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Pengaruh Terapi Non Farmakologi*diabetes Melitus* Terhadap Kadar Gula Dalam Darah

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ABSTRACT
Background: Diabetes Mellitus is called the silent killer, because this disease causes various kinds of complaints and can attack all organs of the body. In Southeast Asia, people with Diabetes Mellitus in Indonesia are ranked 3rd with a prevalence of 11.3%. There are four pillars of diabetes mellitus control including physical activity, diet, pharmacological interventions, and education. Of the four pillars, physical activity is the most effective therapy to prevent blood sugar levels from remaining normal. Physical activities recommended for people with Diabetes Mellitus include walking, cycling, gymnastics and jogging. Purpose: The purpose of this literature review is to determine the effect of non-pharmacological diabetes mellitus therapy on blood sugar levels.Methode: In the search for data sources the article is carried out through the databases Google Scholar, Publish or Perish and Mendeley. Inclusion of study design using Literature Review. Results: The results of the literature review analysis there are 12 journals that ha stated or the alternative hypothesis is accepted. Conclusion: So it can be concluded that there is an influence of non-pharmacological therapy (diet and physical activity) diabetes mellitus on blood sugar levels. The effect of physical activity therapy on a decrease in blood sugar levels by 66.6%. And the effect of dietary therapy on reducing blood sugar levels by 33.3%.

Keywords: Physical Activity, Diabetes Mellitus, Diet, Sugar in the Blood, Therapy.

1. INTRODUCTION

Diabetes Mellitus (DM) is a chronic disease caused by the pancreas not being able to produce enough insulin which causes chronic complications. Symptoms complained of by diabetics include polydipsia, polyuria, weight loss, and tingling. Diabetes Mellitus is called the silent killer because this disease causes various kinds of complaints and can attack all organs of the body (Bhatt, Saklani & Upadhayay, 2016).

Data from a global study by the International Diabetes Federation (IDF) states that the prevalence of Diabetes Mellitus in the world is at least 463 million people aged 20-79 years. In 2019 the International Diabetes Federation (IDF) stated that the prevalence of diabetes was 9% in women and 9.65% in men. As the population ages, the prevalence of diabetes is estimated to increase to 19.9% or 111.2 million people aged 65-79 years. It is predicted that the number will continue to increase until it reaches 578 million in 2030, and in 2045 it is predicted to reach 700 million. Ranked first and second with the highest prevalence of diabetes in people aged 20-79 years among 7 regions in the world, namely countries in the Arab-North Africa region and the West Pacific, with rates reaching 12.2% and 11.4%. In the Southeast Asia region, Indonesia is ranked 3rd with a prevalence of 11.3%. Among 10 countries, Indonesia ranks 7th with the highest number of sufferers, reaching 10.7 million.

The prevalence of Diabetes Mellitus in Indonesia in 2018 was 6.3% in the 55-64 year age category and 65-74 year olds, namely 6.03%. Of the total population of type 2 Diabetes Mellitus cases with a prevalence of 8.6%, it is estimated that it will continue to increase in 2020 from 8.4 million people in 2000 to around 21.3 million people in 2030.

The prevalence of Diabetes Mellitus in West Java has increased from the previous year in 2017 reaching 1.3% and in 2018 to 1.7% (INFODATIN 2020). Based on the Non-Communicable Diseases Program (PTM) data report, the number of Diabetes Mellitus cases

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visiting the outpatient care of the Mundu Cirebon Public Health Center in West Java has decreased from the previous year in 2017 Diabetes Mellitus cases reached 10,605 cases, and in 2018 the number of Diabetes Mellitus cases was 9,534 . Then for areas of domicile where there are more diabetics, namely areas in urban areas as much as 1.9% compared to rural areas as much as 1.0% (KEMENKES RI, 2020).

The consensus of the Indonesian Endocrinology Association (PERKENI, 2015) says, there are 4 pillars of Diabetes Mellitus (DM) control including physical activity, diet therapy, pharmacological interventions and education (Type & Kota, 2017). Diet therapy is one of the successful management of diabetes. The diet therapy is based on the 3J, namely: amount, type and schedule. One of the factors to stabilize blood sugar levels to normal is adherence to this diet therapy (Herawati, Sa'pang & Harna, 2020b).

Diabetes Mellitus is a disease that cannot be cured, for this reason what sufferers can do is control and control so that they can maintain their quality of life. Pharmacological interventions in the form of oral blood glucose lowering (hyperglycemic) drugs and insulin therapy are the most effective controls used as pharmacological therapy. Therapeutic efforts carried out by people with Diabetes Mellitus are enthusiastic, but the longer the enthusiasm fades, some sufferers may not realize that their control is not as good as before. Obedient behavior to reduce the risk of developing health problems or exacerbating the illness is very important (Katuuk & Gannika, 2019).

Physical activity is movement produced by skeletal muscle contractions, the energy required exceeds energy expenditure during rest. The 2018 Basic Health Research said, in Indonesia the proportion of physical activity for the population aged ≥10 years was 66.5% in the sufficient category, and 33.5% in the insufficient category. Meanwhile in West Java, 62.5% is in the sufficient category and 37.5% is in the insufficient category.

Education is no less important than the three pillars above. The educational approach has the aim of providing information support in decision making, self-care behavior, problem solving, active collaboration with the health team to improve clinical outcomes, health status and quality of life (Herawati, Sa'pang & Harna, 2020).

At the Baptist Hospital, pre-research data were obtained for 10 Diabetes Mellitus sufferers using a questionnaire on April 10 2017, the results showed that as many as (70%) Diabetes Mellitus sufferers did not carry out the education that had been given by health workers, (60%) Diabetes Mellitus sufferers did not adhering to a diet that is in accordance with the application of medical nutrition management, (85%) people with Diabetes Mellitus do not exercise and (45%) people with Diabetes Mellitus do not routinely take drugs to lower blood sugar (Frequency et al., 2015).

Based on the above phenomena, the authors take the theme and title in this literature review in the form of "The Effect of Non-Pharmacological Therapy of Diabetes Mellitus on Blood Sugar Levels".

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2. METHODS

2.1 *Study Design*

In a study entitled effect of non-pharmacological therapy diabetes mellitus on blood sugar levels, systematic review method was used

2.2 *Setting*

The literature search in this literature review uses five databased with high and medium-quality criteria, Secondary data is the data used in conducting this research. Where the data obtained does not directly involve supervision, but takes data from previous research that has been carried out. The data sources used are e-Mendeley, Publish or Perish, Google books and Google Scholar databases in the form of articles or journals.

2.3 *Research Subject*

The outcome of the influence in the decrease in blood sugar levels is diet and physical activity for people with Diabetes Mellitus. In the most review methods in study design are Descriptive correlational using *a cross-sectional* approach, Pre-experimental with *One group pretest and posttest* design, *Quasi Experiment,*, Observational method with *retrospective study* design. The average number of respondents/participants as a whole is more than 50. With each study discussing Diet and Exercise as an Effort to Control Blood Sugar Levels in Diabetes Mellitus Patients, The Effect of Diabetes Mellitus Foot Gymnastics on Blood Sugar Levels of Diabetes Mellitus Sufferers, The Effectiveness of Diabetes Gymnastics on Blood Glucose Levels in People with Diabetes Mellitus, The Relationship of Physical Activity with Blood Glucose Levels While in *Diabetes Mellitus* Patients , Effect of High Calorie Diet on Increased Blood Sugar Levels in Patients with Diabetes Mellitus, Relationship of Diet and Physical Activity Patterns to Blood Sugar Levels While in Diabetes Mellitus Patients, Effect of Dietary Compliance, Physical Activity and Treatment of Changes in Blood Sugar Levels in Diabetes Mellitus Patients, Relationship of Dietary Adherence to Fasting Blood Sugar Levels in *Diabetes Mellitus* Patients. Inclusion data to determine the criteria for literature review materials, namely 1) The journal used is a journal related to the effect of Diabetes Mellitus therapy on reducing blood sugar levels, 2) Providing non-pharmacological therapy to people with *Diabetes Mellitus*, 3) There are comparative factors between non-pharmacological dietary therapy and physical activity therapy, 4) The influence of therapy on reducing blood sugar levels, 5) Correlational descriptive using *cross-sectional* approach Pre-experimental with *One group pretest and posttest* design, *Quasi Experiment, Observational*, method with *retrospective study* design, 6) 2012-2022, 7) Indonesian and English. As for the exclusion data: 1) In addition to journals related to the effect of Diabetes Mellitus therapy on the decrease in blood sugar levels., 2) In addition to the journal of giving therapy to people with Diabetes Mellitus, 3) In addition to the journal of giving therapy to people with *Diabetes Mellitus*, 4) There is no effect of therapy on reducing blood sugar levels, 5) In addition to descriptive correlational using a *cross-sectional approach* Pre-experimental with *One group pretest and posttest* design, *Quasi Experiment, Observational* method with *retrospective study* design, 6) years under 2012, 7) In addition to Indonesian and English, consideration of the quality of literature review, the , author refers to the ethical considerations of Wager & Wiffen, namely avoiding duplication of publications, avoiding plagiarism, transparency, and ensuring accuracy. From the results of *literature review* searches through Google scholar data, *Publish or Perish* and Mendeley who use the *keyword* "*Diabetes Mellitus*" AND "Effect of Diabetes Therapy" *AND "* Control of the four pillars". In the search for journals, the author found 1000 journals and then the journals were selected, there were 691 exclusion journals due to duplicates and *irrelevant studies*, 291 journals that were excluded because they did not meet the PICOS criteria and 6 journals that were excluded because they were not included in the SANRA assessment criteria. The feasibility assessment of 1000 journals obtained 12 journals that were *reviewed*.

2.4 *Instruments*

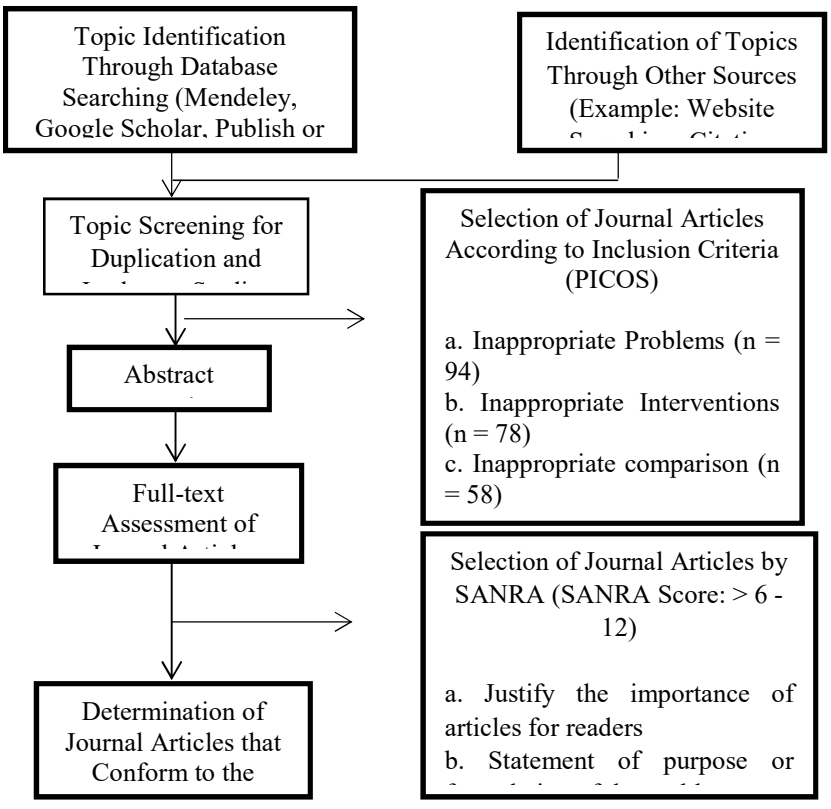
The evaluation used in this literature review uses the SANRA checklist. Keywords in searching for journals, use the AND keyword which is used for more detail in searching for journals and can make it easier to search for the desired journal. The keywords used are "Diabetes Mellitus AND Effects of Diabetes Therapy AND Control of the four pillars".

Table 1. PICOS Format in Literature Review

Criteria	Inklusi	Eksklusi
Problem	The journal used is a journal related to the effect of Diabetes Mellitus therapy on reducing blood sugar levels.	In addition to journals related to the effect of Diabetes Mellitus therapy on reducing blood sugar levels.
Intervention	Provision of non-pharmacological therapy in patients with Diabetes Mellitus	In addition to the journal of giving therapy to people with Diabetes Mellitus
Comparation	There are comparability factors between non-pharmacological diet therapy and physical activity therapy	There is no comparison between diet therapy and physical activity therapy
Outcome	The effect of therapy on reducing blood sugar levels	There is no therapeutic effect on reducing blood sugar levels
Study Design	Correlational descriptive using cross-sectional approach Pre-experimental with One group pretest and posttest design, Quasi Experiment, Observational method with retrospective study design	In addition to correlational descriptive using a cross-sectional approach, pre-experimental with one group pretest and posttest design, quasi-experimental, observational method with retrospective study design
Publication Year	2012-2022	Under 2012
Language	Indonesian and English language	Besides Indonesian and English

2.5 Data Analysis

Bagan 1. Study Search Results Based on Research Database



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Tabel 2. Literature Search Results

No	Author	Year	Volume/ Number	Title	Methods (Design, Sample, Variables, Instruments, Analysis)	Research result	Databases
1	I Made Sundayana, I Dewa Ayu Rismayanti, Ida Ayu Putu Desta Candra Devi	2021	5/1	Decreased Blood Sugar Levels in Type 2 DM Patients with Physical Activity	D : descriptive correlation using a cross-sectional approach S : Purposive Sampling V : The independent variable is physical activity. While the dependent variable is a decrease in blood sugar levels in type 2 DM patients I : Global Physical Activity Questionnaire (GPAQ) A : Univariate analysis in the form of descriptive analysis and bivariate analysis using Spearman rank correlation test	The results showed that the majority of respondents suffering from type 2 DM were women. Gender is also one of the factors that can affect a person's physical activity. There is a relationship between physical activity and a decrease in blood sugar levels. Because when someone does physical activity there is an increase in the use of glucose by active muscles so that it can directly causing a decrease in the amount of blood sugar levels in the body, the more routine a person does physical activity, the more controlled a person's blood sugar level will be	Google Scholar
2	Almaini, Hendri Heriyanto	2019	1/1	Effect of Compliance with Diet, Physical Activity and Medication with Changes in Blood Sugar Levels	D: Cross-sectional study S: Purposive Sampling V : The independent variable is the influence of adherence to diet, physical activity and medication. The dependent variable is the change in blood sugar levels. I : Food recall form, pill count regimen questionnaire, and	The research results are there significant relationship between diet adherence, medication adherence and blood glucose levels in DM patients from the Rejang tribe, Rejang Lebong Regency. DM patients are expected to always comply with diet, physical activity and	Mendeley

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				in Patients Diabetes Mellitus of the Rejang Tribe	physical activity questionnaire. A : Univariate analysis in the form of bivariate analysis using chi square and odds ratio.	medication.	
3	Septa Setyawan, Sono	2015	11/1	The Relationship between Physical Activity and Blood Glucose Levels in Diabetes Mellitus Patients	D : Analytical correlation, with cross sectional approach method S : Accidental Sampling V : The independent variable is physical activity. While the dependent variable is blood glucose levels during. I: Questionnaire A : Univariate analysis using the chi square correlation test	The test results in this study showed that there was a relationship between physical activity and blood glucose levels during diabetes mellitus patients, where blood glucose levels would be controlled in patients who carried out activities as recommended compared to patients who did not carry out physical activities as recommended.	Publish or perish
4	Febri Fitriani, RA Fadilla	2020	10/19	The Effect of Diabetic Exercise on Reducing Blood Sugar Levels in Diabetes Mellitus Patients	D : Pre-experimental with One group pretest and posttest design S : Purposive Sampling V : The independent variable is Diabetes Exercise. While the dependent variable is a decrease in blood sugar levels. I : Observation sheets, questionnaires A: Univariate and bivariate analysis using the one sample Kolmogorov-Smirnov test then the effect of using the Paired Samples T Test statistical test	Based on the results of the research and discussion above, the researchers argue that diabetes exercise is one of the most effective physical activities if done regularly. There is a significant effect of diabetes exercise on reducing blood sugar levels in patients with type 2 Diabetes Mellitus at the Smponi Danarieva Medika Clinic Palembang.	Publish or perish
5	Graceistin Ruben Julia villy Rottie	2016	4/1	The Effect of Diabetic Foot Exercise on Changes in	D : Pre-experimental with one group pretest posttest design S : Total Sampling V : The independent variable is	The results of the study showed that there was an effect of diabetic foot exercise on changes in sugar levels in patients with	Google Scholar

	Michael Y. Karundeng		Blood Sugar Levels in Patients with Type 2 Diabetes Mellitus in the Work Area of the Enemawira Health Center	Diabetic Foot Exercise. While the dependent variable is Changes in Blood Sugar Levels I: Questionnaire A: T-test paired samples test	type 2 Diabetes Mellitus in the working area of the Enemawira Health Center.	
6	Yeni Yulianti, Riyan Sulistiana Januari	2021	4/2	Effect of Diabetes Mellitus Foot Exercise on Blood Sugar Levels of Type 2 DM Patients in the Work Area of the Ciemas Health Center	D : Quasi Experiment S : Purposive Sampling V : The independent variable is Diabetes Mellitus Foot Exercise. While the dependent variable is Blood Sugar Levels I : SOP and Glukotest tool A : Test the hypothesis using the Paired sample t-Test	The results of the research and discussion show that there is an effect of Diabetes Mellitus foot exercises on changes in blood sugar levels in type 2 Diabetes Mellitus sufferers in the working area of the Ciemas Health Center, Sukabumi Regency.	Google Scholar
7	Nur Salma, Fadli, Abdul Hayat Fattah	2020	11/1	Relationship of Diet Compliance with Fasting Blood Sugar Levels in Patients with Type 2 Diabetes Mellitus	D : Quantitative research by using the correlation method and the approach used is a cross sectional study S: Non-probability sampling technique, namely total sampling V : The independent variable is Diet Compliance. While the dependent variable is Fasting Sugar Levels I : Questionnaire A : Univariate and bivariate	This shows that there is an effect of dietary adherence on fasting blood sugar levels in type 2 Diabetes Mellitus patients at the Lancirang Health Center in 2020, while the percentage of influence is 14.4%, which is indicated by the value of R square = 0.144. So that in the process of lowering fasting blood sugar, it is better for sufferers or patients to change their behavior, especially in	Mendeley

				analysis	dietary compliance based on the number of calories in their food	
8	Nany Suryani, Pramono,Henny Septiana	2015	6/2	Diet and Exercise as an Effort to Control Blood Sugar Levels in Patients with Type 2 Diabetes Mellitus at the Internal Medicine Polyclinic at Ulin Hospital, Banjarmasin, 2015	D : Observational method with retrospective study design S : Purposive Sampling V : The independent variables are Diet and Exercise. While the dependent variable is Control of Blood Sugar Levels I : Interview, Questionnaire A : Bivariate analysis using chi-square test	From the results of the study it can be concluded that there is a significant relationship that respondents whose blood sugar diet is not controlled will be 29 times greater than those who do not diet and exercise their blood sugar respondents will be examined more than 35 times compared to those who do not exercise. Diet and exercise can help to control blood sugar levels and help the most effective treatment.	Mendeley
9	T. Eltrikanawati, Nurlaila, Masitoh Tampubolon	2020	6/2	The Relationship between Diet and Physical Activity Patterns Against Blood Sugar Levels When On Type 2 Diabetes Mellitus Patients	D : Correlation design with cross sectional research design S : Purposive Sampling V : The independent variables are diet and activity patterns. While the dependent variable is Blood Sugar Levels During I : Questionnaire, Observation Sheet, Glucotest A : Univariate analysis and bivariate analysis with using the Mann-Whitney test	The results showed that there was a significant relationship between diet and physical activity patterns on temporary blood sugar levels in patients with type 2 Diabetes Mellitus It is recommended for patients with Type 2 Diabetes Mellitus to regulate and maintain a balanced diet in terms of amount, frequency, and content consumed every day by conducting consultations at health services, carrying out regular physical activities in	Mendeley

						daily life, as well as carrying out routine self-checking of blood sugar levels so that blood sugar levels are within limits normal and stable.	
10	Ahmad Baequny, Afiyah Sri Harnany, Elsye Rumimper	2015	4/1	The Effect of a High-Calorie Diet on Increasing Blood Sugar Levels in Patients with Type 2 Diabetes Mellitus	D : Descriptive analytic with cross sectional design S : Simple random sampling V : The independent variable is the High-Calorie Diet. While the dependent variable is an increase in blood sugar levels. I : Questionnaire A : Chi-Square	The results of the study show that there is an effect of diet on blood sugar levels, this further reinforces the importance of managing diet both in type, amount and schedule to control blood sugar levels. So that respondents need to increase their knowledge and comply, especially about the right diet so that blood sugar levels can be controlled.	Google Scholar
11	Elis Anita Farida, Citra Amaniah Anhar, Farida Anwari, Acivrida Mega Charisma, Arif Rahman Nurdianto	2022	5/1	The Effectiveness of Diabetes Exercise on Blood Glucose Levels in Patients with Diabetes Mellitus at the Trosobo Health Center, Sidoarjo	D : Pre-Experiment Design in the form of Pre-Posttest Design S : Purposive sampling V : The independent variable is Diabetes Exercise. While the dependent variable is Blood Glucose Levels I : Questionnaire, Glucotest A : Test paired sample T-Test	The results of the study showed a decrease in blood glucose levels between before being given diabetes exercise and after being given diabetes exercise, so that diabetes exercise was effective for reducing blood sugar levels in people with Diabetes Mellitus at the Trosobo Health Center, Sidoarjo.	Google Scholar
12	Nurlinawati, Kamariyah	2018	1/1	Effect of Diabetic Foot	D : Pre-experimental using pre and posttest group design with	The research results are known before doing gymnastics	Google Scholar

dan Yuliana	Exercise on Changes in Sugar Levels Blood in Patients with Diabetes Mellitus in the Work Area Simpang Sungai Duren Health Center Muaro Jambi Regency	control group S : Random sampling V : The independent variable is Diabetic Foot Exercise. While the dependent variable is Blood Sugar Levels I : Observation Sheet A : Test paired sample test	It is known that all (100%) of respondents in the intervention and control groups experienced high blood sugar levels. After doing leg exercises it is known that as many 11 (100%) respondents in the intervention group experienced a decrease in blood sugar levels. The results of the study are known to have an effect on reducing blood sugar levels in respondents intervention group.

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3. RESULT

3.1 General Characteristics of Literature

In this section there is literature whose authenticity can be accounted for with research purposes. The display of literature results in the final literature review task contains a summary and main results of each selected article in tabular form, then under the table section what is contained in the table is explained in the form of meanings and trends in paragraph form.

Tabel 3. General Characteristics of Literature

No	Category	f	%
A	**Year of Publication**		
1.	2015	2	16,6
2.	2016	2	16,6
3.	2018	1	8,3
4.	2019	1	8,3
5.	2020	3	24,9
6.	2021	2	16,6
7.	2022	1	8,3
	AMOUNT	12	100
B	**Research design**		
1.	*Cross-sectional study*	6	49,8
2.	Pra eksperimental (*Pre and Posttest Design*)	4	33,2
3.	*Quasi eksperiment*	1	8,3
4.	*Retrospective design*	1	8,3
	AMOUNT	12	100
C	**Research Sampling**		
1.	*Purposive sampling*	7	58,1
2.	*Accidental sampling*	1	8,3
3.	*Total sampling*	2	16,6
4.	*Simple Random sampling*	1	8,3
5.	*Random sampling*	1	8,3
	AMOUNT	12	100
D	**Research Instruments**		
1.	Kuesioner	5	41,5
2.	Kuesioner dan Lembar Observasi	2	16,6
3.	SOP dan Alat *Glucotest*	1	8,3
4.	Kuesioner dan Wawancara	1	8,3
5.	Kuesioner, Lembar Observasi dan Alat *Glucotest*	1	8,3
6.	Kuesioner dan Alat *Glucotest*	1	8,3
7.	Lembar Observasi	1	8,3
	AMOUNT	12	100
E	**Research Statistical Analysis**		
1.	*Spearman rank*	1	8,3
2.	*Chi-square*	4	33,2
3.	*Paired Sample T test*	5	41,5
4.	Analisis Univariat dan Bivariat	1	8,3
5.	*Mann-Whitney*	1	8,3
	AMOUNT	12	100

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3.2 Characteristics of Research Results

Contains the search results for the source of the articles used which are included in the study characteristics table, after which the articles used in the literature review are explained one by one.

Table 4. Characteristics of Research Results

No	Category	f	%
A.	**Types Of *Diabetes Melitus* Therapy**		
1.	Physical activity	8	66,6
2.	Diet	4	33,3
	AMOUNT	12	100
B.	**Blood sugar levels**		
1.	Sugar Levels Rise	0	0
2.	Sugar Levels Dropped	12	100
	AMOUNT	12	100

3.3 Research Analysis

Tabel 5. Analisis Penelitian

No	Variables studied	Literature Analysis	Empirical Sources
1.	Effect of Physical Activity on Decreased Blood Sugar Levels	The results showed that there was an effect between physical activity and a decrease in blood sugar levels. Because when a person does physical activity there will be an increase in the use of glucose by the muscles so that it can directly cause a decrease in the amount of sugar levels in the body. Blood sugar levels will be controlled in clients who do physical activity as recommended.	I Made Sundayana, dkk (2021); Septa Setyawan, Sono (2015); Febri Fitriani, RA Fadilla (2020); Graceistine, Ruben, dkk (2016); Yeni Yulianti, Riyan Sulistiana Januari (2021); Elis Anita Farida, dkk (2022); Nurlinawati,dkk (2018)
2.	Pengaruh Diet terhadap Penurunan Kadar Gula dalam Darah	The results showed that there was an effect of diet or diet on reducing blood sugar levels. This further reinforces the importance of managing diet both in type, amount and schedule to control blood sugar levels.	Ahmad Baequny,dkk (2015); Nur Salma,dkk (2020)
3.	The Effect of Diet and Physical Activity on Reducing Blood Sugar Levels	The results showed that there was a significant relationship between diet and physical activity. Respondents whose blood sugar diet is not controlled will be 29 times greater than those who are not on a diet. And the respondent's blood sugar exercise will be checked more	Nany Suryani,dkk (2015); Almaini, Hendri Heriyanto (2019); T. Eltrikanawati,dkk (2020)

	than 35 times compared to those who do not exercise. Diet and physical activity can help to control blood sugar levels and assist in the most effective treatment.	

Based on the results of the analysis of the literature review, there were 12 journals that stated Ha or the alternative hypothesis was accepted. So it can be concluded that there is an influence of non-pharmacological therapy (diet and physical activity) of Diabetes Mellitus on blood sugar levels

4. CONCLUSION

One of the factors to stabilize blood sugar levels to normal is regular physical activity. Light physical activity that is recommended for people with Diabetes Mellitus includes walking, cycling, gymnastics and jogging.

Physical activity plays a very important role in controlling blood sugar levels. Uncontrolled blood sugar levels mostly occur due to physical activity that is not carried out by people with Diabetes Mellitus. When doing physical activity there is an increase in the use of glucose by active muscles so that it can directly cause a decrease in sugar levels in the body.

According to the review results, it was found that there was an effect of physical activity therapy on reducing blood sugar levels by 66.6%. Because regular physical activity can cause insulin to increase and blood sugar levels to decrease. Regular exercise will provide more benefits, controlled blood sugar and blood fat, better blood circulation, stable blood pressure and weight loss.

REFERENCES

Amir, S.M.J., Wungouw, H. & Pangemanan, D. (2015) 'Kadar Glukosa Darah Sewaktu Pada Pasien Diabetes Melitus Tipe 2 Di Puskesmas Bahu Kota Manado', *Jurnal e-Biomedik*. doi:10.35790/ebm.3.1.2015.6505.

Anita Farida, E. *et al.* (2022) 'Efektivitas Senam Diabetes Terhadap Kadar Glukosa Darah Pada Penderita Diabetes Melitus Di Puskesmas Trosobo, Sidoarjo', *Jurnal Pengabdian Kesehatan*, 5(1), pp. 27–36. Available at: https://jpk.jurnal.stikescendekiautamakudus.ac.id/index.php/jpk/article/view/189.

Baequny, A., Harnany, A.S. & Rumimper, E. (2015) 'Pengaruh Pola Makan Tinggi Kalori terhadap Peningkatan Kadar Gula Darah pada Penderita Diabetes Mellitus Tipe 2', *Jurnal Riset Kesehatan*, 4(1), pp. 687–692. Available at: http://ejournal.poltekkes-smg.ac.id/ojs/index.php/jrk/article/view/347.

Bhatt, H., Saklani, S. & Upadhayay, K. (2016) 'Anti-oxidant and anti-diabetic activities of ethanolic extract of Primula Denticulata Flowers', *Indonesian Journal of Pharmacy*, 27(2), pp. 74–79. doi:10.14499/indonesianjpharm27iss2pp74.

Ermawati, T. *et al.* (2012) 'Periodontitis Dan Diabetes Melitus', *J.K.G Unej*, 9(3), pp. 152–154.

Frekuensi, P. *et al.* (2015) 'Jurnal penelitian keperawatan', *Manifestasi Klinis Stress*

Hospitalisasi Pada Pasien Anak Usia Prasekolah, 1(2), p. Frekuensi, P., Menurunkan, K., Tidur, K., Diabetes.

Herawati, N., Sa'pang, M. & Harna, H. (2020a) 'Kepatuhan Diet Dan Aktivitas Fisik Pasien Diabetes Melitus Tipe 2 Yang Sudah Mengikuti Prolanis', *Nutrire Diaita*, pp. 16–22. doi:10.47007/nut.v12i01.3154.

Herawati, N., Sa'pang, M. & Harna, H. (2020b) 'Kepatuhan Diet Dan Aktivitas Fisik Pasien Diabetes Melitus Tipe 2 Yang Sudah Mengikuti Prolanis', *Nutrire Diaita*, 12(01). doi:10.47007/nut.v12i01.3154.

I D F Diabetes (2017) *Eighth Edition 2017*, *IDF Diabetes Atlas, 8th edition*. Available at: https://www.idf.org/aboutdiabetes/type-2-diabetes.html.

Katuuk, M. & Gannika, L. (2019) 'Hubungan Health Locus of Control Dengan Kepatuhan Terapi Insulin Pada Pasien Dm Tipe Ii Di Rsu Gmim Pancaran Kasih Manado', *Jurnal Keperawatan*, 7(1). doi:10.35790/jkp.v7i1.25225.

KEMENKES RI (2020) 'Tetap Produktif, Cegah Dan Atasi Diabetes Mellitus', *pusat data dan informasi kementrian kesehatan RI* [Preprint].

Merryana, A. (2013) 'Pengantar Gizi Masyarakat', *Pengantar Gizi Masyarakat*, pp. 48–57.

Nurarif, A. H., & Kusuma, H. (2016) *Nanda Nic-Noc Aplikasi Asuhan Keperawatan Berdasarkan Diagnosa Medis (2nd ed.)*. Jogjakarta: MediAction.

Nurayati, L. & Adriani, M. (2017) 'Hubungan Aktifitas Fisik dengan Kadar Gula Darah Puasa Penderita Diabetes Melitus Tipe 2', *Amerta Nutrition*, 1(2), p. 80. doi:10.20473/amnt.v1i2.6229.

Purwaningsih, I. & Supriyanto (2017) 'Jurnal Laboratorium', *Jurnal Laboratorium Khatulistiwa*, 1(1), pp. 89–83.

Salma, N., Fadli, F. & Fattah, A.H. (2020) 'Hubungan Kepatuhan Diet Dengan Kadar Gula Darah Puasa Pada Pasien Diabetes Melitus Tipe 2', *Media Keperawatan: Politeknik Kesehatan Makassar*, 11(1), p. 102. doi:10.32382/jmk.v11i1.1512.

Soelistijo SA, *et. al* (2021) 'Pedoman pengelolaan dan pencegahan diabetes melitus tipe 2 di Indonesia 2021', p. 46.

Soelistijo SA, *et al*. (2015) *Pedoman pengelolaan dan pencegahan diabetes melitus tipe 2 di Indonesia*, *Perkeni*.

Suciana, F. and Arifianto, D. (2019) 'Penatalaksanaan 5 Pilar Pengendalian Dm Terhadap Kualitas Hidup Pasien Dm Tipe 2', *Jurnal Ilmiah Permas: Jurnal Ilmiah STIKES Kendal*, 9(4), pp. 311–318.

Suryani, N., Pramono, & Henny, S. (2015) 'Diet dan Olahraga sebagai Upaya Pengendalian Kadar Gula Darah pada Pasien Diabetes Melitus Tipe 2 di Poliklinik Penyakit Dalam RSUD Ulin Banjarmasin Tahun 2015', *Jurnal Kesehatan Indonesia*, (8), pp. 1–10. Available at: https://journal.stikeshb.ac.id/index.php/jurkessia/article/view/19.

Susanti, S. & Bistara, D.N. (2018) 'Hubungan Pola Makan Dengan Kadar Gula Darah Pada Penderita Diabetes Mellitus', *Jurnal Kesehatan Vokasional*, 3(1), p. 29. doi:10.22146/jkesvo.34080.

Tipe, M. & Kota, D.I. (2017) 'Jurnal of Health Education', 2(2), pp. 138–145.

Yosmar, R., Almasdy, D. & Rahma, F. (2018) 'Jurnal Sains Farmasi Dan Klinis', *Survei risiko penyakit diabetes melitus terhadap kesehatan masyarakat kota padang*, 5(Agustus 2018), pp. 134–141.

Yulianti, Y. & Januari, R.S. (2021) 'Pengaruh Senam Kaki Diabetes Mellitus terhadap Kadar Gula Darah Penderita DM Tipe 2 di Wilayah Kerja Puskesmas Ciemas', *Lentera : Jurnal Ilmiah Kesehatan dan Keperawatan*, 4(2), pp. 87–94. doi:10.37150/jl.v4i2.1444.