

Effect Of Diabetic Gymnastics Therapy And Physical Activity On The Control Of Fasting Blood Sugar Levels In People With Diabetes Mellitus In The Work Area Of Tiron Health Center

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ABSTRACT

Diabetes is still recorded as the cause of death in the world with a prevalence that always increases significantly every year. The view that is a risk factor for diabetes mellitus is lifestyle including those that include food or physical activity such as exercise, blood sugar monitoring, and treatment (Irwansyah, 2021). This study aims to analyze the effect of diabetic gymnastics therapy and physical activity on controlling fasting blood sugar levels in people with diabetes mellitus in the work area of the Tiron Health Center. The research method uses an analytical observation research design with a cross-sectional approach, the data collection technique uses a questionnaire with a total sample of 36 respondents. The sampling method uses purposive sampling, data analysis uses ordinal regression. The results showed that it was known that most of the respondents with diabetic gymnastics were often, namely, 26 respondents (72.2%) out of a total of 36 respondents. The results of the study on moderate category physical activity were 27 respondents (75%) out of a total of 36 respondents. The results of the study on normoglycemia fasting blood sugar levels were 36 respondents (88.9%). The results of the ordinal regression statistical test obtained the sig value. obtained by $0.000 < \alpha = 0.05$, meaning "there is an effect of diabetes gymnastics therapy and physical activity on the control of fasting blood sugar levels in people with diabetes mellitus in the work area of the Tiron Health Center. Diabetes gymnastics and regular physical activity can increase the sensitivity of insulin work for the better which has an impact on blood sugar levels to be more stable, so that very influential and significant results were obtained in this study.

Keyword : Diabetic Gymnastics, Diabetes Mellitus, Blood Sugar Levels.

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INTRODUCTION

Diabetes is still recorded as the cause of death in the world with a prevalence that always increases significantly every year. The view that is a risk factor for diabetes mellitus is lifestyle including those that include food or physical activity such as exercise, blood sugar monitoring, and treatment (Irwansyah, 2021). Based on data from the International Diabetes Federation (IDF), the number of people with diabetes mellitus type 1 is 5-10% and diabetes mellitus type 2 is 90-95% of people with diabetes mellitus worldwide (IDF, 2021). Based on data from the Indonesian Diabetes Association & PERKENI in (Fitriyanti Nurdin, 2021) diabetes mellitus as a global problem continues to increase its prevalence from year to year both in the world and in Indonesia.

Indonesia ranks third in the Southeast Asia region with a prevalence of 11.3% (Infodatin, 2020). The results of the Riskesdas survey data in 2018 East Java Province recorded that the prevalence of diabetes mellitus diagnosed was 2.02% in terms of the total national prevalence (Jayanti & Fitriyani, 2022). There are 15,308 people with diabetes mellitus in Kediri Regency. Early detection of risk factors screened at the productive age of 28,336 people (19.9%), while the number of men was 6,594 people (12.9%) and 21,742 women (23.8%) (Kediri Regency Health Profile Data, 2020).

The preliminary study was conducted in the working area of the Tiron Health Center, Kediri Regency, which houses 52 hamlets, 324 RT 114 RW. On July 4, 2022, researchers obtained data on respondents diagnosed with diabetes mellitus, in 2020 there were 368 old cases and 47 new cases with a male prevalence of 124 people and 292 women, in 2021 there were 340 old cases and new cases with a prevalence of 259 men and 245 women (Tiron Health Center Data, 2022).

Based on the results of interviews conducted by researchers on 10 people who had diabetes mellitus in the work area of the Tiron Health Center, it was found that 7 people complained of weakness if they did not do activities, often felt thirsty, often urinated, especially at night, 3 people said that their bodies were not too weak because in the morning they carried out activities such as walking in the morning and stretching on the legs and hands to be more relaxed. Based on interviews 3 out of 10 people do insulin therapy.

The management of exercise or physical exercise is one of the five pillars of diabetes management apart from diet, medicine, education and monitoring. Exercise in the sense of physical movement or muscle movement can increase metabolism or the formation and expenditure of body energy, resulting in the consumption of oxygen and energy increasing by about 20 times, so the use of glucose can also be used in large quantities by not requiring large amounts of insulin because muscle fibers become more permeable to glucose due to contractions of the muscles themselves (Yoga Ginanjar, Iga Damayanti, 2022).

The increasing number of patients affected by diabetes mellitus from year to year requires lifelong management so that blood sugar is controlled and prevents complications. One of these management is physical exercise by doing diabetic gymnastics regularly. Diabetes needs to do self-care as early as possible, of course, it requires the patient's self-acceptance of the pain. The wrong perception of the patient will result in the patient not doing self-care and making the wrong decisions so as to make blood sugar unstable. The quality of life of diabetes also plays an important role in controlling blood sugar and minimizing the appearance of complications. Based on the description above, researchers interested in this problem will conduct a study "The Effect of Diabetes Gymnastics Therapy and Physical Activity on The Control of Fasting Blood Sugar Levels in People with Diabetes Mellitus in the Tiron Health Center Work Area".

METHODS

In this study, researchers used an observational analytical research design with a cross-sectional approach. This study was conducted in the work area of the Tiron Health Center, a sample collection technique using purposive sampling, with a total of 36 people. Data were collected using questionnaires, statistical test results using ordinal regression tests.

RESULTS

Characteristics of respondents:

Based on the results of the study, it is known that most respondents have an age range of 56-65 years, namely, 24 respondents (67%). Based on the results of the study, it is known that most respondents have a female gender, namely, 28 respondents (78%). Based on the results of the study, it is known that most respondents have a long history of suffering from the 1-5 year category, namely, 33 respondents (92%). Based on the results of the study, it is known that most respondents have a normal category body mass index, which is 26 respondents (72%). Based on the results of the study, it is known that respondents have a history of drug consumption with an occasional category, namely, 23 respondents (64%).

Variable Characteristics :

Based on the results of the study, it is known that most respondents did diabetic gymnastics in the frequent category, namely 26 respondents (72.2%). Based on the results of the research, it is known that most respondents perform physical activity in the moderate category, namely 27 respondents (75%). Based on the results of the study, it is known that most respondents with fasting blood sugar levels in the normoglycemia category, namely 32 respondents (88.9%).

Statistical Test Results

Table 1 Statistical Test Result

Model Fitting Information				
	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	19.69981			
Final	2.22207	17.47774	2	.000

Link function :
Logit.

Based on the results of the Ordinal Regression Test conducted by researchers, it is known that the sig value. $0.000 < \alpha = 0.05$ the data is declared fit or appropriate if the sig value. less than 0.05. So H_0 was rejected and H_1 was accepted which means "There is an Effect of Diabetes Gymnastics Therapy and Physical Activity on The Control of Fasting Blood Sugar Levels in People with Diabetes Mellitus".

Table 2 Output SPSS

	Pseudo R-Square
Cox and Snell	.385
Nagelkerke	.766
McFadden	.696

Link fuction : Logit.

Based on the table above, a correlation value of 0.766 multiplied by 100% = 76.6% is obtained, which means that the correlation between strong variables, variables (x) diabetes gymnastics therapy and physical activity both have an influence on variable (y) fasting blood sugar levels. Diabetes gymnastics therapy and physical activity both have an influence on the stability of fasting blood sugar levels in people with diabetes mellitus.

A. Diabetes Gymnastics Therapy in People with Diabetes Mellitus in the Tiron Health Center Work Area.

Based on the results of the study interpreted diabetes gymnastics therapy in people with diabetes mellitus in the work area of the Tiron Health Center, it is known that most of the respondents who performed diabetes gymnastics in the frequent category, namely, 26 respondents (72.2%). Based on the results of the study, it is known that half of the respondents had an age range of 56-65 years with frequent diabetic gymnastics, namely, 18 respondents (50%). Gender obtained data that respondents with diabetic gymnastics in the frequent category were women with 23 respondents (63.9%) and men with 3 respondents (8.3%). Data with diabetic gymnastics category sometimes were women with 5 respondents (13.9%).

B. Physical Activity in People with Diabetes Mellitus in the Tiron Health Center Work Area.

Based on the results of the study, it was interpreted that physical activity in people with diabetes mellitus in the work area of the Tiron Health Center was mostly respondents with moderate category physical activity, namely 27 respondents (75%). Based on the results of the study, data was obtained that respondents with moderate activity mostly had an age range category of 56-65 years, namely, 20 respondents (55.6%). Gender obtained data that most of the respondents with moderate physical activity were respondents with a female gender, namely, 19 respondents (52.8%).

C. Fasting Blood Sugar Levels in People with Diabetes Mellitus in the Tiron Health Center Work Area.

Based on the results of the study, it was interpreted that fasting blood sugar levels in people with diabetes mellitus in the work area of the Tiron Health Center, it was found that most of them had normoglycemia categories, namely, 32 respondents (88.9%).

Based on the results of the study, data were obtained from most respondents with normoglycemia fasting blood sugar levels having an age range category of 56-65 years, namely, 22 respondents (61.6%). Gender obtained data that female respondents with normoglycemia fasting blood sugar levels were 24 respondents (66.7%). Long suffering obtained data that most respondents experienced normoglycemia with a long period of suffering from 1-5 years, namely, 29 respondents (80.6%). Body mass index obtained data that most respondents had a normal body mass index with normoglycemia blood sugar levels,

namely, 23 respondents (63.9%). Drug consumption obtained data that most of the history of drug consumption category sometimes with normoglycemia fasting blood sugar levels, namely, 20 respondents (55.6%).

D. Effect of Diabetes Gymnastics on Fasting Blood Sugar Levels in People with Diabetes Mellitus in the Tiron Health Center Work Area

Based on the results of the study, it was interpreted that diabetic gymnastics in people with diabetes mellitus in the work area of the Tiron Health Center was known to be mostly with respondents doing diabetic gymnastics in the category of often with normoglycemia fasting blood sugar levels, namely, 22 respondents (61.1%).

E. Effect of Physical Activity on Fasting Blood Sugar Levels in People with Diabetes Mellitus in the Tiron Health Center Work Area

Based on the results of the study, it was interpreted that physical activity in people with diabetes mellitus in the work area of the Tiron Health Center was known to be mostly with respondents in the moderate physical activity category with normoglycemia fasting blood sugar levels, namely, 27 respondents (75%).

F. Effect of Diabetes Gymnastics Therapy and Physical Activity on The Control of Fasting Blood Sugar Levels in People with Diabetes Mellitus in the Tiron Health Center Work Area.

Based on the results of research conducted by researchers, the results of the Ordinal Regression Test were obtained, which was known to have a sig value. $0.000 < \alpha = 0.05$ the data is declared fit or appropriate if the sig value. less than 0.05. Meanwhile, the correlation value of 0.766 multiplied by 100% = 76.6% is obtained, which means that the correlation between strong variables, variables (x) of diabetes gymnastics therapy and physical activity both influence the variable (y) fasting blood sugar levels. Diabetes gymnastics therapy and physical activity both have an influence on the stability of fasting blood sugar levels in people with diabetes mellitus. So H_0 was rejected and H_1 was accepted which means "There is an Effect of Diabetes Gymnastics Therapy and Physical Activity on The Control of Fasting Blood Sugar Levels in People with Diabetes Mellitus".

The results showed that most respondents performed diabetic gymnastics in the frequent category with normoglycemia fasting blood sugar levels, namely, 22 respondents (61.1%) out of a total of 36 respondents. Based on the facts and theories in the discussion above, researchers argue that diabetes gymnastics therapy and physical activity have a strong influence on fasting blood sugar levels, because diabetes gymnastics therapy and physical activity are one of the most important factors in controlling fasting blood sugar levels in addition to adherence to taking medications, diet. Diabetes gymnastics therapy and daily physical activity that is carried out regularly can increase the sensitivity of insulin work which can lower blood sugar levels. In addition, diabetic gymnastics and physical activity can help with physical fitness. Physical activity can be work, doing household activities, cycling, walking, and so on.

According to research from (Fitriani, n.d.) while exercising, muscles contract and then experience relaxation. Sugar will be used or burned for energy. For energy needs, sugar will be transferred from the blood to the muscles during and after exercise. Thus, blood sugar will drop. On the other hand, exercise makes insulin more sensitive. Insulin will work better to open the entrance for sugar into the cells.

The management of exercise or physical exercise is one of the five pillars of diabetes management apart from diet, medicine, education and monitoring. Exercise in the sense of physical movement or muscle movement can increase metabolism or the formation and expenditure of body energy, resulting in the consumption of oxygen and energy increasing by

about 20 times, so the use of glucose can also be used in large quantities by not requiring large amounts of insulin because muscle fibers become more permeable to glucose due to contractions of the muscles themselves (Yoga Ginanjar, Iga Damayanti, 2022).

CONCLUSION

There is an effect of diabetic gymnastics therapy and physical activity on the control of fasting blood sugar levels in people with diabetes mellitus in the work area of the Tiron Health Center.

REFERENCES

- Andi Makbul Aman Mansyur. (2018). *Hipoglikemia Dalam Praktik Sehari-Hari*.
- Anggraini, N. W. (2017). Pengaruh Senam Diabetes Terhadap Penurunan Kadar Gula Darah Pada Pasien Diabetes Mellitus Tipe II Di Wilayah Kerja Puskesmas Tawangrejo Kota Madiun.
- Camelia Nurjannah, M. Zen Rahfiludin, A. K. (2018). Hubungan Asupan Makronutrien, Indeks Massa Tubuh (Imt) Dan Aktivitas Fisik Dengan Kesegaran Jasmani Pada Lansia, 6.
- Devi Milasari. (2018). Pengaruh Senam Diabetes Mellitus Terhadap Kadar Gula Darah Pada Penderita Diabetes Mellitus Tipe 2 Program Studi S-1 Keperawatan Sekolah Tinggi Ilmu Kesehatan. Skripsi. Jombang : Stikes Insan Cendekia Medika, 2.
- Dudi Hardianto. (2021). A Comprehensive Review Of Diabetes Mellitus: Classification, Symptoms, Diagnosis, Prevention, And Treatment, 7(January), 304–317.
- Dwi Christina Rahayuningrum, R. Y. (2018). Efektifitas Pemberian Latihan Fisik : Senam Diabetes Terhadap Pengendalian Kadar Gula Darah Pada Penderita Diabetes Mellitus, 2, 18–26.
- Emylia, N. L. (2021). Pengaruh Senam Diabetes Terhadap Penurunan Kadar Glukosa Pada Lansia : Narrative Review Program Studi Fisioterapi S1 Fakultas Ilmu Kesehatan Universitas ‘ Aisyiyah Yogyakarta Penurunan Kadar Glukosa Pada Lansia : Narrative Review.
- Eni Hastuti. (2020). Analisis Intervensi Senam Diabetes Dalam Upaya Menurunkan Kadar Gula Darah, 2(Dm), 41–50.
- Fara Shoufika. (2018). Hubungan Faktor Perilaku Pengendalian Diabetes Mellitus Tipe 2 Dengan Kadar Gula Darah Lansia Di Posbindu Di Wilayah Kerja Puskesmas Patihan. Skripsi. Madiun : Stikes Bakti Husada Mulia.
- Fitriani, F. (N.D.). Pengaruh Senam Diabetes Terhadap Penurunan Kadar, 10(19).
- Fitriani, F. (2020). Pengaruh Senam Diabetes Terhadap Penurunan Kadar, 10(19).
- Fitriani Nasution, Andilala, A. A. S. (2021). Faktor Risiko Kejadian Diabetes Mellitus, 9(2), 94–102.
- Fitriyanti Nurdin. (2021). Persepsi Penyakit Dan Perawatan Diri Dengan Kualitas Hidup

Diabetes Mellitus Type 2, 4, 566–575.

Husna, A., Jafar, N., Hidayanti, H., Dachlan, D. M., Gizi, D. I., Masyarakat, F. K., ... Darah, G. (N.D.). Hubungan Kepatuhan Minum Obat Dengan Gula Darah The Correlation Of Compliance Of Medication Consumption With Blood Glucose In Type Ii Dm Patients In The Tamalanrea, 000, 20–26.

Idf. (2021).

Imas Masturoh, & Nauri Anggita T. (2018). Metodologi Penelitian Kesehatan.

Infodatin-Diabetes. (2020).

Irwansyah, I. S. K. (2021). Identifikasi Keterkaitan Lifestyle Dengan Risiko Diabetes Melitus, 10, 62–69. <https://doi.org/10.26544/2654-4563> Dan P-ISSN: 2354-
<https://doi.org/10.35816/jiskh.v10i1.511>

Jayanti, K. D., & Fitriyani, N. (2022). Gambaran Karakteristik Pasien Diabetes Melitus Di Puskesmas Semen Tahun 2021 Diabetes Mellitus Patients Characteristic At Semen Health Center In 2021, 1(1).

Komariah, & Sri Rahayu. (2020). Dengan Kadar Gula Darah Puasa Pada Pasien Diabetes Melitus Tipe 2 Di Klinik Pratama Rawat Jalan, (Dm), 41–50.

Koto, Y., & Purnama, A. (2020). Pola Hidup Sehat Dalam Mengurangi Hipertensi Dan Diabetes Di Cengkareng, 01(01), 12–16.

Lesmana, H. S., Broto, E. P., Keolahragaan, F. I., Padang, U. N., Sakit, R., Daerah, U., ... Barat, S. (2018). Profil Glukosa Darah Sebelum , Setelah Latihan Fisik Submaksimal Dan Selelah Fase Pemulihan Pada Mahasiswa FIK, 8.

Lestari, Zulkarnain, & Sijid, S. A. (2021). Diabetes Melitus : Review Etiologi , Patofisiologi , Gejala , Penyebab , Cara Pemeriksaan , Cara Pengobatan Dan Cara Pencegahan, (November), 237–241.

Rahmasari, I. (2019). Efektivitas Memordoca Carantia (Pare) Terhadap Penurunan Kadar Glukosa Darah, 9(1), 57–64.

Sahara, I. (2017). Hubungan Aktivitas Fisik Terhadap Kadar Glukosa Darah Puasa Pada Pelajar Di SMA Olahraga Negeri Sriwijaya.

Siregar, H. K., Batubara, K., Empraninta, H. E., & Pabanne, U. (2022). Relationship Between Knowledge And Attitude About Prevention Of Diabetes Mellitus Complications In Diabetes Mellitus Patients Article Info Abstract Relationship Between Knowledge And Attitude About Prevention Of Diabetes Mellitus Complications In Diabetes Mellitus Patients Diabetes Mellitus Is A Group Of Metabolic According To The World Health Organization (WHO), Indonesia Ranks Fourth Largest In, (March). <https://doi.org/10.26714/seanr.3.4.2021.153-159>

Universitas Nahdatul Ulama Surabaya. (N.D.). Standar Operasional Prosedur (SOP) Senam Diabetes Mellitus.

Vera Septriana. (2021). Pengaruh Senam Kaki Diabetik Terhadap Kadar Gula Darah Pada Penderita Diabetes Mellitus Tipe 2 Di Wilayah Kerja UPTD Puskesmas Tanjung Agung Kabupaten Oku.

WHO. (2019). Classification Of Diabetes Mellitus.

Widyastuti, D. A. (2019). Tingkat Ketergantungan Lansia Berdasarkan Usia Dan Jenis Kelamin Di Panti Sosial Trsena Werda Nirwana Puri Samarinda, *1*(1), 1–15.

Yoga Ginanjar, Iga Damayanti, I. P. (2022). Pengaruh Senam Diabetes Terhadap Penurunan Kadar Gula Darah Pada Penderita Diabetes Mellitus Di Wilayah Kerja Pkm Ciamis Kabupaten Ciamis Tahun 2021 Program Studi Ilmu Keperawatan Fakultas Ilmu Kesehatan Universitas Galuh , Indonesia, *4*(1).