Case Report

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Case Report

Nursing Care for People with Diabetes Mellitus Type 2 in Relation to Safety and Protection Needs

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Abstract: Diabetes mellitus (DM) is a condition in which the body is unable to produce or manage insulin, resulting in hyperglycemia. Diabetes mellitus has been shown to induce a decrease in the vascularization of small blood vessels, leading to slowed blood flow in the extremities (Wijaya & Putri, 2015). The objective of this study was to provide nursing care to patients with Type 2 Diabetes Mellitus in meeting their safety and protection needs at the Inpatient Ward of Kediri Baptist Hospital. The study design was a case study involving two respondents. The research was conducted by providing comprehensive nursing care over a two-day period, followed by a comparative analysis of theory and facts in the two cases. The research test employed data triangulation from patients treated over two days with foot exercises and foot care interventions. The findings of the study indicated that both respondents exhibited symptoms of numbness in their feet, which led to a nursing diagnosis of risk of skin/tissue integrity impairment, as indicated by alterations in circulation. The interventions administered to both groups included diabetes foot exercises and foot care. The findings indicated that both respondents demonstrated proficiency in performing diabetes foot exercises. The patient outcomes met the established criteria, as evidenced by the successful performance of diabetes foot exercises by both respondents and a notable reduction in foot numbness. The provision of nursing care, including interventions such as diabetes foot exercises and foot care, has been demonstrated to be an effective strategy for the prevention of wound occurrence. The foot exercises and foot care procedures were implemented on both subjects to mitigate the risk of skin/tissue integrity disorders.

Keywords: diabetes mellitus; nursing care plan; foot excercise; safety and protection needs

Introduction

Diabetes mellitus (DM) is a condition in which the body is unable to produce or use insulin (a hormone that carries blood glucose to cells and stores it as glycogen), resulting in hyperglycemia (Aini & Aridiana, 2016). In patients with Diabetes Mellitus, high blood sugar levels can cause damage to the nervous system and blood vessels, leading to slowed blood circulation in the feet and resulting in foot ulcers. Therefore, in patients with Type 2 Diabetes Mellitus, safety and protection measures must be ensured to prevent foot ulcers (Khaerunnisa & Rahmawati, 2019).

According to data from the International Diabetes Federation (IDF) in 2019, there were 463 million adults (aged 20–79) worldwide with diabetes mellitus. The prevalence of diabetes mellitus increased by 19.9%, with 111.2 million people aged 65–79 years (Pangribowo, 2020). According to the results of the Basic Health Research (Riskesdas) in 2018 in East Java, the prevalence of Diabetes Mellitus was 2.5% of the total population of East Java, with approximately 151,878 people diagnosed with Diabetes Mellitus (Riskesdas, 2018). Preliminary research conducted by the researcher on January 31, 2023, in the Efrata and Wijaya Kusuma Rooms of Kediri Baptist Hospital revealed data from October to December 2022 showing 65 patients with Type 2 Diabetes Mellitus. Interviews conducted by the researcher with nurses in the Efrata and Wijaya Kusuma Rooms of Kediri Baptist Hospital on patients with Type 2 Diabetes Mellitus (without wounds) revealed an increase in blood

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glucose levels (hyperglycemia) accompanied by symptoms such as weakness, nausea, loss of appetite, and tingling in the legs.

Risk factors for Type 2 Diabetes include obesity, age, genetic factors, and ethnic group. The pathological characteristics of Diabetes are caused by insufficient insulin, meaning reduced glucose utilization by body cells, leading to elevated blood glucose levels (hyperglycemia). (Mahanani, 2016) Hyperglycemia in patients with Diabetes Mellitus causes thickening of blood vessel membranes and neuropathy, leading to impaired peripheral circulation, which can slow blood flow and result in wounds. This presents nursing care issues such as the Risk of Skin/Tissue Integrity Impairment (Wijaya & Putri, 2015).

The role of nurses in implementing care focused on meeting the safety and protection needs of patients with Type 2 Diabetes Mellitus to prevent wounds is through self-care measures such as diabetes foot exercises and foot care. Diabetes foot exercises are actions that can be performed to improve blood circulation and as an early preventive measure against wounds. Diabetes foot exercises can help improve blood circulation, strengthen small foot muscles, and lower blood glucose levels (Maria, 2021). These exercises can be performed three times a week for 20–30 minutes (Widiawati et al., 2020). Meanwhile, foot care that can be performed on diabetes mellitus patients includes washing and cleaning the feet and performing nail care (Hidayat & Nurhayati, 2014).

Methodology

The research design used in this study is a case study. Data collection on May, 2023. The research subjects in this case study consisted of two adult patients with Type 2 Diabetes Mellitus (without wounds) who experienced problems in meeting their safety and protection needs. Data collection was conducted through interviews, observations, and document reviews. The results of the data validity test on the patients, nurses, and families of both respondents indicated that the respondents experienced nursing problems related to the risk of skin/tissue integrity disorders. Data collection preparation was conducted after obtaining permission from the Chair of the Health Research Ethics Committee (KEPK) of STIKES RS Baptis Kediri, following the issuance of an ethical approval letter after an ethical review, with the reference number 017/10/IV/EC/KEPK-1/STIKESRSBK/2023.

Results

Nursing Assessment

The primary complaint reported by The First Patient is numbness in the legs when standing. The patient reported a history of Diabetes Mellitus since 2013, which is 10 years ago. However, during the course of her Diabetes Mellitus, the patient has never undergone regular check-ups or blood sugar tests.

Physical examination revealed the following findings: general condition good, temperature: 36.7°C, pulse: 20 beats per minute, respiration: 94 breaths per minute, blood pressure: 130/90 mmHg. Blood sugar test results on May 11, 2023, showed fasting blood sugar of 180 mg/dL and postprandial blood sugar (GD2JPP) of 181 mg/dL. The lower extremities of the legs appeared dry, with calluses on both soles of the feet, thick calluses on both lower legs, and cracked skin. both upper legs appear dark, and the tips of the toes appear pale. The patient is receiving Apidra 7 U and Sansulin 17 U therapy.

The Second Patient is 58 years old, male, with a primary school education, employed as a farm laborer, residing in Tegalan Kandat, Kediri District.

The main complaint reported by Patient is that his feet often feel numb, and the soles of his feet and toes feel tingly.

The patient's medical history indicates that he has had diabetes mellitus for the past 15 years. He regularly undergoes monthly check-ups and blood sugar tests and uses insulin at a dose of 3-4 units SC. Five years ago, the patient sustained a foot injury from a hoe while working in the rice field,

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with a wound measuring approximately 5 cm in length on the left foot sole. The wound required one year of treatment to heal.

Physical examination revealed general weakness, temperature: 37°C, pulse: 20 beats per minute, pulse: 96 beats per minute, blood pressure: 130/90 mmHg. Blood sugar levels on May 24, 2023, showed fasting blood sugar of 204 mg/dL and postprandial blood sugar (GD2JPP) of 215 mg/dL. The lower extremities of the legs appear dry, with calluses on both soles of the feet, both legs have thick calluses and cracked skin, both upper legs appear dark, there is a 5 cm long scar on the left sole, the patient received Novorapid 6 U SC and Levemir 15 U SC therapy.

Nursing Diagnosis

The nursing diagnosis for Patient I is risk of skin/tissue integrity impairment, evidenced by circulatory changes. The patient reports numbness in the legs when standing, both upper legs appear darkened and slightly swollen, the tips of the toes appear pale, and all finger creases are dry and cracked. and both lower legs have thick calluses and cracked skin.

The nursing diagnosis for Patient II is risk of skin/tissue integrity impairment, evidenced by changes in circulation, the patient reports frequent tingling in the legs, numbness in the soles of the feet and toes, all toe creases are dry and cracked, both lower legs have thick calluses, both upper legs appear dark, and there is a 5 cm scar on the left sole.

Nursing Interventions

The interventions provided to both respondents are in accordance with the theory (PPNI, 2017), namely: Identify routine foot care, check for irritation, cracks, lesions, calluses, deformities, or edema, Checking nail thickness and color changes, Monitoring foot moisture levels, Monitoring blood sugar levels, Soaking the feet in warm water, drying the feet, and applying moisturizer, Performing diabetic foot exercises, Informing the importance of foot care, Teaching how to prepare and cut nails, Advising to wear shoes of appropriate size, Advising the importance of foot examinations, especially when sensation decreases.

Implementation of Nursing Care

Nursing interventions were implemented over two days: on May 11–12, 2023, for Patient I, and on May 24–25, 2023, for Patient II, in accordance with the planned interventions.

The implementation on the first and second days for both respondents with Type 2 Diabetes Mellitus and nursing care issues related to skin/tissue integrity risk, evidenced by changes in circulation, included: Identifying routine foot care practices, observing the presence of irritation, cracks, lesions, calluses, deformities, or edema, observing nail thickness and color changes, monitoring foot moisture levels, and monitoring blood sugar levels. Soaking the feet in warm water, drying between the toes, and applying moisturizer, performing diabetic foot exercises, informing the importance of foot care, teaching how to prepare and cut nails, recommending wearing shoes of the appropriate size, and emphasizing the importance of foot examinations, especially when sensation decreases.

Evaluation

Nursing evaluation using the SOAP method (Subjective, Objective, Assessment, Planning) is conducted at the end of each shift.

The evaluation obtained from Respondent I with the nursing issue of skin/tissue integrity risk was evidenced by changes in circulation on the first day, with subjective patient data stating that the feet were still tingling and numb. Objective data obtained included both upper legs appearing darkened and slightly swollen, pale fingertips, and the feet feeling slightly moist after applying

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moisturizer/lotion. The assessment findings indicated that the risk of skin/tissue integrity impairment was partially resolved, and the plan included continuing interventions such as performing diabetic foot exercises and foot care. Meanwhile, the evaluation obtained from Respondent II with the nursing issue of risk of skin/tissue integrity impairment was evidenced by changes in circulation on the first day, with the patient reporting reduced tingling. Objective data obtained showed that both upper legs appeared dark, the legs were slightly moist after applying moisturizer/lotion, and the feet and nails appeared cleaner. The assessment data indicated that the risk of skin/tissue integrity issues was partially resolved, and the intervention plan included continuing with diabetes foot exercises and foot care.

Evaluation from Respondent I with the nursing issue of skin/tissue integrity risk was evidenced by changes in circulation on the second day, with subjective patient data indicating reduced tingling in the legs and the legs feeling lighter. Objective data obtained showed that the darkening on the upper parts of both feet had decreased, dryness had decreased, and the feet were slightly moist after applying moisturizer/lotion, resulting in assessment data indicating that the risk of skin/tissue integrity issues was partially resolved. In the plan, intervention data was obtained and continued in room care. Meanwhile, the evaluation from Respondent II with the nursing issue of skin/tissue integrity impairment risk was evidenced by improved circulation on the second day, with subjective patient data indicating reduced tingling. Objective data obtained include reduced darkening on the upper part of the legs, legs appearing moist after applying moisturizer/lotion, and legs and nails appearing cleaner. The assessment indicates that the risk of skin/tissue integrity issues has been partially addressed, and the intervention plan includes continuing care in the ward.

Discussion

Nursing Assessment

The nursing assessment of safety and protection needs for Patient I and Patient II with a medical diagnosis of Type 2 Diabetes Mellitus was consistent with existing theory, with the nursing issue being the risk of skin/tissue integrity impairment.

Nursing Diagnosis

According to the Indonesian Nursing Diagnosis Classification (SDKI, 2017), the nursing diagnosis for patients with Diabetes Mellitus is risk of skin/tissue integrity impairment, evidenced by changes in circulation.

Both respondents have the same nursing diagnosis, namely risk of skin/tissue integrity impairment evidenced by circulatory changes; however, subjective data revealed different complaints in each respondent. The complaints reported by Respondent I were frequent tingling in the legs and a numb sensation when standing. Meanwhile, Respondent II reported frequent tingling in the legs and a numb sensation in the soles of the feet.

According to the researcher, there was no difference between theory and fact in both respondents because both respondents had the same nursing problem, namely risk of skin/tissue integrity impairment evidenced by changes in circulation.

Nursing Interventions

According to the Indonesian Nurses Association (PPNI, 2017), there are 11 interventions that can be provided to patients with Type 2 Diabetes Mellitus to meet safety and protection needs, including: Identifying routine foot care practices, Checking for irritation, cracks, lesions, calluses, deformities, or edema, Checking nail thickness and color changes, Monitoring foot moisture levels, Inform the importance of foot care, Teach how to prepare and cut nails, Recommend wearing shoes of appropriate size, Recommend the importance of foot examinations, especially when sensation decreases.

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The interventions provided to both respondents align with the theory of Foot Care. According to the researcher, foot care and foot exercises are effective for patients with Type 2 Diabetes Mellitus because foot care and foot exercises can improve blood circulation and also serve as early prevention measures against foot ulcers.

Implementation of Nursing Care

The nursing care provided to both respondents consisted of self-care interventions, namely foot exercises and foot care, aimed at improving circulation and preventing ulcers.

According to the researcher, in addition to performing foot exercises and foot care, both respondents were provided with health education about diabetes knowledge, regular exercise, routine blood sugar checks, and regular medication intake. The patients and their families were able to understand the health education provided, and the patients were able to repeat the steps of the diabetes foot exercises and foot care that had been explained.

Evaluation

The Indonesian Nursing Outcomes Standards (PPNI, 2017) state that the criteria for resolving the nursing problem of skin/tissue integrity risk are decreased elasticity, increased hydration, improved tissue perfusion, decreased skin layer damage, decreased abnormal pigmentation, and improved sensation.

Based on the facts and theory above, the evaluation of the implementation of foot exercises and foot care for the nursing problem of risk of skin/tissue integrity impairment was partially resolved on the second day of nursing care, as evidenced by achieved elasticity, hydration, tissue perfusion, and sensation.

Conclusion

Assessment of Patient I and Patient II, patients with Type 2 Diabetes Mellitus, showed that safety and protection needs were met. According to theory and facts, a nursing issue related to the risk of skin/tissue integrity impairment was identified, evidenced by changes in circulation.

Nursing diagnoses consistent with theory obtained from Patient I and Patient II include the following: risk of skin/tissue integrity impairment evidenced by circulatory changes, unstable blood glucose levels related to impaired glucose tolerance, and knowledge deficit related to lack of exposure to information about the disease and its management. There is no discrepancy between Patient I and Patient II.

Nursing interventions for Patient I and Patient II included 11 interventions. The planned interventions were appropriate for the patients' conditions. The nursing interventions implemented for both respondents, Patient I and Patient II, were diabetic foot exercises and foot care.

The nursing evaluation for Patient I and Patient II showed that the following outcomes were achieved: skin elasticity, hydration, tissue perfusion, skin layer integrity (not yet achieved), abnormal pigmentation, and sensation.

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