

The Effect of Decoction of Moringa Leaves (*Moringa Oleifera*) on Blood Sugar Levels in Type II Diabetes Mellitus Patients

Siska Sakti Angraini^{1*}, Ibrahim Ibrahim², Fanny Jesica³, Ramah Hayu⁴

^{1,2,3,4} Nursing Department, STIKES Syedza Saintika Padang

*Corresponding author. Email: siska.sakti321@gmail.com

ABSTRACT

Diabetes Mellitus (DM) is a gathering of metabolic sicknesses described by hyperglycemia that happens because of deformities in insulin discharge, insulin action or both. One of the actions to treat diabetes mellitus non-pharmacologically is by a decoction of Moringa leaves. This review means to decide the impact of bubbled Moringa leaves on glucose levels in patients with type II diabetes mellitus. The plan of this exploration is Quasi Experiment with Two Group Pretest Posttest Design. The samples were 16 patients with Type II DM which were divided into 8 people in the intervention group and 8 people in the control group. The intervention group checked blood glucose levels every day before and after being given Moringa leaf decoction. the intervention group was given a dose of Moringa leaf decoction once a day for 7 days. The control group checked blood sugar levels every day. After 7 days, the glucose levels in both groups were measured and the average glucose levels were compared between the two groups. Data analysis using independent t-test. The results of the t-test statistical test in the intervention group with $p = 0.000$ ($p < 0.05$) mean that there is a significant effect on the results of blood sugar levels in the intervention group. The conclusion is that there is an effect of boiled Moringa leaves (*Moringa oleifera*) on glucose levels in patients with type II diabetes mellitus. It is hoped that the results of this study will become input for the Andalas Padang Health Center in providing non-pharmacological therapy of Moringa leaf decoction to diminish glucose levels in patients with type II diabetes mellitus.

Keywords: *Diabetes Mellitus, Moringa oleifera, blood sugar levels*

1. INTRODUCTION

The number of people with Type II DM worldwide is 415 million people and it is predicted that by 2040 the prevalence of DM will be 642 million people. In 2017, the incidence of Type II Diabetes Mellitus was more experienced by men with the number of sufferers being 215.2 million people and it will continue to increase in 2040 which is predicted to be 328.4 million people. Meanwhile, for women, the incidence of Type II DM in 2017 was 199.5 million people and will continue to increase in 2040 to 313.3 million people. One in two diabetics is estimated to be undiagnosed with Type II DM, this causes the death rate due to Type II DM to increase by 5 million in 2015 [1].

According to the World Health Organization (WHO) in 2016, said that in Indonesia Type II DM was ranked 5th of the total deaths from non-communicable diseases. WHO estimates (2016)

7.0% of the population in Indonesia has Type I DM [2]. The results of the Basic Health Research (Riskesdas) in 2018, the proportion of the population 15 years with Type II DM is 8.5% [3].

The prevalence of Type II DM patients based on interviews was found to have been diagnosed and had symptoms increased from 1.1% in 2013 to 2.1% in 2018. The proportion of the population aged 15 years with Impaired Glucose Tolerance (TGT) reached 29.9% . This means that more and more people are at high risk of suffering from Type II DM. national prevalence, 2018 West Sumatra was positioned 21 out of 34 regions in Indonesia. In view old enough, numerous victims are in the age range of 55-64 years with a prevalence of 6.3%[3]. Preliminary data obtained from the Padang City Health Office DM disease ranks 6th and Andalas Health Center ranks first with the most DM cases.

The executives of DM patients should be possible with pharmacological and non-pharmacological treatments. Pharmacological administration can be in the form of oral antihyperglycemic drugs and insulin. While non-pharmacological management can be done utilizing normal fixings got from plants, for example, soursop leaves, seri leaves, betel leaves, moringa leaves and bay leaves [4].

Moringa leaves (*Moringa Oleifera*) have antihyperglycemic activity by inhibiting the -glucosidase enzyme found in the small intestine. Inhibition of the -glucosidase enzyme causes a decrease in the rate of digestion of carbohydrates into monosaccharides that can be absorbed by the small intestine, thereby reducing hyperglycemia. The reduction in hyperglycemia contributes to a decrease in hemoglobin A1C levels in diabetic patients which also reduces the risk of vascular complications [5].

Research Syamra reported that Moringa leaves contain vitamin C which functions to produce and regulate the hormone insulin, as well as vitamin E to prevent Diabetes Mellitus. The effect of giving Moringa leaf stew on glucose levels in patients with Type II Diabetes Mellitus in the Bengkinang Kota sub-district showed that there was an impact of giving Moringa leaf stew on reducing blood sugar levels with a P-Value of 0.000.[6], [7].

In the initial survey that the researchers conducted on December 20, 2019, by interviewing 10 Type II DM patients who visited the Andalas Padang Health Center Work Area, it was found that 6 DM patients did not know the benefits and uses of Moringa leaf stew for lowering blood sugar levels, which they knew if their blood sugar rises they take medicine and 4 people know about Moringa leaf stew but because it tastes bitter they rarely drink Moringa leaf stew to lower their blood sugar levels, so Type II DM patients routinely consume diabetes pharmacological drugs every day. Type II who visited the Andalas Padang Health Center Work Area, it was found that 6 DM patients did not know the benefits and uses of Moringa leaf stew for lowering blood sugar levels, they knew that if their blood sugar rose they took medicine and 4 people knew about Moringa leaf stew. but because it tastes bitter they rarely drink boiled Moringa leaves to lower their blood sugar levels, so Type II DM patients routinely consume diabetes pharmacological drugs every day. Based on this, the researchers wanted to know the effect of Moringa leaf stew on glucose levels of patients with type II diabetes mellitus in the Andalas Padang Health Center Work Area.

2. MATERIALS AND METHODS

This research uses the Quasy Experiment Design method with Two Group Pretest Posttest Design. The populace in this review was Type II DM patients who routinely carried out monthly routine checks, in 2019, totalling 123 people in the Andalas village with a sample of 16 people who were determined using a purposive testing strategy. The consideration rules in this review were type II DM patients, blood glucose levels when >200 mg/dl, willingness to be given Moringa leaf decoction 1 time and patients taking medication. The review was directed in the Andalas Padang Health Center workspace on 31 August-13 September 2020. The information in this review were gathered essential and optional which were obtained directly or from the data from the research site using observation sheets and glucose tests as a tool to measure glucose levels previously, then after the fact being given a decoction of Moringa leaves. Respondents drank a decoction of Moringa leaves as recommended by the researcher, given once a day for 7 days as much as 250 ml at a time. Provision of boiled water Moringa leaves is drunk in the morning (08.00). Data were analyzed using an independent t-test.

3. RESULTS

The results of this study discuss the univariate Analysis

Normal Glucose Levels in The Intercession Bunch

Table 1 Normal Glucose Levels in The Intercession Bunch in Type II Diabetes Mellitus Patients

Variable	Mean	SD	Min-Maks
Intervention Group	243,88	32,870	192-290

In light of table 1, the normal glucose level of the mediation respondents (post-test) was 243.88 mg/dL with a standard deviation of 32.870 mg/dL and the base glucose level was 192 mg/dL and the most extreme glucose level was 290 mg/dL.

Normal Glucose Levels in Control Group

Table 2. Normal Glucose Levels in the Control Group in Type II Diabetes Mellitus Patients

Variabel	Mean	SD	Min-Maks
Control Group	308,00	78,181	208-401

In light of table 2, the normal glucose level of control respondents (post-test) was 308.00 mg/dL with a standard deviation of 78.181 mg/dL and a

base glucose level of 208 mg/dL and a greatest glucose level of 401 mg/dL

Bivariate Analysis

The effect of boiled Moringa leaves on blood sugar levels

Table 3. Effect of Decoction of Moringa Leaves (Moringa Oleifera) on Blood Sugar Levels in Type II Diabetes Mellitus Patients

		F	df	p-value
Blood Sugar Level Results	Equal Variances Assumed	25,194	14	0,000

In view of table 3, the aftereffects of factual tests utilizing the autonomous t-test were gotten, the p-esteem = 0.000 ($p < 0.05$), then, at that point there was a huge contrast between the consequences of glucose levels in the intercession bunch, which implies that there is an impact of bubbled Moringa leaves and a reduction in glucose.

4. DISCUSSION

4.1 Blood Sugar Levels in the Intervention Group of Type II Diabetes Mellitus Patients

In light of table 1, shows the mean or normal glucose level. In the mediation bunch subsequent to being given treatment, the normal glucose level was 243.88 mg/dL with a standard deviation of 32.870 mg/dL. The least glucose level was 192 mg/dL and the most noteworthy was 290 mg/dL.

The aftereffects of the review are by Yenny Safitri's examination (2017) with the title of exploration on the impact of giving Moringa leaf stew on glucose levels in patients with type II diabetes mellitus, the normal worth of glucose levels is 71.41 mg/dL.

According to Adisakwatna (2011), DM treatment can be accompanied by herbs that have the potential to improve hyperglycemia, one of which is Moringa Leaf (Moringa Oleifera) which has antihyperglycemic activity by inhibiting the -glucosidase enzyme found in the small intestine. Inhibition of the -glucosidase enzyme causes a decrease in the rate of digestion of carbohydrates into monosaccharides that can be absorbed by the small intestine, thereby reducing hyperglycemia.

Analysts expected that glucose levels in the intercession bunch were demonstrated to have diminished where the normal glucose prior to burning-through Moringa leaf stew was 279.88 mg/dl after respondents burned-through Moringa leaf stew for 7 days diminished by a normal of 243.88 mg/dl. This is because of the presence of

flavonoid intensifies that can bring down glucose levels.

4.2 Blood Sugar Levels in the Control Group of Type II Diabetes Mellitus Patients

In light of table 2, shows the mean or normal glucose level. In the benchmark group (without Moringa leaf decoction), the normal glucose level was 308.00 mg/dL with a standard deviation of 78.181 mg/dL. The least glucose level was 208 mg/dL and the most noteworthy was 408 mg/dL.

This study is in line with research regarding the effect of giving Moringa leaf stew (Moringa Oleifera) on changes in blood glucose levels in the elderly with type II diabetes mellitus in the working area of Tanjung Karang Public Health Center, it was found that blood sugar levels in 8 respondents who were not given Moringa leaf stew for 8 days, 4 respondents experienced a decrease in blood sugar levels, 3 respondents experienced an increase in blood sugar levels and 1 respondent did not experience a decrease.[8]

Diabetes mellitus can also occur due to unhealthy eating patterns and lifestyles, such as intakes that contain high fat or have high levels of sweetness from sugar. High fat can make cells in the body insensitive to insulin. As a result, blood glucose levels rise above normal, because the body's cells cannot use insulin optimally. After all, it causes DM. In addition, gender also affects the occurrence of DM, this is because women are more prone to obesity than men, because women tend to not move, ignore carbohydrates and glucose.[9], [10]

As per Maulana, DM type II or considered DM that isn't reliant upon insulin is on the grounds that the current insulin can't work as expected, insulin levels can be typical, low or even expanded, yet the capacity of insulin for glucose digestion is missing/less. Accordingly, glucose in the blood stays high bringing about hyperglycemia, 75% of patients with type II diabetes are hefty or overweight and DM is normally known after the age of 30 years.[11]

The assumption of control group researchers is that blood sugar levels in hyperglycemic respondents have high blood sugar levels, this can be caused by lack of exercise and not regulating diet so that blood sugar levels are not controlled.

4.3 Effect of Moringa Leaf Decoction on Blood Sugar Levels in Type II Diabetes Mellitus Patients.

The aftereffects of measurable tests utilizing the Independent example t-test acquired a worth of $p = 0.000$ ($p < 0.05$), so there is an impact of bubbled Moringa leaves on glucose levels in patients with type II diabetes mellitus in the workspace of Andalas Padang Health Center.

The results of this study indicate that pharmacological management coupled with Moringa leaf decoction is more effective in lowering blood sugar levels. In the treatment group, the results showed a higher reduction compared to using only drugs.

Moringa leaves contain antioxidants such as flavonoids that help lower blood glucose levels. The flavonoids contained in Moringa leaves can work as insulin secretagogues or insulin-mimetics, which ultimately minimize diabetes complications and are very effective and safer in lowering blood sugar levels [12]. Non-pharmacological administration should be possible by changing eating routine, practice and burning-through natural fixings. While pharmacological administration can be as hostile to hyperglycemic medications and insulin, however these medicines have undesirable incidental effects like expanding in the fringe regions. This explanation has prompted the expanded public interest, particularly DM victims, in utilizing non-pharmacological treatment utilizing regular fixings got from plants, for example, Moringa leaves as an elective administration for controlling glucose levels.

The researcher's assumption on the consequences of the review was that the intervention group consumed 250cc of Moringa leaves in the form of a decoction for 7 days and taken 1 time a day, which is routinely every morning shown to affect blood sugar levels to decrease in hyperglycemic patients.

5. CONCLUSION

It is hoped that the results of this study will become input for the Andalas Padang Health Center in providing non-pharmacological therapy of Moringa leaf decoction to diminish glucose levels in patients with type II diabetes mellitus.

REFERENCES

- [1] A. M. Carracher, P. H. Marathe, and K. L. Close, "International diabetes federation 2017." Wiley Online Library, 2018.
- [2] G. Roglic, "WHO Global report on diabetes: A summary," *Int. J. Noncommunicable Dis.*, vol. 1, no. 1, p. 3, 2016.
- [3] K. K. RI, "Hasil utama riskesmas 2018," *Jakarta Kemenkes RI*, 2018.
- [4] E. Amzu, "kampung konservasi kelor: upaya mendukung gerakan nasional sadar gizi dan mengatasi malnutrisi di Indonesia," *Risal. Kebijak. Pertan. DAN Lingkung. Rumusan Kaji. Strateg. Bid. Pertan. dan Lingkung.*, vol. 1, no. 2, pp. 86–91, 2014.
- [5] S. Adisakwattana, O. Lerdsuwankij, U. Poputtachai, A. Minipun, and C. Suparpprom, "Inhibitory activity of cinnamon bark species and their combination effect with acarbose against intestinal α -glucosidase and pancreatic α -amylase," *Plant Foods Hum. Nutr.*, vol. 66, no. 2, pp. 143–148, 2011.
- [6] A. Syamra and A. Indrawati, "Pemberian Rebusan Daun Kelor Terhadap Penurunan Kadar Glukosa Darah Pada Pasien Penderita Diabetes Mellitus (Dm)," *J. Media Laboran*, vol. 8, no. 2, pp. 50–55, 2018.
- [7] Y. Safitri, "Pengaruh Pemberian Rebusan Daun Kelor Terhadap Kadar Gula Darah Pada Penderita DM Tipe 2 di Kelurahan Bangkinang Kota Wilayah Kerja Puskesmas Tahun 2017," *J. Ners*, vol. 2, no. 2, 2018.
- [8] E. Marvia, "Pengaruh Pemberian Rebusan Daun Kelor (Moringa Oleifera) Terhadap Perubahan Kadar Glukosa Darah Pada Lansia Penderita Diabetes Melitus Tipe II DI Wilayah Kerja Puskesmas Tanjung Karang," *PrimA J. Ilm. Ilmu Kesehat.*, vol. 3, no. 1, 2017.
- [9] N. H. K. Putri and M. A. Isfandiari, "Hubungan empat pilar pengendalian dm tipe 2 dengan rerata kadar gula darah," *J. Berk. Epidemiol.*, vol. 1, no. 2, pp. 234–243, 2013.
- [10] I. Siswandi, Y. Sofiani, and D. Irawati, "Efektivitas seduhan kayu manis (Cinnammon Burmanni) dan jahe merah (Zingiber Offcinale) terhadap penurunan GDS pada pasien DM tipe 2," *JHeS (Journal Heal. Stud.*, vol. 4, no. 1, pp. 54–65, 2020.
- [11] H. D. J. Maulana and S. Sos, "Promosi kesehatan," 2009.
- [12] D. Jaiswal, P. K. Rai, A. Kumar, S. Mehta, and G. Watal, "Effect of Moringa oleifera Lam. leaves aqueous extract therapy on hyperglycemic rats," *J. Ethnopharmacol.*, vol. 123, no. 3, pp. 392–396, 2009.