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The Influence Combination of Dragon Fruit Juice (Hylocereus Polyrhizus) and Foot Exercise Therapy on Elderly with Diabetes Melitus in Kemutug Kidul Village Baturraden: Case Study



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ABSTRACT

Background: Diabetes Mellitus (DM) is a chronic disease characterized by blood glucose (blood sugar) levels exceeding normal, namely blood sugar levels at or above 200 mg/dl and fasting blood sugar levels of 126 mg/dl. The treatment needed to manage diabetes mellitus patients is by implementing healthy living behaviors such as maintaining a diet and running a treatment program. The effects of pharmacological therapy treatment such as flatulence, nausea and dizziness. Therefore, it is necessary to introduce other alternative therapies to overcome diabetes mellitus in the elderly, namely by using dragon fruit juice therapy and diabetic foot exercise therapy.

Method: Case study by applying implementation in accordance with evidenced based practice in nursing care. After intervening by giving dragon fruit juice and diabetic foot exercise therapy for a week to two managed clients. **Discussion:** The results obtained for one client decreased along with being able to regulate dietary patterns while the other did not experience a decrease due to not being able to maintain dietary patterns and regulate a good diet.

Result: Knowing the effect of giving dragon fruit juice combined with diabetic foot exercise therapy to overcome diabetes mellitus in the elderly

Conclusion: Strategies to treat diabetes mellitus using dragon fruit juice and diabetic foot exercise therapy succeeded in reducing blood glucose levels by regulating dietary patterns.

Keywords: Diabetes Mellitus, Elderly, Provision of Dragon Fruit Juice, Diabetic Foot Exercise Therapy

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INTRODUCTION

Diabetes Mellitus (DM) is a chronic disease characterized by blood glucose (blood sugar) levels exceeding normal, namely blood sugar levels at or above 200 mg/dl and fasting blood sugar levels of 126 mg/dl. The treatment needed to manage diabetes mellitus patients is by implementing healthy living behaviors such as maintaining a diet and running a treatment program. The effects of pharmacological therapy treatment such as flatulence, nausea and dizziness. Therefore, it is necessary to introduce other alternative therapies to overcome diabetes mellitus in the elderly, namely by using dragon fruit juice therapy and diabetic foot exercise therapy. Knowing the effect of giving dragon fruit juice combined with diabetic foot exercise therapy to overcome diabetes mellitus in the elderly. Case study by applying implementation in accordance with evidenced based practice in nursing care. After intervening by giving dragon fruit juice and diabetic foot exercise therapy for a week to two managed clients. The results obtained for one client decreased along with being able to regulate dietary patterns while the other did not experience a decrease due to not being able to maintain dietary patterns and regulate a good diet. Strategies to treat diabetes mellitus using dragon fruit juice and diabetic foot exercise therapy succeeded in reducing blood glucose levels by regulating dietary patterns.

The elderly are people who reach the age of 60 years and above. Elderly age is the final stage of the continuous aging process which is characterized by a decrease in physical endurance and is vulnerable to nests of disease. One of the disease problems resulting from the aging process is Diabetes Mellitus (Akbar, F et. al 2021). The International Diabetes Federation in 2022 reported that 537 million adults (20-79 years) were living with diabetes worldwide. This number is expected to increase to 643 million by 2045 (IDF, 2021). The Ministry of Health reported that there were 19.47 million people with diabetes mellitus in 2021 (Indonesian Ministry of Health, 2022). The prevalence of diabetes mellitus in Central Java province ranks second after hypertension at 20.57% (Health Profile of Central Java Province, 2018).

Symptoms complained of in patients with diabetes mellitus can be divided into acute and chronic. Acute symptoms include polyphagia (eating a lot), polydipsia (drinking a lot), polyuria (urinating a lot / often urinating at night), increased appetite but weight continues to decrease rapidly 10-15 kg within 2-4 weeks, and will often feel easily tired. As for the chronic symptoms of diabetes mellitus, namely tingling, pain in the foot area, and feeling numb. (Fatimah, n.d 2019).

Good management and minimizing the number of sufferers by behaving a healthy life by maintaining diet, a reducing anxiety, and stress and the most important thing is compliance in carrying out diabetes mellitus treatment. Pharmacological therapy treatment program by administering hypoglycemic drugs including oral sulfonylureas, biguanids, alpha, glucosidase inhibitors and insulin sensitizing and insulin injections. (Fatimah, n.d 2019). Many side effects of pharmacological therapy such as flatulence, sometimes accompanied by nausea and feeling the body does not feel good. So that it makes the elderly not consume drugs irregularly (Zhou et al., 2020). So from what the client feels, non-pharmacological therapy is needed to manage actions that have an effective effect on reducing blood sugar levels.

There are several kinds of fruits and plants that can lower blood sugar such as bitter melon, tapak dara root, aloe vera and dragon fruit. One that can be used to improve the diet of people with diabetes mellitus is dragon fruit which has the effect of controlling hypoglycemia so it is good for controlling blood sugar levels. In addition, there are non-pharmacological therapies that are psychomotor in nature, namely diabetic foot exercise therapy which is carried out for diabetics who move muscles, joints, and vesicles. This activity is carried out to improve blood circulation in the legs and strengthen the leg muscles and prevent foot deformities (Yulianti & January, 2021).

Based on data from the Baturraden 2 Health Center, the number of elderly people suffering from diabetes mellitus in Kemutug Kidul Village was recorded as 7 out of 390 elderly people. The results of the assessment were carried out because the patient was not

routinely controlled and rarely took medicine. The reason the client did not take as recommended was because when consuming felt nausea, flatulence and body discomfort.

Therefore, researchers are interested in introducing other methods that can be used to control client diabetes mellitus. Using alternative herbal complementary therapy with the administration of red dragon fruit juice and combination with diabetic foot exercise therapy to find out if there is an effect on lowering blood sugar in patients with diabetes mellitus.

METHOD

The method used in this research is a case study with the intervention of giving dragon fruit juice and diabetic foot exercise therapy for 7 days to 2 respondents with criteria aged more than 60 years and having diabetes mellitus. A thorough assessment of the two patients found complaints of weakness, fatigue, dizziness, and frequent urination at night and the following blood sugar levels of each client when assessed, namely client Mrs. K with a total of 504 mg/dL while client Mrs. S with a total of 418 mg/dL.

The first stage of implementation is the implementation stage of the nursing care plan to help clients achieve goals. Implementation was carried out for 7 days from May 02-08, 2023. In implementing the implementation, the author must have the ability to communicate therapeutically, advocacy skills, psychomotor and evaluation. The first stage of implementation is that the author prepares print media for diabetes mellitus education with the application of diabetic foot exercise therapy and prepares dragon fruit ingredients for juicing. Furthermore, teaching complementary therapy, namely diabetic foot exercise therapy to clients and families. Then the family gives the client the opportunity to do diabetes foot exercise therapy independently. Furthermore, measuring blood sugar levels before intervention. The next stage of implementation is carried out for 7 days given the implementation of diabetic foot exercises that have been taught providing dragon fruit juice therapy for client consumption, and on the last day a post test is carried out to measure whether there is a decrease in blood glucose levels after the intervention for 7 days.

RESULT AND DISCUSSION

Based on the table above, it can be that during the 7-day seen implementation of the results, the blood sugar levels of Mrs. K's clients decreased even though they were still in the high category with the previous blood sugar level value of 504 mg/dL to 298 mg/dL, while for Mrs. S tended to rise even though Mrs. S always drank dragon fruit juice therapy and always applied diabetic foot exercise therapy but tended to rise, because even though she had been given education about diet and maintaining a diet. Mrs. S tends not to maintain her diet during the 7-day intervention. It was found that Mrs. S always consumes foods that contain sugar such as Eid cookies and canned cakes, and always consumes fried foods and can run out of 5-8 pieces of fried foods every day, it was also found that Mrs. S always eats rice 3 times a day in large enough portions and does not reduce carbohydrate consumption.

In the results of the research that has been obtained, the combination of herbal therapy with the administration of dragon fruit juice and diabetic foot exercise therapy for 7 days obtained results for Mrs. K has decreased while Mrs. S has increased. The results of this study are in line with research by [Setyani et al, 2019] which states that the administration of dragon fruit juice or *Hylocereus polyrhizus* provides considerable benefits in reducing blood glucose levels for people with diabetes mellitus. The results of this study state that dragon fruit juice therapy can reduce blood glucose levels because it is known that dragon fruit is rich in antioxidants and contains many substances such as calcium, beta-carotene, vitamin B1, vitamin B2, vitamin C, phosphorus and flavonoid substances. Dragon fruit has the potential to inhibit free radicals because it contains betasianin and helps reduce blood glucose levels and can prevent the risk of heart disease in diabetics (Putra et al. 2019), Dragon fruit also contains high fiber, besides that dragon fruit also contains lycopene compounds, which are red pigments. Lycopene can affect insulin hormone resistance so that the body's tolerance to glucose increases. The fiber contained in dragon fruit can bind water so that glucose is less likely to come into contact with the intestinal wall and enter the blood (Setyani et al 2019). Then the pancreas will produce less insulin because the glucose levels that enter the blood are small so that there is a decrease in blood glucose levels. This is in line with research conducted (Poolsup et al 2019) that the effect of dragon fruit with higher doses has a greater

tendency to decrease blood glucose in patients with diabetes mellitus, Marked by clients who carry out the intervention, the feeling of weakness begins to decrease, nausea decreases flatulence decreases, clients rarely feel sick. In addition, red dragon fruit (*Hylocereus polyrhizus*) contains vitamin C and high water content which is about 9.4 mg and 90.20% Dragon fruit also contains flavonoids phenolic and polyphenol chemical compounds. According to Nuari et al (2017) the flavonoid content in red dragon fruit can reduce blood glucose levels. In addition the content of isoflavones in flavonoid compounds can reduce the risk of heart disease, kidney diabetes and osteoporosis.

Discussion

with the addition of diabetic foot gymnastics therapy which functions The foot gymnastics requires oxygen and can help improve blood circulation, strengthen the small muscles of the feet, prevent foot deformities that can increase the potential for diabetic wounds in the feet, and increase insulin production which is used in transporting glucose to cells so that it helps lower glucose in the blood According to Awaluddin & Sugiyanto, (2022) the foot movements performed during diabetic foot exercises which are carried out routinely are the same as doing foot massage, namely applying pressure and movement to the feet to affect the increase in secretion of the endorphin hormone which functions to reduce pain, reduce the circumference of edema in both calves, and vasodilation of blood vessels so that there is a decrease in blood pressure. especially systolic brachialis.

For people with DM. the implementation of diabetic exercises must be done regularly and slowly, starting first with 5-10 minutes per day. Then increase the time a little more each week so that the body will be able to adapt. During the research, the effect that was felt directly. after the respondents did this diabetic foot exercise was that the numbness/strength that was often felt by some respondents was starting to decrease. The aches felt by the respondents after doing this foot exercise began to decrease and the respondents felt that the leg muscles. especially the calf muscles became firmer and the stiffness of the joints in the ankles began to decrease.

Based on the data that has been obtained, of the two clients who carried out the same intervention for Mrs. K. the blood glucose level successfully decreased. However, for the treatment of Mrs. S, blood glucose levels still tend to fluctuate.

Due to non-compliance in maintaining a diet. Obtained from the results of the assessment of clients consuming food 3 spoons of vegetables, protein sources and carbohydrate sources (white rice) are excessive 3 times a day in moderate portions, not including snacks and sweet drinks consumed every day such as sponge cakes, pastries, fried foods.

Furthermore, the age factor can also affect the occurrence of diabetes mellitus as evidenced by the fact that both clients Mrs. K who is 63 years old while Mrs. S is 70 years old have an increased risk of diabetes along with age. In accordance with research conducted by Komariah & Rahayu (2020), that along with age, especially at the age of more than 40 years, it can be caused by an increase in blood glucose levels due to the aging process causing a decrease in the ability of pancreatic β cells to produce insulin. This is based on the fact that age 245 years can increase the incidence of diabetes mellitus because aging can reduce insulin sensitivity so that it can affect blood glucose levels.

Furthermore, the presence of hypertension also affects the occurrence of diabetes mellitus with evidence in both clients that client Mrs. K has a blood pressure of 149/82 mmHg while Mrs. S has a blood pressure of 174/89 mmHg. In accordance with research conducted by Pratama Putra et al (2019), that hypertension is a major risk factor for diabetes mellitus. The relationship with diabetes mellitus is very complex. hypertension can make cells insensitive to insulin (insulin resistant).

CONCLUSION

Non-pharmacological therapy provided, namely the administration of dragon fruit juice combined with diabetic foot exercise therapy is proven to reduce blood glucose levels in patients with diabetes mellitus accompanied by a well-regulated diet. After the intervention is applied, it is evidenced that the client feels better, the feeling of weakness begins to decrease, nausea decreases, flatulence decreases, the client rarely feels cramped. and the leg aches felt by the respondent after doing this foot exercise begin to decrease and the respondent feels the leg muscles. especially the calf muscles. become

firmer and joint stiffness and tingling in the ankle begin to decrease.

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