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The Effect of Hydrotherapy on Reducing Blood Sugar Levels in Patients with Diabetes Mellitus

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A B S T R A C T

Hydrotherapy is a method of treatment and healing using water. In this case the nurse encourages the patient to increase fluid intake orally and monitor fluid status by consuming water to help the process of removing all toxins in the body, including excess sugar. Purpose: to determine whether there is an effect of hydrotherapy (drinking water) on reducing blood sugar levels in patients with type 2 diabetes mellitus. This research method is literature review to the method of collecting library data. The data is obtained from previous research. The results of research on 10 database-based journal research articles show that there is an effect of hydrotherapy (drinking water) on reducing blood sugar levels in people with diabetes mellitus as many as 9 journals significantly, and only 1 journal has no significant effect but shows a decrease in average blood sugar from before intervention and after intervention. Conclusion: 9 Journals (90%) There is an effect of giving hydrotherapy to decrease blood sugar levels, P-Value is significant < 0.05 and 1 Journal (1%) there is no effect of giving hydrotherapy to decrease in blood sugar levels in patients with diabetes mellitus P Value > 0.05.

INTRODUCTION

The results of the 2018 Riskesdas show that the prevalence of Diabetes Mellitus (DM) in Indonesia based on a doctor's diagnosis in the population aged 15 years is 2%. Almost all provinces showed an increase in prevalence from 2013 to 2018, except for the province of East Nusa Tenggara (0,9%). There are 4 provinces with the highest prevalence, namely DKI Jakarta (3,4%), East Kalimantan (3,1%), Yogyakarta (3,1%), and North Sulawesi (3%). Based on gender, the prevalence of diabetes in 2018 was 1,2% male and 1,8% female (Kementerian Kesehatan Republik Indonesia, 2018).

Efforts to prevent and treat DM in Indonesia need to be done so that people who already suffer from this disease do not experience complications so that premature death does not occur (Bistara, et al., 2022). The need for efforts to manage this disease must be realized by various parties, both from health workers and the patients they treat, so that complications do not occur and develop, which result in health and endanger the lives of patients. Acute complications are a significant contributor to mortality, costs, and poor quality of life. Types of complications caused such as damage to the eyes, nerves, and kidneys, while macrovascular, which occurs when DM has caused damage to large blood vessels, can cause blood flow disorders, heart disease, and stroke (Bistara *et al.*, 2020).

Along with the development of the current era, other therapies have been found to help overcome the health problems of DM patients, namely complementary therapies. Complementary therapy that can be

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used in the treatment of Diabetes Mellitus is Hydrotherapy (drinking water). Consumption of water helps the process of removing all toxins in the body, including excess sugar (van Dam *et al.*, 2020).

METHOD

This research design uses a literature study or literature review method with a series of activities related to the methods of collecting library data, reading, and taking notes, and managing writing materials. Literature Review is a writing design by searching for literature from that have been published and reviewed. The Literature Review provides answers and opinions that have been found in previous and current research. This literature search uses data or previous sources obtained from journal databases. By using the keywords Hydrotherapy, blood sugar levels (Blood Sugar Level) and Type 2 Diabetes Mellitus. After obtaining the journals/articles selected using the Inclusion Criteria and Exclusion Criteria, the journals obtained according to the inclusion criteria are 10 journals. The data obtained will be used in the discussion that will answer all the problems that exist in this study.

Table of Inclusion Criteria and Exclusion Criteria

Criteria	Inclusion	Exclusion
Period Journal	2017-2021	Other 2017-2021
Language	Indonesian and English	Other Indonesian and English
Subyek	Patient with Diabetes Mellitus	Patient without Diabetes Mellitus
Intervension	Application of Hydroterapy	Application of other Intervention
Outcome	Blood Sugar	Other Blood Sugar

RESULT

Table of Result

No.	Author/year	Journal title	Method (Design, Sample, Variable, Instrument, Analysis)	Result
1	Hadinata, 2022	Hydrotherapy management of the decrease in blood sugar levels when in patients with Diabetes Mellitus Type 2	D = Descriptive Quantitative S = 10 sample V = Hydroterapy, Diabetes Mellitus type 2, I = Level Measurement When blood sugar use check tool GDS and sheets observation A = Data analysis use Observation sheet	There is an effect before and after Hydrotherapy with an average of 509 mg/dl to 271 mg/dl.
2	Tarigan, 2021	The effect of hydrotherapy on decreasing blood sugar levels in patients with type 2 diabetes mellitus at the Binjai Serbangan Public Health Center, Asahan Regency 2020.	D = Quasi Experimen, Two grup pretest post test design. S = 22 sample V = Hydroterapy, Diabetes Mellitus type 2, I = Data collection Using sheet observation and sugar measurement blood. A = independent T test	There is a significant effect with P-Value 0,00 < (P Value 0,05)
3	Siswanti, Yusra	Hydrotherapy of Blood	D = Quasi experimen	There is a significant effect

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	and Budiani, 2021	Glucose Level at Time for Diabetes Mellitus (DM) Patient	With pre eksperimen one Group pretest - posttest. S = 34 sample V = Hydroterapi, DM I = Measuring blood sugar A = T - test	with the P-Value 0.000 < (0.05)
4	Saherna and Rezkiawan, 2020	The Effect Of Drinking Water On Hyperglycemia In Diabetes Mellitus	D = This Research Design, use design pre-experiment. by design static group technique comparison accidental sampling. S = 14 sample V = Hydroterapy drinking water,blood glucose level, diabetes melitus. I = Measuring blood sugar using tools measure glucometer A = Paired sample T-test	There is a significant effect with *P-Value* 0.021 < (0.05)
5	Jahidin, Fitriani and Wahab, 2019	The effect of drinking water therapy on decreasing blood sugar levels (GDS) in patients with type II diabetes mellitus	D = Experiment with approach One Group Pre-test and post test design. S = 20 sample V = Hydroterapy, DM type 2. I = Random Blood Sugar Measurement A = Repeated Anova	There is a significant effect with the P-Value 0.000 < (0.05)
6	Kusniawati and Suhanda, 2017	Hydrotherapy Can Lower Blood Sugar Levels When Patients with Type 2 Diabetes Mellitus at Cipondoh Community Health Centers Tangerang City	D = quasi experiment with Approach control group. Design with pretest and posttest S = 60 sample V = diabetes mellitus, blood sugar Level time, hydrotherapy. I =Lembar Observasi Pengukuran Gula Darah Sewaktu. A = T independent	There is a significant effect with the P-Value 0.000 < (0.05)
7	Pratiko, Rahmawati and Fitri, 2022	The influence OF A Combination Walking therapy and Hydrotherapy to decrease blood glucose levels in Patiens with diabetes mellitus type II.	D = Quasi Experimental with Pre-Post Test Grup Control. S = 32 sample V = Hydroterapi, DM type 2, Walking Therapy I = SOP for walking, SOP Hydrotherapy and glucose meter A= Wilcoxon & Mann Whitney	There is a significant effect with P-Value of 0.001 < (0.05)
8	Damayanti *et al.*, 2021	Effect of Benson's Hydrotherapy and Relaxation Blood Sugar Levels of Diabetes Mellitus Patiens	D = quasi eksperimen with pre-post control grup design. S = 40 sample. V= Hydrotherapy, DM type 2, Relaxation Benson. I = Data collection use pre-posttest and Sugar measurement blood. A = wilcoxon & *Mann Whitney*	There is no significant effect with the P-Value 0.554 > (0.05)
9	Sholiha, Sudiarto	The Combination of	D = Quasy Experiment with pre	There is a significant effect

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	and Setyonegoro, 2019	Walking Exercise and Hydrotherapy affects Blood Glucose Levels in Patients with Type II Diabetes Mellitus	and posttest by design control group. S = 48 sampel responden. V = Walking Exercise, Hydrotherapy, Blood Glucose Level I = Data collection use pre-posttest and Sugar measurement blood. A = *Independent t-test*	with the P-Value 0.00 < (0.05)
10	Siswantoro and Purwanto, 2017	Effectiveness of Alkali Water Consumption to Reduce Blood Sugar Levels in Diabetes Mellitus Type 2	D = Quasy Experiment with pre and post test by design control group. S = 28 sample V = Walking Exercise, Hydrotherapy, Blood Glucose Level I = Data collection use pre-post test and Sugar measurement blood. A = One Way Anova Tes	There is a significant effect with P-Value 0.039 < (0.05)

DISCUSSION

Based on 10 journals that have been reviewed, there are 9 journals with the results that there is an effect of Hydrotherapy on reducing blood sugar levels in patients with diabetes mellitus with a significant P-Value <0.05 and 1 journal with the result that there is no effect of Hydrotherapy on reducing blood sugar levels in diabetic patients. mellitus with a significant P Value > 0.05.

According to research conducted by Hadinata (2022), the effect before and after Hydrotherapy with an average of 509 mg/dl to 271 mg/dl. According to the assumption of researchers that Hydrotherapy can help the process of removing toxins in the body including excessive blood sugar levels by drinking water can reduce blood sugar levels.

According to research conducted by Tarigan (2021), there is a significant effect with the P-Value 0.00 < (P Value 0.05), with a decrease from 274.09 mg/dl to 251.18 mg/dl. According to the researcher's assumption that water acts as an intermediary for disposal, substances that are not good will come out through the urine, including high blood sugar levels, due to the breakdown of sugar.

According to research conducted by Siswanti, Yusra and Budiani (2021) there is a significant effect with P-Value 0.00 < (P Value 0.05). The decrease occurred from 178.77 mg/dl to 157.59 mg/dl. According to the researcher's assumption that adjusting the intake of water, diet and minerals will restore the state and high blood sugar levels in the blood will be resolved.

According to research conducted by Saherna and Rezkiawan (2020) there is a significant effect with a P-Value of 0.001 < (P-Value 0.05). The average decrease occurred from 282.57 mg/dl to 139.71 mg/dl. According to the researcher's assumption that drinking enough water according to the body's

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compensation limit, this is proven to be able to help the process of how the kidneys work in filtering the dietary fiber needs that the body needs so that it is properly distributed according to cell needs and can be metabolized optimally by the body.

According to research conducted by Jahidin, Fitriani and Wahab (2019), it was found that there was a significant effect with a P-Value of 0.000 < (0.05). The average decrease in GDS occurred from 230.15 mg/dl to 166.10 mg/dl on the seventh day and decreased again to 136.25 mg/dl on the fourteenth day. According to the researcher's assumption consuming large amounts of water in the morning after waking up is good. Because in this condition the stomach is empty that the stomach wall can absorb water quickly, then it is rushed into the blood, then flowed by the blood to the kidneys and excreted through the urine.

According to research conducted by Kusniawati and Suhanda (2017), it was found that there was a significant effect with a P-Value of 0.000 < (0.05). The decrease in the average GDS occurred from 296.57 mg / dl to 221.17 mg / etc. According to the assumption of researchers that consuming water can help get rid of toxic substances in the body, including excess sugar that occurs due to the process of breaking down sugar through the kidneys, large amounts of fluids are needed in one administration, especially in the Morning.

According to research conducted by Pratiko, Rahmawati and Fitri (2022) it was found that there was a significant effect with a P-Value of 0.001 < (0.05). The average decrease of 16 respondents from the hyperglycemia category (201 mg / dl-250 mg / dl) 11 respondents to the euglycemia category (101 mg / dl-200 mg / dl), According to the researcher's assumption that drinking hydrotherapy water is useful for preventing dehydration when do physical exercise, so that walking therapy and water hydrotherapy can reduce the increase in blood sugar levels in people with type 2 diabetes.

According to research conducted by Damayanti *et al.* (2021) it was found that there was no significant effect with the P-Value of 0.554 > (0.05) with data on the average blood sugar value of 184.59 mg/dl to 162.94 mg/dl alone during the 5-day intervention. According to the researcher's assumption that due to the Covid-19 pandemic conditions, which caused the research team's limitations to often meet with respondents for a longer period of time, the researcher's limitations in controlling other external variables in the form of controlling Dietary patterns in respondents became the most dominant factor affecting blood sugar levels because there is a lot of education related to nutrition as the body's immune system in fighting COVID-19 so that researchers can't control it related to diet patterns.

According to research conducted by Sholiha, Sudiarto and Setyonegoro (2019), it was found that there was a significant effect with a P-Value of 0.000 < (0.05). The average decrease in blood sugar occurred from 220.29 mg / dl to 215.17 mg/dl. According to the researcher's assumption that because in this condition the stomach is empty so that the stomach wall can absorb water more quickly. The water flows

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into the blood to dilute the buildup of sugar levels. The blood will send water to the kidneys, which will be absorbed and excreted. to get rid of excess substances that will be excreted in the urine. In addition, adjusting the intake of water and minerals can control the situation and high blood sugar levels resulting in a decrease in blood sugar levels.

According to research conducted by Siswantoro and Purwanto (2017), it was found that there was a significant effect with a P-Value of 0.039 < (0.05) The decrease in average blood sugar occurred from 220.29 mg / dl to 215, 17 mg/dl. According to the researcher's assumption that alkaline water is the type of water that contains antioxidants (PH 9.5 and 11.5) needed by the body with a detox system to remove toxins and hyperglycemic free radicals through frequent urination. Alkaline water also stimulates to improve the work function of the body's organs related to the improvement of the immune system and the function of the pancreas in producing insulin so that it can lower blood sugar in the body.

CONCLUSION

Nine Journals (90%) There is an effect of giving hydrotherapy (drinking water) on reducing blood sugar levels in patients with diabetes mellitus P Value which is significant < 0.05 and 1 Journal (1%) there is no effect of giving hydrotherapy (drinking water) on decreasing blood sugar levels. blood sugar in patients with diabetes mellitus P Value > 0.05.

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