***Senam DM berdampak pada Resiliensi dan tingkat stress: Fakta atau Mitos?***

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***Abstrak****:*

Diabetes Mellitus merupakan salah satu penyakit yang ditandai dengan gangguan kontrol glukosa karena gangguan sekresi insulin yang memerlukan pengobatan yang lama dengan berbagai komplikasi yang dapat menyertainya. Hal ini berakibat pada resiliensi serta memicu tingkat stress penderita DM. Tujuan penelitian ini adalah untuk mengetahui adanya pengaruh sebelum dan sesudah senam DM terhadap resiliensi dan tingkat stress penderita DM. desain penelitian menggunakan Quasy Experimental (Pre & Post test) design, dengan melibatkan sampel 20 orang kelompok intervensi dan 20 kelompok control yang diambil dengan tehnik *purposive sampling*. Analisis data dengan *Wilcoxon Sign Rank Test* dan *Saple t-Test dengan Asymp.Sig (2-tailed) dengan signifikansi 0,05.* Hasil penelitian didapatkan bahwa tidak ada perbedaan resiliesni dan tingkat stress sebelum dan setelah senam DM. Resiliensi adalah sebuah ukuran sejauh mana kemampuan seseorang untuk menghadapi stress dan kemampuan individu untuk bangkit dalam keadaan yang sulit. Faktor-faktor yang mempengaruhi resiliensi seseorang antara lain *sosial support, cognitive skill, psychological resources.* Senam DM secara tidak langsung tidak pengaruh terhadap resiliensi dan stress penderita diabetes. Sejalan dengan penelitian ini, sebuah penelitian kualitatif menyatakan resiliensi, support dan kemampuan perawatan diri merupakan hal penting untuk mencapai ketahanan pada penderita DM. Senam DM yang dilakukan dengan intensitas sedang dapat meningkatkan keaktifan otot, menjaga kebugaran sehingga dapat memperbaiki sensitifitas insulin yang dapat memperbaiki kontrol glukosa darah. Aspek resiliensi pada individu adalah regulasi emosi, yakni kemampuan untuk tetap tenang walupun dalam keadaan tertekan. Pengendalian stress secara optimal akan meminimalkan peningkatan glukosa darah karena hormon kortisol terkontrol dengan baik. Pada penelitian selanjutnya diharapkan tindakan Diabetes Resilence Training dan tindakan Mindfullness pada pasien DM untuk meningkatkan kualitas hidup.

*Kata kunci: diabetes mellitus, senam DM, resiliensi, stress*

***DM Exercise Impacts Resilience and Stress Levels: Fact or Myth?***

***Abstract****:*

*Diabetes Mellitus is one of the diseases characterized by impaired glucose control due to impaired insulin secretion that requires long treatment with various complications that can accompany it. This results in resilience and triggers stress levels of DM sufferers. The purpose of this study was to determine the influence before and after DM exercise on the resilience and stress level of DM sufferers. The study design used Quasy Experimental (Pre & Post test) design, involving a sample of 20 intervention groups and 20 control groups taken with purposive sampling techniques. Data analysis with Wilcoxon Sign Rank Test and Saple t-Test with Asymp.Sig (2-tailed) with significance 0.05. The results of the study found that there was no difference in resiliesni and stress levels before and after DM exercise. Resilience is a measure of a person's ability to deal with stress and an individual's ability to bounce back in difficult circumstances. Factors that affect a person's resilience include social support, cognitive skills, psychological resources. DM exercise indirectly does not affect the resilience and stress of diabetics. In line with this study, a qualitative study states resilience, support and self-care ability are important to achieve resilience in people with DM. DM exercise done with moderate intensity can increase muscle activity, maintain fitness so that it can improve insulin sensitivity which can improve blood glucose control. The aspect of resilience in individuals is emotional regulation, namely the ability to remain calm even in a depressed state. Optimal stress control will minimize the increase in blood glucose because the hormone cortisol is well controlled. In future studies, it is expected that Diabetes Resilence Training and Mindfullness actions in DM patients to improve quality of life.*

*Keywords: diabetes mellitus, DM gymnastics, resilience, stress*

**INTRODUCTION**

Type II DM is a disease caused by improper lifestyle, which has an impact on abnormal blood sugar levels due to impaired insulin secretion, how insulin works or can even be a combination of the two. DM includes diseases that require prolonged treatment so that it can have an impact on increasing psychological problems, decreased physical function, non-adherence to drugs and treatments, impaired glycemic control, and an increased risk of diabetes complications [1]. This triggers stress and survival of patients in their lives. The results of Riskesdas show a significant increase in the prevalence rate of DM, from 6.9% in 2013 to 8.5% in 2018, so that the estimated increase in the number of DM sufferers in Indonesia reaches more than 16 million people in 5 years. The prevalence of DM in Indonesia was 10.3 million in 2018 and is number six in the world [2]. Ironically, this is inversely proportional to the efforts made by the Government in reducing the incidence of DM in Indonesia. Physical exercise can increase metabolism or the formation and expenditure of body energy, resulting in oxygen and energy consumption increased 20 times, so that 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 contraction of the muscle itself [3]. Regular physical activity practice can improve the fitness and sensitivity of insulin in the body so that blood glucose control becomes better. The purpose of this study is to explain and analyze the effect of Diabetes Gymnastics on the stress level of diabetes mellitus patients before and after the intervention.

## RESEARCH METHODS

## The research design to be used is Quasi Experimental (pre &; post test) Design. The study population was all type II DM patients in Sukosari Village, Ngrandu Health Center. Samples were taken by purposive sampling technique, then divided into a treatment group of 20 respondents and a control of 20 respondents. Stress level assessment was carried out twice, namely before the intervention and after the intervention. Data analysis with Wilcoxon Test and simple t-test [4]. Inclusion criteria: DM patients aged 36 – 65 years, mild-moderate stress, long illness 1 – 5 years, not experiencing musculoskeletal disorders. The dependent variable is DM gymnastics and the independent variable is resilience and stress level. The data collection instruments are the Resilience Questionnaire and DASS questionnaires [5]. Data collection will be carried out in Sukosari Village in June–September 2023. The hypothesis of this study is: there is an influence of DM gymnastics on resilience and stress levels. Data were analyzed statistically using frequency and crosstab descriptive statistical tests, as well as non-parametric correlation tests Data analysis using Wilcoxon Signed Ranks Test and Asymp.Sig (2-tailed) t-test samples with significance of 0.05.

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## RESEARCH RESULTS

## Table 1.

**Characteristics of Respondents**

|  |  |
| --- | --- |
| Characteristics | Kelompok |
| Intervention (n:20) | Control(n:20) |
| **Age (th)** |  |  |  |  |
| 26 – 35  | 2 | 10 | 1 | 5 |
| 36 – 45  | 3 | 15 | 1 | 5 |
| 46 – 55  | 8 | 40 | 9 | 45 |
| 56 – 65  | 6 | 30 | 5 | 25 |
| > 65  | 1 | 5 | 4 | 20 |
| **Gender** |  |  |  |  |
| Laki – laki  | 7 | 35 | 5 | 25 |
| Perempuan  | 13 | 65 | 15 | 75 |
| **Education** |  |  |  |  |
| SMA | 3 | 15 | 3 | 15 |
| SMP | 8 | 40 | 3 | 15 |
| SD | 6 | 30 | 9 | 45 |
| No School | 3 | 15 | 5 | 25 |

Based on table 1 above shows that the characteristics of respondents based on age, the most respondents in the intervention group were in the age range of 46 – 55 years as much as (40%) while in the control group there were in the age range of 46 – 55 years as much as (45%). In the characteristics of Gender, the most respondents were female, namely 13 respondents (65%) in the intervention group and 15 respondents (75%) in the control group. The most education respondents were 8 respondents (40%) in the intervention group and 9 respondents (45%) in the control group (40%) in the intervention group and 9 respondents (45%) in the control group.

**Table 2.**

Differences in Community

Implementation Strategy Provision

|  |
| --- |
| **Test Statisticsa** |
|  | Post Test Eksperimen - Pre-Test Eksperimen | Post-Test Kontrol - Pre-Test Kontrol |
| Z | -1.581b | -.748b |
| Asymp. Sig. (2-tailed) | .114 | .454 |

Based on table 2 above shows the value of the Wilcoxon test results known to Asymp. Sig. (2-tailed) is worth 0.114. Since 0.114 is greater than > 0.05, it can be concluded that H0 is accepted meaning that there is no difference before and after DM gymnastics on resilience.

Tabel 3

**Paired Samples Test**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | t | df | Sig. (2-tailed) |
|  |  |  |  |  |
| Pair 1 | Pre-Test Eksperimen Stres - Post Test Eksperimen Stres | .774 | 19 | .448 |
| Pair 2 | Pre-Test Kontrol Stres - Post-Test Kontrol Stres | -.782 | 19 | .444 |

## Table 3 shows that the level of stress after data analysis with paired samples test (α 0.05) in the treatment group obtained a p value of 0.448, then a p value of >0.05 which means there is no effect of DM Gymnastics intervention on stress levels. In the treatment group, a p value of 0.444 was obtained, which means that there was no difference in DM Gymnastics intervention on the stress level of DM patients.

## DISCUSSION

**The Effect of DM Gymnastics on the Resilience of Type 2 Diabetes Mellitus Patients**

Based on the data above, it shows that there is no significant effect of DM gymnastics on the resilience of type 2 diabetes mellitus patients. In data analysis, the value of Asymp is obtained. Sig. (2-tailed) is 0.114 so the value is greater than > 0.05. Quoted by Rutter (2006) in [6] resilience is a person's ability to cope with stress and adapt even in life conditions that are all hampered. This is in line with Connor and Davidson (2003), he stated resilience is a measure of the extent of a person's ability to deal with stress and the ability of individuals to rise in difficult circumstances. The quality of individual resilience is different, this depends on age, development, the number of times he faces difficulties, and support in forming resilience. [6].

Resilience does not have to be defined as a character that has been attached to the individual, but rather the result of a process. Resilience is an individual's capacity to survive stressful situations so that if an individual is said to be resilient, then the individual can find a way to survive and adjust himself even in difficult situations [7]. Perkeni (2019) stated that physical exercise is one of the seeds in the management of type 2 DM. Program regular physical exercise 30 – 45 minutes during the week for a total time of 150 minutes [8]. Physical activity is useful for maintaining fitness, besides that it can also lose weight and improve or increase insulin sensitivity in the body, so that it will be able to improve blood glucose control.

DM gymnastics can increase the body's muscle activity up to three times when doing physical activity with moderate intensity for a period of more than 20 minutes, this is mentioned [9]. The regularity of DM exercise can increase the sensitivity of receptors in producing insulin in the body. Increased insulin receptor sensitivity can increase 12-24 hours after DM exercise activities for two consecutive days because blood sugar control in the body is done less optimally [9]

Some factors that affect a person's resilience are social support, namely social support concerning; Care and attention to people around him, cognitive skills include; how to find solutions to problems, avoidance skills from self-blame, self-control and spirituality, and psychological resources include empathy, flexibility in any condition, and being able to take lessons from every event [10]. From this information, DM gymnastics has not had a resilience impact on sufferers, while in addition to physical activity there are still other factors so that a DM sufferer is able to have resilience in facing his pain. In line with this, research [11] states that resilient conditions can also be done by DM sufferers, namely by adapting to a healthy lifestyle according to the DM pillars.

A qualitative study also states that resilience, support and self-care ability are important to achieve resilience in DM sufferers [12]. So that the participation of health workers in providing comprehensive health services is very important in increasing the resilience of DM sufferers. Providing knowledge and understanding of DM disease physical and psychological aspects will contribute to increasing the resistance of DM sufferers.

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**The effect of DM Gymnastics on the stress level of type 2 diabetes mellitus patients**

Table 3 shows that the level of stress after data analysis with paired samples test (α 0.05) in the treatment group obtained a p value of 0.448, then a p value of >0.05 which means there is no effect of DM Gymnastics intervention on stress levels. In the treatment group, a p value of 0.444 was obtained, which means that there was no effect of DM Gymnastics intervention on the stress level of DM patients.

Diabetes is very sensitive to the effects of stress. Stress in many diabetic patients interferes with the process of controlling blood glucose. Studies have revealed that poor diabetes control and stressful events are positively correlated. Similarly, other research findings show that resilience-based diabetes self-management education improves psychological and physiological health in type 2 diabetes patients cited by [13]

Stress is the body's response, both physical and psychic, to the demands of the environment that cause tension and disruption to daily life [11]. Reciprocity is a coexistence that describes an individual's ability to maintain his psychological and/or physical well-being. In undergoing the DM prolanis program, DM sufferers must have excellent resilience, because DM sufferers undergo prolanis in a long span of time. This condition certainly causes boredom and even stress easily occurs so that it interferes with the success of the DM treatment program [14]. The environment described can be as a stressor (stimulus), the environment as a stimulus can be both internal and external. Internal stimulus is a state of mental processes in the human body such as experience, emotional ability, personality.

 While external stimuli include physical, chemical, psychological that a person receives as a threat [6]. Aspects of resilience include emotional regulation. This emotional regulation is the ability to remain calm even in a depressed position. The emotions felt by a person tend to influence the condition of that person [11].

According to Stuart [1] a person's coping mechanisms are influenced by an assessment of stress and coping sources. Coping mechanisms are the way a person handles situations against stress determined by himself or herself including physical health, positive beliefs, problem-solving skills, social skills, social support. In line with Stuart, coping mechanisms are efforts directed at managing stress, including direct problem solving and defense mechanisms in self-protection. Divided into innate coping mechanisms (genetic possessed) and learned obtained through the process of learning and learning obtained through the process of learning and experience in everyday life.

## CONCLUSION

## In this study, the results obtained in the analysis of the Wilcoxon Statistical Test, the value of Asymp.Sig (2-tailed) was 0.114. so that "H0 is accepted" i.e. "there is no difference between giving DM Gymnastics before and after to the resilience and stress level of DM sufferers". DM sufferers who are able to adapt to a healthy lifestyle according to the DM pillars can provide resilient conditions and stress levels, besides that it is also influenced by social support factors, cognitive skills and psychological resources.

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