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## ORIGINAL RESEARCH

### Factors affecting spiritual needs in patients with diabetic foot ulcers

Adelina Vidya Ardiyati

#### Author information

Department of Medical Surgical Nursing, Universitas Islam Negeri Syarif Hidayatullah Jakarta, Indonesia

adelinavidya@uinjkt.ac.id

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#### Abstract

Diabetic foot ulcers are one of the chronic complications of diabetes, leading to disease complexity. As a result, DFU may provoke problems in fulfilling spiritual needs that affect the healing process. This study aimed to analyze the factors related to the spiritual needs of diabetic ulcer patients in Indonesia. This cross-sectional study was conducted on 104 patients. The patients were recruited from 5 cities in Indonesia using a purposive sampling method from June 2022 until August 2022. The instruments consisted of a sociodemographic characteristics form and the Spiritual Needs Questionnaire (SpNQ) to explore patients' spiritual needs. Then, bivariate and multivariate binary logistics were performed. There is a significant relationship between spiritual needs and age, marital status, length of the wound, and degree of diabetic ulcer ( $p < 0.05$ ). It is recommended that healthcare workers need to pay attention to the factors that influence the spiritual needs of diabetic foot ulcer patients.

**Keywords:** Diabetic foot ulcer; spiritual needs; community nursing; chronic illness; diabetes care

#### Introduction

Diabetes Mellitus (DM) is a chronic disease characterized by increased blood glucose levels or hyperglycemia due to problems in insulin metabolism. DM is one of the world's ten leading causes of death (Monteiro-Soares et al., 2020). The prevalence of diabetes reaches 463 million, with a global prevalence of 9.3% (WHO, 2020). In addition, Indonesia positioned in fourth ranks with the most significant number of DM patients after India, China, and the United States, with a prevalence of 8.6% of the total population (WHO, 2014). Furthermore, there was an increase in new DM by 25%, and by 2020 it is estimated that there will be 10.8 million Indonesians with diabetes (RISKESDAS, 2018). Patients with DM having uncontrolled blood glucose levels cause complications such as coronary arteries, cerebrovascular disease, peripheral vascular disease, retinopathy, nephropathy, and neuropathy (Smeltzer and Bare, 2001). The proportion of chronic complications of diabetes in Indonesia in 2017 consisted of neuropathy (60%), coronary heart disease (20.5%), diabetic ulcers (15%), retinopathy (10%), and nephropathy (7.1%) (Hastuti, 2018).

Diabetic foot ulcers (DFU) are one of the chronic complications of diabetes in the form of damage to the skin and surrounding tissue that begins with vascular complications coupled with peripheral neuropathy and infection (Monteiro-Soares et al., 2020). DFU are associated with increased morbidity and mortality and a high risk of amputation, accounting for 14% to 24% of the risk of lower limb amputation (Polikandrioti et al., 2020). Despite many advances in treatment and diagnostic techniques, patients with DFU still report a poor quality of life. The determinants of quality of life are the loss of mobility that limits the patient's ability to perform daily tasks and the emotional and physical burden experienced (Polikandrioti et al., 2020). Craven & Hirnle (2017) stated that the factors that influence spirituality are age, family, life experiences, crises and changes, strengthened. In line with the finding, a study stated that the factors influencing the spiritual needs of patient with DFU are demographic variables and a person's condition (Khunkaew et al., 2019).

The problem of fulfilling spiritual needs can lead to a lack of patient interest in seeking information about diabetic ulcer healing, a lack of adherence to wound care, and a lack of blood sugar control so that the patient's condition becomes severe (Subhannur et al., 2020). On the other hand, spiritual needs make psychological disorders calmer and more confident, with a sense of closeness to oneself, others, nature, and God. Rahman Subhannur et al. 2020 conducted a literature review on spiritual needs in patients with diabetic ulcers and got the results that spiritual

fulfilment is the best coping because, subconsciously, it will create positive thinking, emotional, and motivational patterns that it can make healing process wounds more effective (Subhannur et al., 2020).

According to Husna (2015), in research at the Banda Aceh Hospital, the Spiritual Needs Questionnaire was used to assess respondents' spiritual needs. It divided them into three levels: low, medium, and high. The results of her research mas spiritual needs in diabetic ulcers can improve the patient's quality of life and increase the patient's self-esteem (Husna, 2015). Also, Zahara et al. (2019) say that the fulfilment of spiritual needs in hospital patients has a positive impact. Namely, increasing a sense of acceptance in patients, maintaining patient resistance to illness, providing a calm, increasing self-confidence, providing a positive self-image, reducing the patient's level of depression, and increasing hope for recovery from illness (Zahara et al., 2019). Based on the background described above and the results of the literature review that has been carried out, no research in Indonesia discusses the factors most related to the spiritual needs of patients with DFU. The study aims at investigating the spiritual need among patients with DFU in Indonesia.

## Method

This study used a correlative analysis and a cross-sectional approach. The population in this study were patients with DFU treated at Wound Care Clinics in 5 cities in Indonesia (Jakarta, Bogor, Depok, Tangerang, and Bekasi). Patients were recruited by using the purposive sampling technique. The number of samples obtained is 104 respondents, with inclusion criteria being patients with DFU who perform wound care at the study site and the exclusion criteria being diabetic foot ulcers without comorbidities. The study was conducted from June to August 2022. Data was collected through the demographic questionnaire of age, gender, marital status, duration of injury, and degree of wound based on Wagner's classification.

The spiritual need variable was assessed using the Spiritual Needs Questionnaire (SpNQ) instrument compiled by Prof. Dr. med. Arndt Bussing (2010). The researcher has done the correspondence and has sent the original version of the questionnaire in Indonesian by Prof. Dr. med. Arndt Bussing. The SpNQ questionnaire has been standardized and widely used in research conducted in Indonesia. Previously, this SpNQ questionnaire had been tested for validity and reliability with the results that all questions were declared valid and reliable with an r value between 0.74 – 0.92. This questionnaire consists of 4 categories, namely religiosity, inner peace, existential needs, and actively giving, and there are 29 questions. Questions in the religiosity category are found in questions number 3, 17, 18, 19, 20, 21, and 22; inner peace in numbers 1, 2, 6, 7, 8, 12, and 23; existential needs in questions 4, 5, 9, 10, 11, 15, 16, and active giving are contained in questions number 13, 14, 24, 25, 26, 27, 28, 29. The answers to the spiritual needs questionnaire are Yes and No. If the respondent answers Yes, then proceed with assessing how strong/important the spiritual needs are for them using a Likert scale, namely not important (score 0), quite important (score 1), important (score 2), and very important (score 3). We can know the level of spiritual need by adding up each question item with a rating of 0-29 which is said to be unimportant, 30-58 is said to be quite important, and 59-87 is said to be very important. Univariate analysis was carried out on age, gender, marital status, length of injury, degree of injury, and level of spiritual need analysis. Bivariate analysis was carried out with the Spearman correlation and logistic regression tests to analyze the factors most related to the patient's spiritual needs by looking at the Exp (B) value with a significant degree of 95%.

This study was approved by the Faculty of Health Sciences ethics committee at State Islamic University Syarif Hidayatullah Jakarta (Ethic Number Un.01/F.10/KP.01.1/KE.SP/08.08.001/2022).

## Results

The data indicated that comparing male and female respondents differs in value. Male respondents are 36 (34.6%), while female respondents are 68 (65.4%). Most of the respondent's ages were in the range of 40 to 60 years (76.9%), and the remaining 24 respondents were more than 60 years old. The description of the marital status shows that the respondents are married as much as 80.8%. Respondents who have had wounds for 1-3 months are 44 respondents (42.3%), and respondents with injuries less than one month and more than six months are the same as 24 respondents (23.1%). Most respondents had degrees of diabetic ulcers 1 and 2, namely 52 respondents (50%) who had grade 1 wounds and 40 respondents (38.5%) who had grade 2 wounds (**Table 1**).

**Table 1.** Demographic characteristics

Variable	Frequency	Percentage
Gender		
Male	36	34.6%
Female	68	65.4%
Age (Year)		
41-60	80	76,9%
> 60	24	23.1%
Marital status		
Marry	84	80.8 %
Widow/ widower	20	19.2 %
Duration of wound (month)		
< 1	24	23.1 %
1 - 3	44	42.3 %
4 - 6	12	11.5 %
> 6	24	23.1 %
Stage of wound		
Stage 1	52	50 %
Stage 2	40	38.5 %
Stage 3	8	7.7 %
Stage 4	4	3.8 %

The spiritual needs of patients with DFU were divided into three categories: high, medium, and low. Based on the results of the univariate analysis of the spiritual needs variable, there were only two categories, namely 68 respondents (65.4%) who felt that spiritual needs were critical and 36 respondents (34.6%) who thought that spiritual needs were quite substantial (**Table 2**).

**Table 2.** The level of spiritual need

Spiritual needs	Frequency	Percentage
High	68	65.4 %
Medium	36	34.6 %

The results indicated that there is a significant relationship between the dependent variable (spiritual needs) and the independent variable (age, marital status, duration of injury, and the degree of diabetic ulcers ( $p < 0.05$ ). The correlation coefficient results between the spiritual needs variable, the age variable, and the length of wound variable are in the correlation coefficient range between 0.30-0.49 and positive value. That  $p$  value means the relationship between the two variables is moderate and unidirectional (**Table 3**).

**Table 3.** Correlation analysis of spiritual needs

		Age	Marital status	Duration	Wound stage
Spiritual needs	Coefficient correlation (r)	0.369	0.260	0.398	0.285
	Sig (2-tailed)	0.000	0.008	0.000	0.003

The table shows that the factor most related to spiritual needs is duration of having DFU. Furthermore, based on the logistic regression analysis, the finding showed that spiritual needs had a significant relationship with age, duration of injury, and degree of injury with  $p < 0.05$ . The Nagelkerke coefficient is 0.531, which means that the independent variables of age, marital status, length of injury, and degree of injury affect the level of spiritual need in general by 53.1%. In comparison, 46.9% is influenced by other factors not included in the research variables (**Table 4**).

**Table 4.** Regression analysis

Variables	B	SE	Wald	df	p	Exp (B)	95% CI	
							Lower	Upper
Age	2.015	0.619	10.585	1	0.001	1.133	0.040	0.449
Marital status	0.362	0.614	0.347	1	0.556	0.697	0.209	2.322
Duration of wound	1.451	0.512	8.045	1	0.005	2.234	0.086	0.639
Wound stage	2.307	0.747	9.528	1	0.002	1.100	0.023	0.431
Constant	5.907	1.295	20.812	1	0.000	367.539		

## Discussion

The comparison of male and female respondents has a significant difference in value. Most of the respondents are female, as much as 65.4%. This study is in line with research conducted by Yazdanpanah et al. (2018) regarding the incidence and risk factors for diabetic ulcers, which states that women are more at risk of developing diabetes complications in the form of wounds compared to men with  $P = 0.002$  (Yazdanpanah et al., 2018). Furthermore, research conducted by Hidayah (2016) states that most diabetic ulcer patients are female, as much as 56% (Hidayah et al., 2016). This explanation about this condition is through a theory that states that hormonal changes will occur. Namely, a decrease in estrogen and progesterone hormones in older women, especially those with menopause, can increase the risk of type 2 Diabetes Mellitus, and blood sugar levels become uncontrolled because these hormones affect the body's cell response to insulin. If not controlled properly, this condition can lead to various acute and chronic complications, including neuropathy and peripheral angiopathy, leading to diabetic ulcers (Edmonds et al., 2021). Research conducted by Salehi (2020) obtained different results, namely that the majority of diabetic ulcer patients in his study were male. The predominance of male patients can be explained by the fact that more activities are carried out by men outside the home than women, so they are more exposed to the risk of injury and pressure on the soles of their feet (Salehi et al., 2020).

Most of the respondents in this study were 40 to 60 years, with as many as 76.9% of respondents. In line with research conducted by Hidayah (2016) that most diabetic ulcer patients are aged 40 to 60 years (72%), married (98%), and have a wound duration of fewer than three months (58%) (Hidayah et al., 2016). The result of this research is not in line with the study conducted by Yazdanpanah et al. (2018), which stated that there was no significant difference in the age variable in diabetic ulcer patients (Yazdanpanah et al., 2018). The explanation of this condition is a theory that says that the increasing age of a person, especially over the age of 40, will experience a decrease in body functions. For example, one can lead to a reduction in the amount of insulin hormone secretion from pancreatic beta cells and the risk of increased blood sugar in the blood. Furthermore, in the body, if a person's blood sugar control is poor, the condition can lead to macroangiopathy, which will reduce circulation, one of which is in the large blood vessels in the lower extremity area so that they are at risk of developing diabetic ulcers (Edmonds et al., 2021). Classification of diabetic ulcer degrees is used to determine differences in wounds such as location, depth, presence of neuropathy or not, signs of infection, and ischemic conditions (Livingston, 2018). The results of this study showed that 50% respondents had grade 1 of diabetic ulcer, namely superficial ulcers and limited to the skin or subcutaneous tissue, and 38,5% respondents had grade 2 of diabetic ulcers, namely deep ulcers, translucent skin to the ligaments, tendons, and bone, without osteomyelitis or abscess (Livingstone, 2018).

This study showed a significant relationship between the dependent variable, spiritual needs, and the independent variables, which included age, marital status, length of the wound, and degree of diabetic ulcer with  $P < 0.05$ . Supported by research conducted by Emile Chaar in 2018, which stated that age was significantly related to spiritual needs, her study predicted that older respondents had more significant spiritual needs (Chaar et al., 2018). In addition, Chaar (2018) states in his research that there is a relationship between spiritual needs and marital status. The explanation is that someone married has better social functions and a better support system, while living alone is associated with increased fatigue, affecting fulfilment. spiritual needs (Chaar et al., 2018).

Research conducted by Pertiwi in 2020 found that most respondents had a low level of spirituality ( $n = 32$ , 78%). This difference is influenced by several factors, such as the length of illness, the patient's health status, and life experiences related to spirituality (Pratiwi et al., 2020). The duration of illness creates adaptations and affects their life experiences related to spirituality. Most patients are worried because their wounds have not healed within a specific time or have wounds with a high degree of injury that impacts their high spiritual needs. Some others convey a sense of sincerity and submission to the condition experienced. Patients must adjust to the state of their wounds and seek knowledge about how to pray when injured (Pratiwi et al., 2020).

Spirituality is a process of self-discovery to find and understand answers to life's problems, about meaning,

and about a deep relationship with God (MacKinlay, 2016). A person with diabetic ulcers tends to have problems carrying out spiritual practice because of physical limitations, usually caused by pain, weakness of mobilization, and an unpleasant odor accompanied by pus. Diabetic ulcer patients, apart from experiencing difficulties in carrying out spiritual activities, will also experience emotional disturbances (Jariah et al., 2021). When a person suffering from diabetes mellitus experiences complications of diabetic foot ulcers, the patient will experience lifestyle changes and physical limitations. That will impact the emergence of negative things as a psychological response to his condition, including anger, feelings of worthlessness, increased anxiety, and depression, so they need holistic nursing intervention from the physical, psychological, social, and spiritual aspects (Zahara et al., 2019). The spiritual nursing care provided allows individuals to adapt to current conditions, understand the meaning of each event and have a good relationship with themselves, others, the surrounding environment, and God (Imeni et al., 2018).

Stress conditions and negative emotions such as depression and anxiety, in addition to harming the wound-healing process, also negatively affect the systemic pro-inflammatory response in the body. For example, conducting Rodriguez & Gamboa's (2020) research found that a high-stress score shown to reduce the number of interleukins 1 and 8, which are essential components for regulating the production, release, and activation of metalloproteinases, which are critical in the process of tissue repair and wound healing. In addition, experimental studies in the area have shown that patients who receive treatment taking into account psychological, social, and spiritual aspects have shown shorter healing times, improved quality of life, increased patient self-esteem, and reduced pain (Rodriguez & Gamboa, 2020).

### **Conclusion**

Diabetic foot ulcer patients need adaptive spiritual coping to improve the patient's quality of life and accelerate the wound-healing process. Therefore, health workers in clinics/hospitals need to pay attention to the factors that affect the fulfilment of the spiritual needs of diabetic ulcer patients. They can provide comprehensive nursing care not only to provide care for the physical aspect but also to provide and prioritize the patient's psychological, social, and spiritual aspects. Furthermore, future research can be focused on the intervention and implementation of spiritual care.

### **Author's declaration**

The authors made substantial contributions to the conception and design of the study and took responsibility for data analysis, interpretation, and discussion of results. For manuscript preparation, all the authors read and approved the final version of the paper.

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### **Availability of data and materials**

All data are available from the authors.

### **Competing interests**

The authors have declared that no conflict of interest exists.

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