; Diabetic Foot; Foot Ulcer; Nursing Care



Implications for Practice:

- Healthcare institutions should strengthen nurses' competence in the prevention and management of diabetic foot ulcers through structured clinical training, regular skills assessment, and adherence to evidence-based practice guidelines.
- Policymakers should prioritise continuing professional development programs and institutional policies that support nurses' engagement in diabetic foot care to improve the quality and consistency of patient outcomes.
- Nursing education curricula and workforce development initiatives should incorporate comprehensive diabetic foot care competencies to address resource constraints commonly encountered in Low- and Middle-Income Countries and other limited-resource healthcare settings.

Introduction

A diabetic foot ulcer (DFU) is one of the preventable complications of diabetes ([Van Netten, Woodburn, et al., 2020](#)). The global prevalence of DFU is 6.3% ([Zhang et al., 2017](#)) or 18.6 million people with diabetes worldwide experience DFU each year ([Armstrong et al., 2023](#)). Patients with diabetes who have neuropathy and/or peripheral arterial disease are at risk of developing DFU ([Van Netten, Bus, et al., 2020](#)). The prevalence of DFU risk in Indonesia is 55% and the prevalence of DFU is 12% ([Yusuf et al., 2016](#)), which is higher than the global prevalence. Approximately 50% to 60% of DFU become infected, and about 20% of moderate to severe infections lead to amputation ([Rodrigues et al., 2022](#)). The presence of DFU places a higher burden on patients and health care systems ([Edmonds et al., 2021](#)).

Considering the high prevalence of DFU in Indonesia and the burden it imposes, the prevention and management of DFU action by healthcare professionals requires serious attention. According to the theory of planned behavior, there is a relationship between knowledge, attitude, and practice,

where adequate knowledge and skills will increase the perception of behavioral control, which in turn influences the intention or willingness to act ([Ajzen, 2020](#); [Bosnjak et al., 2020](#)). Furthermore, intention or willingness is also influenced by beliefs about the effects of actions and others' expectations of the actions taken ([Ajzen, 2020](#); [Bosnjak et al., 2020](#)).

Nurses have a big role in the prevention and management of DFU ([Nayeri et al., 2020](#)). Nurses play a crucial role in preventive, curative, and rehabilitative efforts in the care of patients with DFU. The International Working Group of diabetic foot (IWGDF) and the Wound, Ostomy, and Continence (WOCN) have given the prevention and management of DFU guidelines for nurses in the word ([Bonham et al., 2022](#); [Bus et al., 2020](#)). The foot exercise, foot care, and wound care are recommended to prevent and manage the DFU ([Bus et al., 2024](#); [Schaper et al., 2024](#); [Suryani et al., 2021](#)). The support programs, by giving patients intensive health education regarding exercise, medication, diet, self-foot care, glucose control, and skill training and motivational interviewing education, have a positive effect on DFU recovery, glucose control, and self-management of patients in Indonesia ([Subrata et al., 2020](#)). However, DFU prevention and management are still a challenge for healthcare professionals in Indonesia ([Gitarja et al., 2018](#)).

Nurses are the healthcare professionals whose recommendations are listened to and followed by diabetic patients in Indonesia ([Ligita et al., 2019](#)). Thus, the awareness of willingness, knowledge, and skill in the prevention and management of DFU among nurses is very important. Nurses should have adequate willingness, knowledge, and skill to perform their roles in the prevention and management of DFU.

The current study found that 90% of healthcare professionals, including nurses

in the United States, have low confidence in caring for DFU because of a lack of knowledge (Walker et al., 2019). The other cross-sectional study in Turkey found that the majority of nurses had adequate knowledge of DFU management, but they did not use it when caring for patients, such as not educating patients and not performing foot examinations (Kaya & Karaca, 2018). There are also differences in the results of previous studies regarding the association between the knowledge, attitude, and skill of nurses in caring for DFU patients in Saudi Arabia, Sri Lanka, and Malaysia (Abdullah et al., 2017; Kumarasinghe et al., 2018; Sukri et al., 2020). There is limited evidence or literature on Indonesian nurses' willingness, knowledge, and skills in the prevention and management of DFU. Given the limited evidence or literature related to nurses' willingness, knowledge, and skills in DFU prevention and management in Indonesia, the results of this study are expected to complement this limitation with a targeted investigation to expand the existing nursing literature. The aim of the study was to evaluate willingness, knowledge, and skill in the prevention and management of DFU among Indonesian nurses and to determine factors associated with it (Figure 1).

Methods

Study Design

This study was reported in accordance with the STROBE guidelines and APA style citation guidelines. The study design was a cross-sectional survey to evaluate the willingness, knowledge, and skill in the prevention and management of DFU. We designed an association between the existing variables according to the theory of planned behavior. Knowledge and skills were parts of the belief in behavioral control, which is associated with the willingness to act.

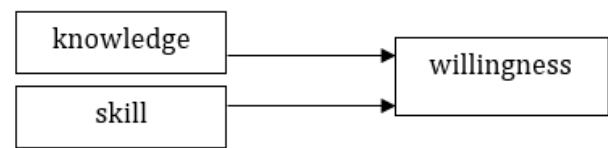


Figure 1. Conceptual Framework of the Relationship Between Knowledge, Skills, and Willingness in Diabetic Foot Ulcer Prevention and Management

Participants

We invited all nurses from four hospitals in Central Java, Indonesia that eligible to the study to participate in the study using an online invitation. Convenience sampling was used to select the sample, considering the ease of online access and willingness to participate. The eligible participants were nurses working in the adult medical-surgical inpatient unit. The inclusion criteria were nurses who actively worked in the adult medical-surgical inpatient unit in 4 hospitals in Indonesia, and provided informed consent. The exclusion criteria were nurses who were sick when the study was conducted and nurses who were unwilling to participate in the study for various reasons, such as being very busy. The minimum sample size was 384, that determined using the following formula: $n = z^2 / 4d^2$, assuming z-value of 1.96 that associated with the desired confidence level of 95 % and error (d) of 5% = 384. Considering a non-response rate of 40%, the total sample size was 549. Of the total 915 eligible nurses invited to participate in online surveys, 549 responded (response rate = 60.0%). A total of 549 nurses who agreed to become participants could continue to fill out the questionnaire, while 366 nurses who did not agree were not included in the study.

Instruments

Since there were no instruments to measure the willingness, knowledge, and skills in the prevention and management of DFU, the researcher developed the instrument in the Indonesian language. Thus, we did not do the translation or back-translation from the other language. The IWGDF and WOCN guidelines in DFU prevention and management (Bonham et al., 2022; Bus et al., 2020) were used as references in questionnaire development. We have developed a self-evaluation questionnaire on a numeric rating scale of 0-10, where 0 is really very unwilling and 10 is very willing for the willingness questionnaire, 0 is really do not know and 10 is really know, for each item of the knowledge questionnaire, 0 is really very unskilled and 10 is really skilled for the skills questionnaire. The willingness, knowledge, and skills each questionnaire consists of 23 items. The willingness, knowledge, and skill in prevention and management of DFU score were obtained, with a possibility score of 0-230 each from participants. We categorized a scale of $\geq 80\%$ of possibility maximum total score as an adequate category, while $< 80\%$ as an inadequate category. Data from participants were measured using valid and reliable instruments about nursing characteristics, nurses' willingness, knowledge, and skill in the prevention and management of DFU (Appendix A). The questionnaire content was validated before data collection by an expert team, including a nurse manager who manages patients with DFU and a nurse practitioner who specializes in DFU patient care. The instrument was modified by the comments of this expert team. A Cronbach's Alpha (α) of 0,98 and correlation coefficient (r) of 0.613 – 0.958 for the willingness questionnaire, $\alpha = 0.95$ and $r = 0.516 - 0.883$ for the knowledge questionnaire, and $\alpha = 0.95$ and $r = 0.481 - 0.824$ for the skill questionnaire were obtained after testing

the questionnaires on one of the first 30 subjects.

Data Collection

This study did not use enumerators in data collection. Participants were invited to participate in the study via mobile phone with the permission of their manager by the researchers. Participants were given 3 months to complete the survey by Google Form. We activated the built-in feature "limit to 1 response" in the settings menu on Google Form to prevent duplicate responses from participants. A Google Form link was circulated through the online platform WhatsApp Messenger (WhatsApp). We asked the workforce manager to remind the nurses to complete the survey. Researchers monitored and supervised participants' responses to the online survey, ensuring its completion and consistency. The time to complete the questionnaire was between 25 and 30 minutes. Data were collected between August 2022 and October 2022.

All collected data were evaluated for missing data during data entry. Missing data was planned to be removed during data entry. However, no missing data was found in this study.

Data Analysis

The Statistical Package for Social Sciences version 23 was used to analyze the data from the online database. Descriptive analysis was used to evaluate each variable. We used the Chi-square and logistic regression tests to evaluate the factors that were associated with adequate willingness, knowledge, and skill. The variable selection strategy used in this study was to include variables with a P value less than or equal to 0.2 in the Chi-square analysis and then enter them into the multivariate logistic regression model. A multicollinearity test using the variance inflation factor (VIF) and tolerance values was also performed to ensure there was no strong relationship or

multicollinearity between the predictor variables that had been selected for inclusion in the logistic regression test. We used variables that have a VIF value less than 5 and a tolerance value greater than 0.1, which indicated no multicollinearity. The Hosmer-Lemeshow test was used to assess the goodness-of-fit of the resulting logistic regression model. In this study, all of the Hosmer-Lemeshow test results ($P > 0.05$) indicated that the obtained regression model is feasible and able to predict the observed willingness, knowledge, and skills variables. Odds ratios (OR) with 95% confidence interval (CI) and P value were determined in the study. P-values of under 0.05 were considered statistically significant.

Ethical Considerations

The study procedure was reviewed and approved by the local hospital research ethics committees (No. 031/EA/KEPK-RSE/VIII/2022) and (No.192/KEPK-RSUDBMS/VIII/2022). The study complied with the Helsinki Declaration. Participants received an explanation of the study's purpose and procedure. All participants provided informed consent prior to participating in the study. The names of participants were coded, and only the principal investigator had access to the code. Data were stored and used solely for study purposes.

Results

Figure 1 illustrates the data collection flowchart. Of the total 915 eligible nurses invited to participate in online surveys, 549 responded (response rate = 60.0%). A total of 549 nurses who agreed to become participants could continue to fill out the questionnaire, while 366 nurses who did not agree were not included in the study, thus 549 questionnaires was analyze.

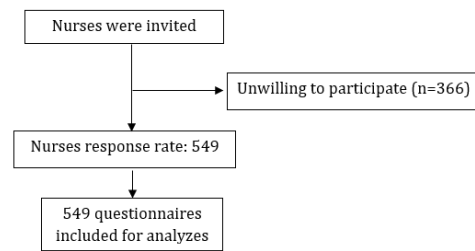


Figure 1. The data collection diagram

Table 1 illustrates that the majority of nurses were aged ≤ 40 , had worked as nurses for ≥ 10 years female, had a nursing bachelor's education level, had no training in the care of patients with DFU, and were involved in the care of DFU patients.

Table 1. Characteristics of participants (n=549)

| Characteristics | n(%) |
|--|------------|
| Age (year) | |
| ≤40 | 425(77.41) |
| >40 | 124(22.59) |
| Working experience (year) | |
| <10 | 257(46.81) |
| ≥10 | 292(53.19) |
| Gender | |
| Male | 97(17.70) |
| Female | 462(82.30) |
| Education | |
| Diploma | 264(48.10) |
| Bachelor | 285(51.90) |
| Formal training in caring for DFU patients | 191(34.8) |
| Involvement in DFU patients care | 509(92.7) |

Table 2 illustrates that approximately 45.9% nurses have adequate willingness, while 33.2% and 32.2% have adequate knowledge and skill, respectively.

Table 2. The nurse's willingness, knowledge, and skill, in DFU prevention and management

| Variables | Adequate n (%) | Not adequate n (%) |
|-------------|----------------|--------------------|
| Willingness | 252(45.9) | 297(54.1) |
| Knowledge | 183 (33.2) | 367(66.8) |
| Skills | 177(32.2) | 372(67.8) |

Table 3 displays the factors predicted to be associated with willingness, knowledge, and skills, which are free from multicollinearity. In the regression analysis, after adjusting for confounding variables, the education level (aOR 1.91, 95% CI: 1.26-2.90, $p=0.002$), adequate knowledge (aOR 1.35, 95% CI: 1.47-7.65, $p=0.004$), and skill (aOR 5.60, 95% CI: 2.41-13.01, $p<0.001$) were the only factors associated with adequate willingness. Nurses with a bachelor's education level were 1.91 times more likely to have adequate willingness than those with a diploma, and nurses who have adequate knowledge were 1.35 times more likely to have adequate willingness than those without, and nurses with adequate skill were 5.60 times more likely to have adequate willingness than those without.

In the regression analysis, after adjusting for confounding variables, the

education level (aOR 1.55, 95% CI: 1.07-2.26, $p=0.020$), DFU training (aOR 2.71, 95% CI: 1.86-3.95, $p<0.001$), and DFU care experience (aOR 3.61, 95% CI: 1.06-12.62, $p=0.039$) were the only factors associated with adequate knowledge. Nurses with a bachelor's education level were 1.55 times more likely to have adequate knowledge than those with a diploma, and nurses who have undergone DFU training were 2.71 times more likely to have adequate knowledge than those without, and nurses with DFU care experience were 3.61 times more likely to have adequate knowledge than those without.

In the regression analysis, after adjusting for confounding variables, the education level (aOR 1.72, 95% CI: 1.18-2.51, $p=0.005$), DFU training (aOR 2.63, 95% CI: 1.81-3.85, $p<0.001$), and DFU care experience (aOR 3.41, 95% CI: 1.01-11.57, $p=0.049$) were the only factors associated with adequate skill. Nurses with a bachelor's education level were 1.72 times more likely to have adequate knowledge than those with a diploma, and nurses who have undergone DFU training were 2.63 times more likely to have adequate skill than those without, and nurses with DFU care experience were 3.41 times more likely to have adequate skill than those without.

Table 3. Factors associated with adequate willingness, knowledge, and skill

| | Willingness | | | | Knowledge | | | | Skill | | | |
|-----------------------|------------------------|--------|----------------------|--------|----------------------|--------|----------------------|--------|----------------------|--------|----------------------|--------|
| | cOR(95%CI) | P | aOR(95%CI) | P | cOR(95%CI) | P | aOR(95%CI) | P | cOR(95%CI) | P | aOR(95%CI) | P |
| Education | | | | | | | | | | | | |
| Diploma | Reference | <0.001 | Reference | 0.002 | Reference | 0.009 | Reference | 0.020 | Reference | 0.002 | Reference | 0.005 |
| Bachelor | 2.11 (1.50-2.98) | | 1.91 (1.26-2.90) | | 1.62 (1.13-2.32) | | 1.55 (1.07-2.26) | | 1.78 (1.23-2.57) | | 1.72 (1.18-2.51) | |
| Training | | | | | | | | | | | | |
| No | Reference | 0.002 | Reference | 0.849 | Reference | <0.001 | Reference | <0.001 | Reference | <0.001 | Reference | <0.001 |
| Yes | 1.75 (1.23-2.49) | | 0.95 (0.60-1.50) | | 2.86 (1.97-4.15) | | 2.71 (1.86-3.95) | | 2.77 (1.91-4.03) | | 2.63 (1.81-3.85) | |
| Involvement in caring | | | | | | | | | | | | |
| No | Reference | 0.027 | Reference | 0.524 | Reference | <0.001 | Reference | 0.039 | Reference | 0.021 | Reference | 0.049 |
| Yes | 2.49 (1.09-5.68) | | 1.35 (0.53-3.39) | | 4.07 (1.21-13.61) | | 3.61 (1.06-12.62) | | 3.88 (1.16-13.01) | | 3.41 (1.01-11.57) | |
| Knowledge | | | | | | | | | | | | |
| Not adequate | Reference | <0.001 | Reference | 0.004 | | | | | | | | |
| Adequate | 14.28 (9.02-22.61) | | 1.35 (1.47-7.65) | | | | | | | | | |
| Skill | | | | | | | | | | | | |
| Not adequate | Reference | <0.001 | Reference | <0.001 | | | | | | | | |
| Adequate | 16.53 (10.23-26.75) | | 5.60 (2.41-13.01) | | | | | | | | | |

Discussion

We evaluated the willingness, knowledge, and skill, in the prevention and management of DFU among Indonesian nurses in the hospital setting and factors associated with it. Willingness, knowledge, and skill are very important for nurses, to show their professionalism or power. Our findings demonstrate that approximately 33% nurses have adequate knowledge. Different with the previous studies, that the majority or more than 50% of nurses in Sri Lanka, Pakistan, Turkey, and Ethiopia had adequate knowledge in managing and preventing of ([Abate et al., 2020](#); [Bilal et al., 2018](#); [Kaya & Karaca, 2018](#); [Kumarasinghe et al., 2018](#)). However, consistent with previous studies on nurses in Saudi Arabia, Malaysia, and Nigeria that showed majority of nurses had inadequate knowledge about prevention and management of DFU ([Alsaigh et al., 2022](#); [Buloala & John, 2018](#); [Sukri et al., 2020](#)). The difference in the proportion of nurses with adequate knowledge may be due to the different characteristics of nurses in different countries.

This study found that nurses with higher nursing education, training in DFU care, and experience in providing DFU care significantly associated with the adequacy of knowledge. Nurses with a bachelor's education level were 1.55 times more likely to have adequate knowledge than those with a diploma, and nurses who have undergone DFU training were 2.71 times more likely to have adequate knowledge than those without, and nurses with DFU care experience were 3.61 times more likely to have adequate knowledge than those without. Consistent with previous study that the knowledge among nurses in prevention and management of DFU was associated with the training they have received and experience in caring for patient ([Bilal et al., 2018](#); [Kumarasinghe et al., 2018](#)). Another previous study also

stated that the working duration as a nurse more than 10 years influence the nurses' knowledge ([Buloala & John, 2018](#)). However, in this study found that the working duration did not influence the knowledge of nurses.

This study also found that 32% of nurses in Indonesia had adequate skill in prevention and management of DFU patients. There are many skills that the nurses have to practice. The nurses must have the skills to educate patient about foot care, assessment of DFU risk, assessment DFU, and treat the DFU wound. Like the knowledge in prevention and management of DFU, the skill was also associated with nursing education level, training in DFU care, and experience in providing care of DFU patients. Nurses with a bachelor's education level were 1.72 times more likely to have adequate knowledge than those with a diploma, and nurses who have undergone DFU training were 2.63 times more likely to have adequate skill than those without, and nurses with DFU care experience were 3.41 times more likely to have adequate skill than those without.

The skill can be attained and developed by nurses during formal nursing education, working in the hospital, and DFU care training ([Aalaa et al., 2022](#); [Alotaibi et al., 2018](#)). Approximately two-thirds of nurses had not been trained in the care for risk and active DFU. Following to prior study, the majority of nurses in Turkey, Malaysia, Sri Lanka, and Pakistan did not receive training in DFU care training ([Bilal et al., 2018](#); [Kaya & Karaca, 2018](#); [Kumarasinghe et al., 2018](#); [Sukri et al., 2020](#)). Actually, the Indonesian association of wound care clinician continuously develops best evidence clinical practices and organizes certification ([Gitarja et al., 2018](#)). However, not all the nurses have the change to get certification in wound care.

The knowledge, skill, and willingness about prevention and management of DFU

on nurses are very important. Like knowledge and skill, the majority of nurses did not have adequate willingness was founded in this study. Only 45.9% nurses have adequate willingness. Consistent with previous studies in Ethiopia, Sri Lanka, and Turkey that majority of nurses did not have adequate willingness or attitude ([Abate et al., 2020](#); [Kaya & Karaca, 2018](#); [Kumarasinghe et al., 2018](#)). The previous studies found that not all the nurses were not willing to take preventive measures and management of DFU ([Bilal et al., 2018](#); [Kumarasinghe et al., 2018](#)). However, there were nurses that willing to do wound care, even though they felt that caring for foot ulcers was very long, willing to educate the patient to prevent ulcers, and willing to educate the patient to look after the ulcer ([Bilal et al., 2018](#); [Kumarasinghe et al., 2018](#)).

Nurses with a bachelor's education level were 1.91 times more likely to have adequate willingness than those with a diploma, and nurses who have adequate knowledge were 1.35 times more likely to have adequate willingness than those without, and nurses with adequate skill were 5.60 times more likely to have adequate willingness than those without. Like knowledge and skill, higher education level was associated with the nurses' willingness also in the prevention and management of DFU. It seems that continuing education level is very important to improve willingness, knowledge, and skill in prevention and management of DFU.

The more adequate knowledge and skill, the more adequate willingness of nurses in DFU prevention and management. Lack of knowledge and skill will affect the nurses' willingness to care for patients. Unwillingness of nurses to take action to prevent and manage DFU was significantly related to a lack of knowledge and skills. Consistent with the theory of planned

behavior, adequate knowledge and skills will increase the perception of behavioral control, which in turn influences the intention or willingness to act ([Ajzen, 2020](#); [Bosnjak et al., 2020](#)). In addition, intention or willingness is also influenced by beliefs about the effects of actions and others' expectations of the actions taken ([Ajzen, 2020](#); [Bosnjak et al., 2020](#)). Based on this theory, the adequate willingness of the nurse to take prevention and management of DFU for patients is associated with their belief about the effect of action and the patients' expectation of nurses' performance. However, we did not evaluate those beliefs.

Willingness shows how nurses behave when providing care to patients. Willingness refers to the readiness in a manner physical and psychological a nurse to perform their role in the prevention and management of DFU. This study was consistent with the previous study in Saudi Arabia that knowledge correlated with attitude ([Alsaigh et al., 2022](#)). Different from previous studies in Pakistan and Sri Lanka, which stated that nurses' knowledge and their attitude or willingness to care for the DFU patient did not correlate ([Bilal et al., 2018](#); [Kumarasinghe et al., 2018](#)). The study in Turkey found that even though the nurses have a high score level in knowledge regarding DFU management, this knowledge was not used during patient care ([Kaya & Karaca, 2018](#)).

Implications and limitations

Nurses' low willingness, knowledge, and skills in the prevention and management of DFU indicate a need for policymakers in the hospital to improve their nursing resources in Indonesia. DFU care training programs should be prioritized in the hospitals. Clinical guidelines for DFU care need reinforcement from all nurses as a reference for nurses in providing care for patients with DFU in

hospitals. Nurses need to be allowed to improve their knowledge, skills, and willingness qualities by continuing their education. In addition, when knowledge and skills are proven to be associated with the willingness of nurses to provide care to patients with DFU, this study contributed to the theory of planned behavior. The theory can be used as a reference in shaping nurses' behavior in patient care in hospitals. This study had a limitation. It was carried out in only four hospitals in one province (Central Java), thus, this limits its generalizability. Since we used the survey method in data collection, there is a possibility of self-report bias and online survey bias in the study.

Relevance to Practice

DFU training programs, combined with hospital support to reinforce DFU care guidelines for nurses, and policy changes that prioritize continuing education for nurses, can increase the adequacy of nurses' willingness, knowledge, and skills in the prevention and management of DFU, ultimately improving patient care.

Conclusion

The study has evaluated willingness, knowledge, and skill in the prevention and management of DFU among Indonesian nurses and determined factors associated with it. Nurses in the study demonstrated under half had adequate willingness, knowledge, and skill in the prevention and management of DFU. The higher education level, adequate knowledge and skill are associated with adequate willingness. The higher education level, training, and caring experience are associated with adequate knowledge and skill. These findings implicate that DFU care training programs should be prioritized in the hospitals, clinical guidelines for DFU care need reinforcement, and continuing education supports nurses' willingness, knowledge,

and skills in the prevention and management of DFU. DFU training programs, combined with hospital support to reinforce DFU care guidelines for nurses, and policy changes that prioritize continuing education for nurses, can increase the adequacy of nurses' willingness, knowledge, and skills in the prevention and management of DFU, ultimately improving patient care

Funding

This research received no external funding.

CrediT Authorship Contributions Statement

Maria Suryani: Conceptualization, Methodology, formal analysis, Supervision, Writing - Original Draft, Review & Editing

Ririn Marwaningsih: Investigation, Writing - Original Draft, Writing - Review & Editing

Ida Nur S. B W: Investigation, Resources, Data Curation

Hadjiman: Investigation, Resources, Data Curation

Erni Triyono A: Investigation, Resources, Data Curation

Conflicts of Interest

There is no conflict of interest.

Acknowledgments

We gratefully acknowledge all nurses who participated in the study.

Supplementary Materials

Supplementary File S1: Research Instrument contains the full questionnaire used for data collection.

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