

Relationship of Stress with Self-Concept in Patients with Diabetic Foot Ulcer (DFU) at PKU Kitamura Clinic Pontianak

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Abstract— Diabetic foot ulcer is characterized by the emergence of ulcers in the lower extremities caused by peripheral neuropathy or peripheral artery disease which can then lead to amputation if not treated properly. Changes that occur in diabetics cause stress and each change can be a stressor that affects the self-concept of diabetic foot ulcers. To determine the relationship of stress with self-concept in patients with diabetic foot ulcer (DFU) in PKU Kitamura Clinic Pontianak. This type of research is quantitative correlative with the sampling method of research subjects using purposive sampling with a large sample of 82 respondents. This study used a cross-sectional design. Data collection using questionnaires. Data analysis method using chi-square test. The results showed that most respondents experienced moderate stress as many as 56 respondents (68.3%) and negative self-concept as many as 42 respondents (52.2%). Statistical test of the chi-square test results obtained the value of $p = 0.00 < \alpha = 0.05$. This study shows that there is a relationship between stress and self-concept in patients with Diabetic Foot Ulcer (DFU) in PKU Kitamura Clinic Pontianak.

Keywords— Stress, Self Concept, DFU.

I. INTRODUCTION

The International Diabetes Federation (IDF) organization estimates that there are at least 463 million people aged 20-79 years in the world suffering from diabetes in 2019 or equivalent to a prevalence rate of 9.3% of the total population at the same age. Based on gender, the IDF estimates that the prevalence of diabetes in 2019 is 9% in women and 9.65% in men. The prevalence of diabetes is estimated to increase with increasing age of the population to 19.9% or 111.2 million people aged 65-79 years. The figure is predicted to continue to increase to reach 578 million in 2030 and 700 million in 2045. The Southeast Asia region where Indonesia is located, ranks 3rd with a prevalence of 11.3%. IDF also projects the number of people with diabetes in the population aged 20-79 years in several countries in the world which has identified 10 countries with the highest number of sufferers¹. Patients with Diabetes Mellitus (DM) mostly experience complications and one of the complications of DM patients is Diabetic Foot Ulcer. Complications of diabetes mellitus, among others, can damage the liver, eyes, kidneys, nervous system, to disability and if diabetes is not treated properly then these complications can lead to poverty, poor quality of life and even death. This occurs due to anatomical, physiological, and biochemical changes.

DFU is one of the most feared chronic complications of diabetes mellitus, because it causes serious problems such as disability, morbidity, and mortality in DM patients². The average prevalence of diabetic foot ulcers in Indonesia is 12%³. Duration of suffering from diabetic foot wounds to heal is influenced by psychological stress causing negative emotional states including anxiety and depression, this prolongs the length of suffering from wounds through the hypothalamic response, psychological stress and the autonomic nervous system causing hyperglycemic conditions⁴. This condition of depression and anxiety refers to changes in self-esteem of diabetic foot ulcer patients⁵. Individual self-esteem of diabetic foot ulcers changes the standard of living and lifestyle so that desires, values are not fulfilled, belittled, feelings of rejection, social isolation due to smell and wound conditions. In this condition, powerlessness appears due to role dysfunction and feelings of being a burden to the family, referring to impaired self-esteem⁴. DFU (*Diabetic Foot Ulcer*) causes pain, impedes the patient's physical, emotional, and psychological mobility and causes sleep disturbances, depression, anxiety, and lack of self-care. This causes the patient to experience a stressful phase in dealing with the disease⁶. Various changes in health can cause physical and psychological disturbances for sufferers. Changes that occur in their bodies can cause stress and any changes in health can be a stressor that affects the sufferer's self-concept⁷. DFU patients who have undergone a treatment process, one of which is wound care, are expected to increase confidence in carrying out self-care because they are encouraged to be able to manage their disease effectively through positive factors, namely proper wound care techniques, proper clothing, hygiene, exercise and balanced rest, proper diet and medication as well as alcohol and smoking free, positive mental attitude, and others⁸. Continuous wounds that make a person feel less confident and even difficult to accept the situation they are in. So that there is a change in their self-concept due to one of the things that influence it, such as changes that occur in a person⁹.

II. OBJECTIVE

This study aims to determine the relationship between stress and self-concept in patients with diabetic foot ulcers (DFU) at PKU Kitamura Clinic, Pontianak.

III. METHODOLOGY

Study Design

This research is quantitative correlation with the research subject sampling method using purposive sampling, cross-sectional research design. This research test uses bivariate analysis using the chi-square test which is used to test the difference in the proportions (nominal data) of 2 events (events).

Population and Sample

The population of this study were patients with diabetic foot ulcers (DFU) at the PKU KITAMURA CLINIC, PONTIANAK. A total of 82 respondents.

Instrument

The research instrument used a Perceived Stress Scale (PSS) questionnaire and a self-concept questionnaire based on the Tennessee Self Concept Scale (TSCS).

Intervention

The intervention in the study started from November 2021 to August 2022. If at that time there were Diabetic Foot Ulcer patients who met the inclusion criteria, the researchers immediately took these patients as samples.

Data Collection

The data collection tools used in this study were informed consent, Perceived Stress Scale (PSS) questionnaire and self-concept questionnaire based on the Tennessee Self Concept Scale (TSCS). After the patient agreed, the researcher asked the patient to sign an informed consent form, after which the researcher conducted the study. This research has passed the STIK Muhammadiyah Pontianak ethical test with registration number 141/ILIAU/KET.ETIK/IV/2022. Univariate analysis was conducted to describe the characteristics of age, gender, educational history, history of patients suffering from diabetic foot ulcers, stress in patients with diabetic foot ulcers, self-concept in patients with diabetic foot ulcers. Bivariate analysis using chi-square test is used to test the different proportions (nominal data) of 2 events (events).

IV. RESULTS

1. Univariate analysis test

Based on Table 1, it can be seen that the characteristics of respondents based on age are 1 person (1.2%), age 36-45 years old there are 11 people (13.4%), age 46-55 years old there are 35 people (42.7%), aged 56-65 years there were 31 people (37.8%), aged >65 years there were 4 people (4.9%). The majority of respondents from this study were aged 46-55 years, namely 35 respondents (42.7%).

TABLE 1. Characteristics of Respondents Based on Age in Patients with Diabetic Foot Ulcers at PKU Kitamura Clinic Pontianak in 2022 (n=82)

Age	Frequency	Percentage
26-35	1	1,2%
36-45	11	13,4%
45-55	35	42,7%
56-65	31	37,8%
>65	4	4,9%
Total	82	100%

TABLE 2. Frequency distribution by gender with Diabetic Foot Ulcer Patients at PKU Kitamura Clinic Pontianak in 2022 (n=82)

Gender	Frequency	Percentage
Male	51	62,2%
Female	31	37,8%
Total	82	100%

Based on Table 2, it can be seen that the characteristics of respondents based on the gender of male respondents were 51 people (62.2%), while women returned to 31 people (37.8%). Respondents from this study were male as many as 51 people (62.2%).

TABLE 3. Distribution of respondent characteristics based on education with Diabetic Foot Ulcer Patients at PKU Kitamura Clinic Pontianak in 2022 (n=82)

Education	Frequency	Percentage
No school	3	3,7%
The elementary school	23	28,0%
Junior high school	16	19,5%
Senior high school	32	39,0%
Bachelor	8	9,8%
Total	82	100%

Based on Table 3, the characteristics of respondents based on education level are known to be 3 people (3.7%), elementary school as many as 23 people (28.0%), junior high school as many as 16 people (19.5%), high school as many as 32 people (39, 0%) and 8 colleges (9.8%). The majority of respondents in this study were high school education level with 32 respondents (39.0%).

TABLE 4. Characteristics of Respondents Based on Length of Suffering from DFU in patients with Diabetic Foot Ulcer (DFU) at PKU Kitamura Clinic Pontianak in 2022 (n=82)

Duration of Suffering from DFU in Diabetic Foot Ulcer (DFU) Patient	Frequency	Percentage
3-4 month	78	95,1%
>5 month	4	4,9%
Total	82	100%

Based on Table 4, it can be seen that the characteristics of respondents based on the length of suffering from DFU ranged from the length of suffering according to research inclusions, the majority of which were 3-4 months as many as 78 people (95.1%) and >5 month as many as 4 people (4.9%). The majority of respondents in this study were 3-4 months old as many as 78 respondents (95.1%).

TABLE 5. Stress on Diabetic Foot Ulcer (DFU) Patients at PKU Kitamura Clinic Pontianak in 2022 (n=82)

Stress level	N	Perasetase (%)
Mild Stress	26	31,7%
Moderate stress	56	68,3%
Total	82	100%

Based on Table 5, it can be seen that the results of the stress level of the respondents in this study with the highest stress level were in the moderate stress category, namely 56 respondents (68.3%), while respondents with mild stress levels were 26 respondents (31.7%).

TABLE 6. Self concept of Diabetic Foot Ulcer (DFU) Patients at PKU Kitamura Clinic Pontianak in 2022 (n=82)

Self concept	N	Percentage (%)
Positive	40	48,8%
Negative	42	51,2%
Total	82	100%

Based on Table 6, the education of the most respondents is senior high school with a total of 16 respondents (53.3%), The elementary school with a total of 7 respondents (23.3%), bachelor with a total of 6 respondents (20.1%) and junior high school with a total of 1 respondent (3.3 %).

2. Bivariate analysis test

TABLE 7. Relationship between stress and self-concept in patients with diabetic foot ulcers (DFU) at PKU Kitamura Clinic, Pontianak in 2022 (n=82)

		Self Concept			OR	P-value
		Positive	Negative	Total		
Stress	Mild Stress	25	126		68,333	0,00
	%	96,2%	3,8%	100%		
	Moderate stress	15	41	56		
%	26,8%	73,2%	100%			
Total		40	42	82		
	%	48,8%	512%	100%		

Based on table 7, it shows that the results of the analysis of the relationship between stress and self-concept in patients with diabetic foot ulcers (DFU) were obtained from 82 respondents who had mild stress with positive self-concept 25 respondents (96.2%), while mild stress with negative self-concept there was 1 respondent (3.8%) with a total of 26 respondents (100%). Moderate stress with positive self-concept 15 respondents (26.8%), while moderate stress with negative self-concept 41 respondents (73.2%) with a total of 56 respondents (100%). From the results of the analysis, OR = 68.333, which means that mild stress has 68.333 opportunities for positive self-concept compared to moderate stress.

V. DISCUSSION

Based on Table 1, the characteristics of respondents based on the number of respondents from this study were aged 46-55 years, namely 35 respondents (42.7%). The results showed that most of the incidence of DFU was found in respondents with middle adult age. In adults and older individuals, the body's ability to control blood glucose is less than optimal and causes a decrease in insulin secretion or resistance which results in macroangiopathy. This also affects a decrease in blood circulation, one of which is large or medium blood vessels in the blood vessels, making it easier to cause DFU¹⁰. According to the analysis, researchers at the age of 46-55 years will be more susceptible to DFU because the body's immunity has decreased and limited physical activity makes a person no longer productive in work and exercise.

Based on table 2, the majority of respondents from this study were male as many as 51 people (62.2%). the results of the study found that the frequency distribution of male sex was higher than female. The results of this study describe that males are more susceptible to diabetes mellitus than females due to unhealthy lifestyles such as smoking, drinking alcohol and

others¹¹. However, the results of this study are not in line with several other studies. This study states that type 2 diabetes mellitus in women is higher than in men, because physically women have a greater chance of increasing their body mass index. Monthly cycle syndrome (premenstrual syndrome), post-menopausal which makes the distribution of body fat easy to accumulate due to hormonal processes that occur in women, namely where there has been a decrease in the hormones estrogen and progesterone due to menopause¹². Estrogen basically functions to maintain a balance of blood sugar levels and increases fat storage, and progesterone which functions to normalize blood sugar levels and helps use fat as energy. The hormones estrogen and progesterone affect how cells respond to insulin. After menopause, changes in hormone levels will trigger fluctuations in blood sugar levels. This is what causes the incidence of DM to be higher in women than men⁷. According to the researcher's analysis that gender has an effect on the incidence of diabetes mellitus because the incidence of DM in women is higher, but in the incidence of DFU the researchers conclude that women and men equally influence the incidence of DFU, this is influenced by a lifestyle that unhealthy, lack of physical activity (exercise) and an unbalanced diet and do not routinely check blood sugar levels.

Based on Table 3 it can be seen that the majority of respondents in this study were high school education level with 32 respondents (39.0%). This study shows that a person's level of education is related to that person's ability to translate information into knowledge which then becomes the basis for taking an action¹³. According to the researcher's analysis, DFU is spread across all levels of education. Although having knowledge about diabetes or DFU does not guarantee that a person does not get this disease. The existence of awareness for healthy living, family and environmental support is very influential to avoid diabetes mellitus. The higher the level of education, the higher the information you have and have self-awareness to maintain health. Based on Table 4, it can be seen that the characteristics of the respondents based on the duration of suffering the majority of respondents in this study were 3-4 months as many as 78 respondents (95.1%). In line with this study, which states that the length of time suffering from a third degree wound on the Wagner scale is 52.98 days, the median length of injury is 45 days. The slow wound healing process makes long suffering from diabetic foot ulcers, resulting in physical symptoms such as pain, discomfort, social isolation, and decreased mobility. Long suffering from diabetic foot wounds to heal is influenced by psychological stress, then stress causes negative emotional states including depression and depression, then this condition can prolong the duration of suffering from injuries through hypothalamic, psychological and autonomic nervous system responses causing hyperglycemia. Blood glucose levels that are increasingly undirected will trigger problems related to blood vessels such as diabetic foot ulcers⁴. According to the researcher's analysis that the longer a person suffers from diabetes mellitus, the more at risk of complications so that diabetes mellitus is not controlled properly, then the possibility of complications in the form of DFU. The higher the severity of the wound, the longer the healing process, this is caused by non-compliance in wound

care, treatment and psychological influences experienced by the patient.

Based on Table 5, it can be seen that the results of the stress level of respondents in this study with the highest stress level were in the moderate stress category, namely 56 respondents (68.3%), while respondents with mild stress levels were 26 respondents (31.7%). This can be related to the length of suffering from DFU, the longer the patient suffers from DFU, the stress level of the patient increases due to the emotional problems experienced by the patient. High stress triggers increased blood sugar levels and also has an impact on the wound healing process. In line with this study which states that there is a relationship between self-acceptance and stress levels in people with diabetes mellitus. Negative self-acceptance affects the level of stress experienced by sufferers during illness. The emergence of stress refers to events that are felt to be harmful to the physical and psychological well-being of the sufferer. The illness causes the patient's quality of life to decrease and causes biological and psychosocial pressure so that it can cause stressful conditions. In this case it is necessary to develop programs to deal with stress and improve psychological health in people with diabetes mellitus¹⁴. Gender also plays a role in the occurrence of stress, there are differences in responses between men and women when dealing with conflict. The female brain has a negative awareness of conflict and stress, in women conflict triggers negative hormones that cause stress, anxiety and fear. Meanwhile, men generally enjoy conflict and competition, and even think that conflict can provide a positive boost. In other words, when women are under pressure, it is generally easier to experience stress¹⁵. According to the researcher's analysis, stress experienced by patients can change according to health conditions at that time. Stress on DFU clients is influenced by the treatment process, economic factors, and wound conditions. The greater the demand for treatment, the higher the stress experienced.

Based on Table 6, it can be seen that the results of the self-concept of respondents to the DFU Kitamura Clinic Pontianak PKU, positive self-concept of 40 respondents (48.8%) while respondents who had a negative self-concept were 42 respondents (51.2%). Changes that occur in patients with DFU make sufferers see themselves negatively. The higher the degree of diabetic foot injury, the more negative the self-concept you have, because the patient is dissatisfied with himself, does not have self-confidence and cannot do things like most people. Diabetic ulcers that do not heal for a long time will cause role disruption, which can interfere with one's self-esteem as it can reduce self-worth. The longer an illness that interferes with the ability to perform activities that support feelings of worth, the greater the effect on self-esteem. Sufferers often have difficulty adjusting to circumstances so that a person is in a crisis stage which is characterized by physical, social and psychological imbalances. This pressure will interfere with adaptation ability so that it will cause failure which will cause disturbed self-concept¹⁶. The results of this study are in line with other studies, which state that there is a relationship between diabetic ulcers and changes in self-concept in patients with type II diabetes mellitus at the ENT Center Makassar nursing home. Diabetic ulcer patients perceive negatively about

the state of the wounds on their bodies. Especially if it is accompanied by a severe degree of ulcer injury or an amputation so that there are some limbs that will be lost and make big changes in his life that will cause the way of evaluating himself to change, the level of independence of diabetic ulcer sufferers will also change so that they must receive help from others and carry out daily activities with the help of others¹⁷. According to the researcher's analysis that in patients with DFU will experience physical changes due to the influence of injuries and complications experienced. Shame, isolation, hopelessness, poor wound conditions will make sufferers less confident, decreased physical and economic activity and lack of knowledge this is what affects the patient's self-concept so that most people with DFU experience a negative self-concept.

Based on the results of table 7, it was found that the value of value = 0.000 is smaller than the value of (0.05) so that there is a relationship between stress and self-concept in patients with diabetic foot ulcers (DFU) at the Kitamura Clinic, Pontianak. This is caused by changes that occur in life ranging from changes in body parts, activities that do not necessarily run well, lack of family support becomes a stressor for sufferers so that stress appears and will make sufferers feel inferior and cannot accept the conditions experienced in connection with injuries suffered. Any changes in health can be a stressor that affects self-concept. In the study, it was found that 51.2% of respondents experienced negative self-concept starting from body image, self-esteem, self-ideal, self-identity and role. Respondents with negative body image stated that they did not like the changes in their bodies and considered their appearance to be unattractive. The age of the respondents, who are mostly 45-65 years old, is a supporting factor for poor body image, because the side effects of aging on the body are then added to changes in the state of the injuries experienced. The results of this study are in line with other studies, which state the relationship between stress and self-concept in patients with type 2 diabetes mellitus injuries at Arifin Achmad Hospital Pekanbaru, the results obtained are that some people with diabetes mellitus 63.3% of 30 respondents have a negative body image. Negative body image in people with diabetes mellitus with diabetic ulcers is due to changes in appearance and body function where the feet can no longer function normally and wounds will be difficult to heal so that patients perceive negative things about their body image⁷. The results of this study are in line with other studies which state that the majority of diabetics are as many as 63.6% of women, including sufferers aged 45-65 years (66.2%). In this study, it was found that the majority of respondents had poor self-acceptance (66.2%) and had moderate stress levels (68.8%). This means that if there is poor self-acceptance it causes negative self-assessment in front of other people so that it triggers increased levels of stress in people with diabetes mellitus, one of the factors related to the response of sufferers who say they lack confidence, feel different from other people. Others gave a different response. If this is allowed to continue, sufferers tend not to be independent in maintaining their health status¹⁴. According to the researcher's analysis that in this study there is a relationship between stress and self-concept in patients with

diabetic foot ulcers, where the higher the stress, the more negative a person's self-concept, the lower the stress, the more positive one's self-concept. Supporting factors of gender, age, education and long-suffering also influence the formation of self-concept. This happens due to poor self-perception of sufferers due to the disease they are experiencing. Individuals with a positive self-concept will more quickly accept the conditions they are experiencing compared to individuals with a negative self-concept. Support motivation for sufferers is very important to improve a good quality of life.

VI. CONCLUSION

The conclusion of the results of research conducted related to the relationship between stress and self-concept in patients with diabetic foot ulcers at the Pku Kitamura Clinic in Pontianak, with the following research results:

1. Description of the characteristics of respondents with Diabetic Foot Ulcer at the PKU Kitamura Pontianak Clinic is the average characteristic in the age category 46-55 years, namely 35 respondents (42.7%), male sex has a distribution of 51 people (62.2%), high school education level was dominant or more with 32 respondents (39.0%), duration of suffering 3-4 months was more dominant or more with 78 respondents (95.1%).
2. The stress of Diabetic Foot Ulcer sufferers at PKU Kitamura Pontianak Clinic was moderate with 56 respondents (68.3%).
3. The self-concept of diabetic foot ulcer sufferers at PKU Kitamura Pontianak Clinic was negative as many as 42 respondents (52.2%).
4. The results of the analysis show that there is a relationship between stress and self-concept in patients with diabetic foot ulcers at the PKU Kitamura Pontianak clinic, with the results of data analysis using the chi-square test with a value of $p = 0.00$, $\alpha < \alpha (0.05)$.

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REFERENCES

[1] International Diabetes Federation. WDD 2015 Campaign. Sara Webber. *International Diabetes Federation*. 2015.

[2] Mariam, T. G., Alemayuhu, A., Tesfaye, E., Mequannt, W., Temesgen, K., Yetwale, F., et al. (2017). Prevalence of diabetic foot ulcer and associated factors among adult diabetic patients who attend the diabetic follow-up clinic at the university of godar referral hospital, nort west ethiopia, 2016: institutional-based cross- sectional study. *Journal Of Diabetes Research*.

[3] Yusuf, S., Okuwa, M., Irwan, M., Rassa, S., Laitung, B., Thalib, A., et al. (2016). Prevalence and risk actor of diabetic foot ulcers in a regional hospital, eastern Indonesia. *Open Journal Of Nursing*, 6(1), 1-10.

[4] Wulandari, P., Diani, N., & Lestari, D. R. (2021). The relationship between the duration of injury and the self-esteem of diabetic foot ulcer patients. *Journal of Nursing and Health*, 9(1), 85-92.

[5] Bilous, R., & Donnelly, R. (2014). *Foot problems in diabetes: a diabetes handbook* (4th ed.). Jakarta: Bumi Medika.

[6] Lefrancois, T., Mehta, K., Sullivan, V., Lin, S., & Glazebrook, M. (2017). Evidence based review of literature on detriments to healing of diabetic foot ulcers. *Foot and Ankle Surgery*, 23(4), 215-224.

[7] Sofiana, L. I., Elita, V., & Utomo, W. (2012). The relationship between stress and self-concept in people with type 2 diabetes mellitus. *Journal of Nurses Indonesia*, 2(2), 167-176.

[8] Maryunani, A. (2013). *The most complete and up-to-date modern wound care: as a form of independent nursing action*. Jakarta: InMedia.

[9] Silin, A., Kardiatur, T., & Hartono. (2017). Self-concept of patients with diabetic foot ulcers (DFU) at Kitamura Pontianak clinic (phenomenological study). *Journal of Nursing and Health*, 8(1), 1-10.

[10] Saputri, A. D., Kusuma, H., & Erawati, M. (2020). Characteristics of diabetic foot ulcers (DFU) in individuals with diabetes mellitus (DM): study description - cross sectional. *Journal Of Holistic Nursing Science (HNS)*, 7(2), 88-98.

[11] Manurung, R. D., & Panjaitan, C. V. (2020). Description of patient characteristics

[12] diabetes mellitus who went for outpatient treatment at the internal polyclinic of H.Adam Malik General Hospital Medan in 2019. *POLTEKKES KEMENKES MEDAN*, 1-10.

[13] Zainuddin, M., & Utomo, W. (2015). Relationship of stress with quality of life type 2 diabetes mellitus. *Online Student Journal Program Nursing Studies, University of Riau*, 2(1), 890-898

[14] Maulida, H. (2017). Student perceptions of the use of google translate as a medium for translating English material. *Journal of Saintekom*, 7(1), 56-66.

[15] Yan, L. S., Marisdayana, R., & OR, R. I. (2017). Relationship of self-acceptance and stress levels in people with diabetes mellitus. *Journal of Endurance: Studies Scientific Health Problems*, 2(3), 312-322.

[16] Nasrani, L., & Purnawati, S. (2015). Differences in stress levels between men and women in yoga participants in the city of Denpasar. *Udayana Medical Journal*, 4(12), 1-7.

[17] Indriyati, Widiyono, & Asri, S. R. (2021). Diabetic wound relationship with concept self in patients with diabetes mellitus. *Journal of Indonesian Nursing Science (JIKI)*, 14(1), 7-12.

[18] Qasim, M., & Mappeboki, S. (2021). Relationship of diabetic ulcers to changes in self-concept in people with type II diabetes mellitus at home ENT treatment center Makassar. *Student Scientific Journal & Research Nursing (JIMPK)*, 1(2), 149-156.