

## **The Effect of Classical Music Therapy on Reducing Blood Sugar Levels in Wounded Patients with Foot Type Diabetes II in the Beautiful Wound Care Center Medan**

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### **ABSTRACT**

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Diabetes Mellitus (DM) is a chronic metabolic disorder caused by the insulin hormone in the body that cannot be used effectively in regulating blood sugar balance, thereby increasing the concentration of sugar levels in the blood (hyperglycemia). Classical music therapy that provides a relaxing effect so that it can lower blood sugar levels. The purpose of this study was to identify the effect of classical music therapy on reducing blood sugar levels in patients with type 2 diabetes foot ulcers at Asri Wound Care Center Medan. This study uses a Quasy experimental research method, with a Pretest – Posttest Control Group Design, this research was conducted at Asri Wound Care Center Medan. The sample in this study was 40 respondents using the purposive sampling technique, the measuring instrument used was the Glucometer Easy Touch Glucose, Cholesterol, Uric Acid (GCU). The results of the Independent T - Test show that the P - Value is 0.000 because the P - Value is smaller than 0.05, it can be concluded that the classical music therapy method has a significant effect on reducing blood sugar levels. This can be proven by looking at the pretest and posttest which has shown a significant increase. this research can be expected to be useful information to improve the quality of education.

**Keywords:** Blood Sugar levels, Music Therapy, Type II Diabetes Mellitus

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## **1. INTRODUCTION**

Diabetes is the most common chronic disease in Europe. According to the [28] Year 2021, in the European Region, it is estimated that 64 million people mature in 25 years and around 300,000 children and teenagers live with diabetes. Levels between men and women are similar. Region Europe has the highest burden of type 1 diabetes globally, and half of all adults with type 2 diabetes are not diagnosed. By 2045, one in every ten people in Europe will have diabetes, as the population ages and obesity levels rise.

Based on data from the IDF ( *International Diabetes Federation*), kindly global, more than one in 10 people are now living with diabetes. In addition, there is a list of growing countries where one in five or even more of the population has diabetes. The estimated prevalence of diabetes in adults aged 20–79 years has more than tripled, from about 151 million (4.6% of the global population) to 537 million (10.5%) today. Without enough action to overcome this situation, we estimate that 643 million people will have diabetes in 2030 (11.3% of the population). If the trend continues, the numbers will soar to 783 million (12.2%) in 2045 [9].

The high prevalence in sufferers of type 2 diabetes mellitus is caused by a number of factors, such as vulnerability, genetics, and exposure to the environment. Physical activity can also be a risk factor for diabetes mellitus. Regular physical exercise can improve the quality of blood vessels

and improve all aspects of metabolism, including increasing insulin sensitivity as well as improving blood glucose tolerance [7].

Sufferers of diabetes mellitus are at risk of experiencing complications, namely, foot wounds in diabetic foot wounds, complications that diabetics fear because they can result in amputation. The pathophysiology of wounds in diabetes is complex and involves multiple factors, among them neuropathy, sensory impairment, and peripheral arterial disease (angiopathy). deformity foot and traumatized external. Peripheral neuropathy is the reason for the most diabetic foot wounds. Damage to the sensory nerves is caused in the sufferer not realizing that his leg was hit by a sharp object, while damage to the autonomic nerves is caused in sweat glands. And the oil becomes disturbed, resulting in feet becoming dry and cracked. The long-term can result in bacteria entering the skin and causing infection, damaging nerves and motor functions, resulting in a change in the shape of the foot and a change in the point of the foot, so that long will form a callus or calluses thick on the legs. Callus that is thick if thinned out long will experience inflammation (Sari, 2015).

Patients with diabetes mellitus are frequently exposed to stressful situations. Stress can cause an increase in the hormone adrenaline, which can cause an increase in the rate of sugar in the blood. The higher the level of stress, the higher the rate of blood sugar. So, if a diabetic patient experiences stress, it can have an impact on the patient's health [11].

Giving therapy music Can improve mood and lower production of endorphins by the body can cause patients to feel more relaxed. As a result, the body's metabolic activity also decreases, making the expected blood glucose levels in the body more stable [18].

Music is provided to cure disease, but is that disease physique or psychic with the use of certain sounds or rhythms? Classical music, orchestral music, and other modern music are examples of music used in therapy [12].

Classical music recently This was introduced and popularized after lots of studies that discussed and studied more about the positive influence of classical music on a good life for health or also its role in learning. Music classics like Mozart, Bach, Beethoven and Vivaldi can improve memory skills, reduce stress, relieve tension, increase energy and increase memory [2].

Results Study: [27] There is a result of the *Wilcoxon signed rank test* on group music natural day one to day seven obtained the value of  $p\text{ value} = 0.000$ , which means there is an influence of natural music therapy to change the rate of sugar in the blood on sufferers of diabetes mellitus type II in the region of Prambanan Klaten in 2019 year.

Results Study [25] found that the average blood sugar level prior to music therapy was 286, and after he did therapy, the average blood sugar rate became 234.96. So the test is carried out *as a T- dependent test (paired)*, and the average difference in rate of sugar in blood is 51.25 with a standard deviation of 24.323. And standard error: the mean is 4.965 with *a p-value of 0.000*. Mark  $p < 0.05$  so that we can conclude that there is a change.

The mechanism of music therapy is that when you listen to music, it will increase immunoglobulin A, which reduces the production of the hormone cortisol, which causes stress, so that can reduce worry [2].

Sound stimulation will increase the release of endorphins, which will cause relaxation. So that rate is cortisol, epinephrine, norepinephrine, and dopamine. And hormones growth in serum will experience a decline. Where the rate of breathing slows down, thinking becomes more calm, emotions are controlled, and metabolism improves. Metabolism, which has a higher generated rate of glucose in the blood, can decrease [18]

Based on the results of initial observations that were made by researchers in the beautiful *Wound Care Center Medan*, they obtained data on 2021 patients who experienced the disease Diabetes Mellitus by as much as 204. And in the results of the interview, which was done with a 7 -person sufferer of DM in the beautiful *Wound Care Center Medan*, they said he did not know about therapy with classical music, and he had never done classical music therapy to reduce blood sugar levels. Based on the background behind it, researchers are interested in researching the

influence of classical music on decreased blood sugar levels in patients with type 2 diabetic foot sores at the Asri Wound Care Medan Center .

## 2. METHODS

Study method Which type of study is used? *Quasy Experiment*, where research is tested by trying something intervention on a bunch of subjects with or without group comparison. With the *pretest-posttest control group design* that is in the design of this study was shared in a manner of randomness into two or more groups. One group is the intervention group, while the other group is a control group as a comparison [15]. The measuring tool which was used in this research is *an easy-touch glucometer for glucose, cholesterol, and uric acid (GCU)* .

## 3. RESULTS AND DISCUSSIONS

**Table 1.** Characteristics Respondents

No.	Characteristics Respondents	F	%
1.	age		
	a. 40 - 59 Years	30	75.0
	b. 60 - 74 Years	10	25.0
	<b>Total</b>	<b>40</b>	<b>100</b>
2.	Gender		
	a. Male	21	52.5
	b. Female	19	47.5
	<b>Total</b>	<b>40</b>	<b>100</b>
3.	Education		
	a. Elementary school	7	17.5
	b. Junior high school	7	17.5
	c. Senior High School	8	20.0
	d. College	18	45.0
	<b>Total</b>	<b>40</b>	<b>100</b>
4.	Long Suffering DM		
	a. 1 year	3	7.5
	b. 2 year	8	20.0
	c. 3 year	4	10.0
	d. 4 year	5	12.0
	e. $\geq 5$ Years	20	45.0
	<b>Total</b>	<b>40</b>	<b>100</b>
5.	Family History		
	a. There is	39	97.5
	b. There isn't any	1	2.5
	<b>Total</b>	<b>40</b>	<b>100</b>

According to the table above, it is known that part of the population is more vulnerable between the ages of 40 and 59 (75.0%), with 30 respondents (75.0%), and part is more vulnerable between the ages of 60 and 74 ( 25.0%). The largest respondent male sex is known to be as many as 21 people (52.5%). And the small part of the respondent is manifold sex woman as much as 19 people (47.5%) The majority of respondents (18) have a university education (45.0%), and a small number of respondents (7.5%) have an SD or middle school education. Part of the big respondent population has long suffered from DM, that is, 5 years, as many as 20 respondents (50.0%), and

some small number of respondents have suffered from DM for 1 year, as many as 3 respondents (7.5% ). And as many as 39 respondents (97.5%) have a history of diabetes in their family.

**Table 2.** Distribution frequency Results *Pretest* Group treatment

Blood Sugar Levels	F	%
currently	3	15.0%
tall	17	85.0%
Total	20	100.0%

Based on this table, it is explained that to obtain criteria of moderate value, there are 3 patients (15.0%) whose own rate of sugar in the blood is still limited to normal. Among patients who scored high, there are 17 patients (85.0%), which means their own blood sugar is high.

**Table 3.** Frequency Distribution of Group *Pretest Results* Non - Treatment

Blood Sugar Levels	F	%
currently	9	45.0%
tall	11	55.0%
Total	20	100.0%

Based on the table above it can be explained that who obtains criteria marks currently there were 9 patients (45.0%) which means patients it has blood sugar levels that are still limited normal. Though patient which obtain marks tall there is 11 patient (55.0%) which means the patient has blood sugar levels which tall.

**Table 4.** Frequency Distribution of Group *Posttest Results* Treatment Day 1, 2 & 3

Rate Sugar Blood Day 1	F	%
Currently	8	40.0%
Tall	12	60.0%
Total	20	100.0%
Rate Sugar Blood DayTo-2	F	%
currently	15	75.0%
tall	5	25.0%
Total	20	100.0%
Rate Sugar Blood Day to - 3	F	%
Low Currently	2	10.0%
tall	15	75.0%
	3	15.0%
Total	20	100.0%

Based on table in on canexplained that on day 1 which obtained moderate values there were 8 patients which means the patient has levels sugar blood which still limited normal. Though patient which obtain marks high there are 12 patients, which means patients the own rates sugar blood which tall.

On day To - 2 can explained that which obtain marks currently there is 15 patient which it means patient the own rates sugar blood which still limited to normal. Meanwhile, patients who obtain marks tall there is 5 patient which means the patient has levels sugar blood which tall.

Though on day to – 3 can explained that which obtain marks low there are 2 patients which means patients have low blood sugar levels normally, there were 15 patients in the moderate category which means the patient has levels sugar blood which still limited normal. Though patient which obtain marks high there are 3 patients, which means patients the own rates sugar blood which tall.

**Table 5.** Distributions frequency Results *Posttest* Group Non - Treatment day 1,2 & 3

<b>Rate Sugar Blood Day 1</b>	<b>F</b>	<b>%</b>
Currently	9	45.0%
Tall	11	55.0%
<b>Total</b>	<b>20</b>	<b>100.0%</b>
<b>Rate Sugar Blood Day To - 2</b>	<b>F</b>	<b>%</b>
Currently	10	50.0%
Tall	10	50.0%
<b>Total</b>	<b>20</b>	<b>100.0%</b>
<b>Rate Sugar Blood Day To - 3</b>	<b>F</b>	<b>%</b>
Currently	11	55.0%
Tall	9	45.0%
<b>Total</b>	<b>20</b>	<b>100.0%</b>

Based on table 4.5 in on can explained that on day 1 the non-treatment which obtain marks currently there is 9 patient which it means patient the own rates sugar blood which still limited to normal. Meanwhile, patients who obtained a high score there were 11 patients which means the patient has levels sugar blood which tall. On day to – 2 can explained that which obtain marks currently there is 10 patient which it means patient the own rates sugar blood which still limited to normal. Meanwhile, patients who obtained a high score there were 10 patients which means the patient has levels sugar blood which tall.

While on day 3 the group non treatment can be explained that which obtained moderate values there were 11 patients which means the patient has levels sugar blood which still limited normal. Though patient which obtain marks high there are 9 patients, which means patients the own rates sugar blood which tall.

### Bivariate Analysis

**Table 6.** The Influence of Classical Music Therapy Against decline Rate Sugar Blood On Diabetic Foot Wound Patient Type 2 DM Di beautiful *WoundCare Center Medan* Group treatment

	<b>Means</b>	<b>F</b>	<b>Sig.</b>	<b>Df</b>	<b>Sig.( 2-tailed)</b>
<b>Pretest x Posttest 1 (Day to 1)</b>	0.250	13.34 5	0.001	38	0.080
<b>Pretest x Posttest 2 (Day to 2)</b>	0.600	2,502	0.122	38	0.000
<b>Pretest x Posttest 3 (Day to 3)</b>	0.800	0.075	0.786	38	0.000

Based on results test *Independent Q Test* in the table above on day 1 of the study can concluded that marks average decline rates sugar blood after done therapy music classic is as big

0.250 with Sig 0.001 And marks Sig.( 2- tailed) or *P – Value* = 0.080 ( $\geq 0.05$ ). Results the show that No There is influences therapy music classic to decline rates sugar blood on patient diabetic

foot wound type 2 DM in Asri *Wound Care Medan Center*.

On day to 2 study can it was concluded that the average value decreased rates sugar blood after done therapy music classic is as big 0.600 with Sig 0.122 and value of Sig.(2-tailed) or *P – Value* = 0.000 ( $\leq 0.05$ ). Results the show that there is influence therapy music classic to decline rates sugar blood on patient diabetic foot wound type 2 DM in Asri *Wound Care Medan Center* .

**Table 7.** Influences Therapy Music Classic to Decreased Blood Sugar Levels Inpatient Wound Foot Diabetes DM type 2 in Asri *Wound Care Center Medan Non-Treatment Group*

	Means	F	Sig.	Df	Sig.( 2-tailed)
Pretest x Posttest 1 (Day to 1)	0.000	0.000	1,000	38	1,000
Pretest x Posttest 2 (Day to 2)	0.050	0.192	0.664	38	0.759
Pretest x Posttest 3 (Day to 3)	0.000	0.000	1,000	38	0.539

influence therapy music classic to decline rates sugar blood on patient wounds feet diabetes DM type 2 in beautiful *Wound Care Center Medan*.

While on the 3rd day of the study can concluded that marks averaged decline rates sugar blood after performed classical music therapy is equal to 0.800 with Sig 0.786 And marks Sig.( 2- tailed) or *P – Value* = 0.000 ( $\leq 0.05$ ). Results the show that there is Based on the results of the Independent T Test - *Test* in the table above on day 1 of the study can concluded that marks averaged decline rates sugar blood after done therapy music classic is as big

0.000 with Sig 1,000 And marks Sig.( 2- tailed) or *P – Value* = 1.000 ( $\geq 0.05$ ). Results the show that No There is influences therapy music classic to decline rates sugar blood on patient diabetic foot wound type 2 DM in Asri *Wound Care Medan Center* .

On day 2 study can it was concluded that the average value decreased rates sugar blood after done therapy music classic is as big 0.050 with Sig 0.664 and value of Sig.(2-tailed) or *P – Value* = 1,759 ( $\geq 0.05$ ). Results the show that No There is influences therapy music classic to decline rates sugar blood on patient wounds feet diabetes DM type 2 in beautiful *Wound Care Center Medan*.

On day 3 study can it was concluded that the average value decreased rates sugar blood after done music therapy classic is as big 0.000 with Sig 1,000 and value of Sig.(2-tailed) or *P – Value* = 0.539 ( $\geq 0.05$ ). Results the show that No There is influences therapy music classic to decline rates sugar blood on patient wounds feet diabetes DM type 2 in beautiful *Wound Care Center Medan*.

## Discussion

Based on the results from the study of sheet observation before classical music therapy was carried out on group treatment, the criteria were obtained, which had a moderate blood sugar rate as many as 3 people (15.0%), which means that the sugar rate is still within the normal limit, which is 170-250 mg/dl, while those who have content criteria have a high blood sugar rate as much as 17 people (85.0%). which means the rate of sugar has exceeded the normal or usual limit in call with a high blood sugar rate that is 250 mg/dL.

Whereas in the non-treatment group, which meets the criteria of moderate value, there are nine patients, which means the patient has blood sugar levels that are still within normal limits. Whereas patients who obtain a high mark there are 11 patients, which means patients' own rate of sugar in their blood is tall. This matter is because a large proportion of people over the age of 45 (87.5%) begin to experience glucose intolerance. Theory: This is supported by theory, which states that intolerance rates of sugar in blood in elderly people are due to advancing with age, there is a

decrease in insulin secretion and resistance to insulin. experts They also argue that people over 45 will experience a risk of enhancement of the blood sugar along with aging [23].

Blood sugar rate enhancement can be accompanied by aging and also present a number of Which causes the patient's blood sugar rate is high. Respondents who came to the beautiful *Wound Care Center Medan* have an average age of over 45 years, and most of them eat food that can trigger high blood sugar levels, so patients often have high blood sugar levels. In line with research conducted by Idris (2020), which proves that patients with DM type 2 whose own intake of carbohydrates is not enough to meet their needs tend to be unable to exercise control over their blood sugar levels compared to patients with appropriate carbohydrate intake needs, The amount of carbohydrate consumed from food is more important than the source of carbohydrate. This caused the amount of carbohydrate consumed from food main and intermezzo to affect blood sugar levels and secretion of insulin.

And also, most respondents experience stress because of a wound that has not healed yet. This is in line with the research conducted by [25], which states that stress causes excess production of cortisol. Cortisol is a hormone that opposes insulin and causes high blood sugar levels. Cortisol is an enemy of insulin, so it makes it more difficult for glucose to enter cells and increases blood sugar. The relationship between stress and enhancement rate of sugar in the blood depends on the circumstances under which stress will occur and enhancement hormones (stress hormone epinephrine and cortisol).

Giving music therapy Can improve mood and lower the production of endorphins by the body, which can cause patients to feel more relaxed. As a result, the body's metabolic activity also decreases, making the expected blood glucose levels in the body more stable [18]. Music is provided to cure disease; is that disease physique or psychic with the use of certain sounds or rhythms? Classical music, orchestral music, and other modern music are examples of music used in therapy (Farida, 2018).

Classical music recently This was introduced and popularized after lots of studies that discussed and studied more about the positive influence of classical music on a good life for health or also its role in learning. Classical music like Mozart, Bach, Beethoven, and Vivaldi can improve memory skills. reduce stress, relieve tension, increase energy, and increase memory [2].

There are a number of respondents who did not experience change after doing classical music therapy. Because there are several respondents who do not like classical music, they feel uncomfortable when listening to classic music therapy. And there is also a respondent who, on day 1 of therapy, did not change the value of sugar content in the blood. And on the next day, the researcher does classical music therapy to the respondent with a tone of a number of which experience declines in marked blood sugar rates. This matter caused because the researcher gave classical music therapy with a title that was different from the one who gave it the day before because the respondent felt more comfortable with the classical music given by the researcher the next day.

According to the researchers' assumptions, the results of giving classical music therapy effect on lowering blood sugar levels so that the respondent who initially had high blood sugar levels and after being given classical music therapy the responder's blood sugar rate is better. While there was a small group of respondents who had already given classical music therapy experience due to increased blood sugar levels, respondents felt stress due to injuries suffered.

Besides responding to the stress of the wound that has not yet healed, the respondent also did not maintain a diet. Eating patterns can trigger an increase in blood sugar levels. The diet, particularly the consumption of carbohydrates, fats, proteins, and excessive glucose, can cause an increase in blood sugar levels.

#### **4. CONCLUSION**

Based on the results of the study about the influence of music therapy on declining blood sugar rates in patients with diabetic foot wound type 2 DM in *Asri Wound Care Center Medan*, it

can be concluded that the following blood sugar rate in the treatment group is still in the high category when observation begins (pretest). There are 17 respondents who have rated sugar tall. Meanwhile, in the control group, blood sugar was still in the tall category during the initial observation (pretest), there were 11 respondents who had a high sugar rate. Decline the rate of sugar in the blood in the beautiful *Wound Care Center Medan* after being given treatment with the use of classical music therapy method experience influence Which is significant. there are 15 patients in the category currently And patients Which obtain mark tall there are 3. Whereas in the control group Which No given method of classical music therapy No experience change. There are currently 3 categories of people, which means and which has the criteria for a blood sugar rate as high as 17 respondents . Results Test *Independent Q - test results showt the value of P - Value is 0.000 because of influence, which is P - Value is 1* There are currently 15 patients in this category, with three of them receiving a tall mark. *n blood sugar levels*. Matter can be proven by the views of the pretest and posttest which have shown an increase, which is significant.

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