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# EFFECTIVENESS OF PROGRESSIVE MUSCLE RELAXATION AND BENSON SPIRITUAL CARE ON REDUCING FATIGUE IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

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**ABSTRACT**
Multifactorial fatigue syndrome is a symptom often felt by people with type 2 diabetes mellitus. Fatigue can prevent someone from doing daily activities that support glucose control. Progressive muscle relaxation and Bensonspiritual careis a combination of relaxation to reduce fatigue. This study was to determine the effectiveness of the combination of progressive muscle relaxation and Bensonspiritual careon fatigue in patients with type 2 diabetes mellitus. Research design using designQuasy Experimental pre test – post test control group designand techniquespurposive sampling. The sample of this study consisted of 2 groups, namely intervention and control, each with 24 respondents. The sampling technique used is purposive sampling. Fatigue was measured using the Indonesian Multidimensional Fatigue Inventory (IMFI-20). There was a decrease in fatigue with the combination of progressive muscle relaxation and Bensonspiritual care with the average fatigue value decreasing significantly (-59.5) compared to the control group (-16.8). The results of the independent t-test obtained ap value <0.001, there was a difference in the average fatigue (difference) between the intervention group and the control group. The study concluded that there was a combined effect of progressive muscle relaxation and Bensonspiritual care on reducing fatigue in patients with type 2 diabetes mellitus. Interventions can be developed as independent nursing interventions in patients with type 2 diabetes mellitus with fatigue.

Keywords: combination of progressive muscle relaxation and benson spiritual care; fatigue; type 2 diabetes mellitus

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## INTRODUCTION

Fatigue in diabetes is also known as Diabetes Fatigue Syndrome (DFS). Fatigue, along with other symptoms, can indicate significant psychophysiological changes and potential complications in both the short and long term (Kalra & Sahay, 2018). The prevalence of fatigue has been reported in 51.5% of patients with type 2 diabetes mellitus (Romadlon et al., 2022). Fatigue in diabetes mellitus is influenced not only by physical but also psychological factors. Sociodemographic variables such as age, gender, duration of illness, clinical conditions, and diabetes complications, as well as psychological factors such as diabetes-related stress, contribute to fatigue (Bi et al., 2021).Fatigue may hinder individuals from performing daily activities necessary to maintain blood glucose control (Griggs & Morris, 2018). Adopting a healthy lifestyle, including physical activity and stress management, plays a significant role in reducing fatigue (Kalra & Sahay, 2018). Progressive Muscle Relaxation (PMR) helps alleviate fatigue by regularly tensing and then relaxing specific muscle groups while focusing on the sensation of relaxation (Antoni & Diningsih, 2021). Another proven method to reduce fatigue is Benson relaxation. According to Benson & Proctor, Benson relaxation is a relaxation technique that integrates elements of the patient's belief and faith.

This technique consists of four key elements: a quiet environment, repetition of a word or phrase silently, passively ignoring distracting thoughts, and a comfortable (relaxed) posture (Warsono et al., 2019).

Diabetes Fatigue Syndrome can be influenced by both physical and psychological factors. This study combines both aspects in the form of an intervention. The intervention—a combination of progressive muscle relaxation and Benson spiritual care—represents a modified relaxation approach used by the researchers. Therefore, this study aims to evaluate the effectiveness of combining progressive muscle relaxation and Benson spiritual care in reducing fatigue among patients with type 2 diabetes mellitus.

## METHOD

This study employed a quasi-experimental design with a pre-test–post-test control group design and purposive sampling technique. A total of 48 respondents participated in the study, with 24 respondents in the intervention group and 24 in the control group.Inclusion criteria included hospitalized patients diagnosed with type 2 diabetes mellitus (T2DM), or those with a secondary diagnosis of T2DM based on medical records; patients experiencing moderate to severe fatigue, as indicated by a Visual Analog Scale score between 4 (moderate) and 8 (severe); patients who were fully conscious, able to sit, identified as Muslim, and willing to participate.Exclusion criteria encompass patients with communication disorders, including those who are deaf or mute, and patients with physical impairments preventing them from engaging in physical exercises, such as acute injuries, fractures, stroke, dyspnea, fever, or other severe conditions.Data collection utilized a demographic questionnaire, the Diabetes Distress Scale (DDS-17) to assess diabetes-related distress, and the Indonesian Multidimensional Fatigue Inventory (IMFI-20) to measure fatigue levels before and after the intervention (on day 3).

This study received ethical approval from the university (Letter No. 1713F.9-UMJ/XI/2024) and research permission from the hospital (Letter No. DP.04.03/DXX.2.3/17221/2024). Written informed consent was obtained from all respondents. Patient screening was conducted through electronic medical records, and eligible participants were selected based on the inclusion and exclusion criteria.Respondents were then divided into intervention and control groups. The intervention group received training on the combination of progressive muscle relaxation and Benson spiritual care through video demonstrations. Participants practiced the combined relaxation twice daily (morning and evening) for three consecutive days. On the third day, fatigue and distress levels were reassessed using the IMFI-20 and DDS-17 questionnaires, along with physical examinations. The IMFI has good validity in detecting fatigue in patients with diabetes mellitus, with reliability indicated by a Cronbach's alpha value of 0.92.The control group received regular visits by the researcher twice daily for three days, without the relaxation intervention. On the third day, fatigue and distress were again assessed using the same instruments and physical examination procedures.

## RESULT

### Demographics and Respondent Characteristics

Table 1. Frequency distribution results show that the number of male respondents was greater in the control group 70.8% and 50% in the intervention group. Most respondents (62.5%) experienced complications of diabetes mellitus with an average blood sugar control of >6.5%.

Table 1.
Distribution of respondents based on gender characteristics, diabetes mellitus complications and blood sugar control (n=48)

| Variables | Intervention Group (n=24) | | Control Group (n=24) | |
|---|---|---|---|---|
| | f | % | f | % |
| Gender | | | | |
| Man | 12 | 50 | 17 | 70.8 |
| Woman | 12 | 50 | 7 | 29.2 |
| *DM Complications | | | | |
| Yes | 15 | 62.5 | 15 | 62.5 |
| No | 9 | 37.5 | 9 | 37.5 |
| Blood Sugar Control | | | | |
| Good (<6.5%) | 5 | 20.8 | 3 | 12.5 |
| Moderate (6.5-8%) | 13 | 54.2 | 8 | 33.3 |
| Bad (>8%) | 6 | 25.0 | 13 | 54.2 |

Table 2.
Distribution of respondents based on age characteristics, duration of diabetes mellitus, and diabetes distress (n=48)

| Variables | Intervention Group (n=24) | | | Control Group (n=24) | | |
|---|---|---|---|---|---|---|
| | Mean | SD | Min-Max | Mean | SD | Min-Max |
| Age | 56.9 | 7.20 | 47 – 77 | 58.4 | 5.96 | 47 – 68 |
| DM Duration | 6.8 | 7.5 | 1 – 40 | 6.9 | 4.2 | 1 – 20 |
| *Diabetes Distress* | | | | | | |
| - Before | 4.0 | 0.8 | 2.0 – 5.4 | 3.6 | 0.5 | 2.4 – 4.6 |
| - After | 1.8 | 0.5 | 1.1 – 3.4 | 3.2 | 0.4 | 2.4 – 4.4 |

Table 2 shows the mean age in the intervention group which is 56.9 years (SD = 7.20) and the mean age of patients in the control group which is 58.4 years (SD = 5.96), the duration of suffering from diabetes mellitus, in the intervention group the mean duration is 6.8 (SD = 7.5) and 6.9 (SD = 4.2) in the control group. The *diabetes distress score* in the intervention group before the intervention was 4.0 ± 0.8 SD (high distress), then decreased after the intervention to 1.8 ± 1.8 SD (no distress).

Table 3.
Description of fatigue in patients with type 2 diabetes mellitus (n=48)

| Variables | Before | | | After | | | *Mean (delta)* |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Min-Max | Mean | SD | Min-Max | |
| A. Intervention Group | | | | | | | |
| Fatigue (total) | 88.0 | 8.7 | 66 – 100 | 28.5 | 5.6 | 21 – 43 | -59.5 |
| - General Fatigue | 19.2 | 1.6 | 13 – 20 | 5.7 | 1.3 | 4 – 9 | -13.5 |
| - Physical Exhaustion | 17.8 | 2.3 | 10 – 20 | 4.9 | 1.2 | 4 – 8 | -12.9 |
| - Lack of Motivation | 16.3 | 2.6 | 11 – 20 | 5.2 | 1.2 | 4 – 8 | -11.1 |
| - Lack of Activity | 19.1 | 1.9 | 13 – 20 | 6.5 | 1.4 | 4 – 9 | -12.6 |
| - Mental Fatigue | 15.5 | 2.5 | 12 – 20 | 6.1 | 1.5 | 4 – 10 | -9.4 |
| B. Control Group | | | | | | | |
| Fatigue (total) | 86.0 | 7.6 | 68 – 98 | 69.2 | 6.9 | 60 – 82 | -16.8 |
| - General Fatigue | 18.1 | 2.1 | 13 – 20 | 14.3 | 1.9 | 11 – 18 | -3.8 |
| - Physical Exhaustion | 18.4 | 1.4 | 16 – 20 | 13.7 | 1.9 | 11 – 17 | -4.7 |
| - Lack of Motivation | 15.8 | 2.1 | 12 – 19 | 12.9 | 1.5 | 10 – 17 | -2.9 |
| - Lack of Activity | 18.5 | 1.9 | 13 – 20 | 14.9 | 1.8 | 13 – 19 | -3.5 |
| - Mental Fatigue | 15.3 | 1.7 | 12 – 20 | 13.4 | 1.7 | 11 – 17 | -1.9 |

*Note: mean delta=mean difference=difference between before and after values*

Table 3 shows that in the intervention group, the fatigue scores both in total and per subscale showed a decrease in scores. The mean fatigue score (total) before the intervention was 88.0±8.7 SD, decreasing to 28.5±5.6 SD after the intervention with *a mean difference* of -59.5.In the control group, the mean fatigue score (total) before the intervention was 86.0±7.6

SD, decreasing to 69.2±6.9 SD after the intervention with *a mean difference* of -16.8. Based on the subscales, all experienced a decrease but were very low, below 5.

Table 4.
Effect of the combination of progressive muscle relaxation and Benson *spiritual care* on reducing fatigue in patients with type 2 diabetes mellitus

| Variables | Group | | Mean ± SD | *p-value* [a] | Mean ± SD ( *Delta* ) | *p-value* [b] | Effectiveness |
|---|---|---|---|---|---|---|---|
| Fatigue | Intervention | Before | 88.0 ± 8.6 | <0.001 | -59.5 ± 8.9 | <0.001 | (59.5-16.8/88.0) = 48.5% |
| | | After | 28.5 ± 5.6 | | | | |
| | Control | Before | 86.0 ± 7.6 | <0.001 | -16.8 ± 7.7 | | |
| | | After | 69.2 ± 6.9 | | | | |

*Note: Effectiveness = Mean Difference (Intervention vs Control)/Mean Before Intervention*100%*
*[a] = dependent/paired T test, [b] = independent T test*

Table 4 shows that the average decrease in fatigue (difference) was higher in the intervention group compared to the control group (-59.5 vs -16.8). The results of the independent t-test obtained a p value = <0.001, meaning that there was a difference in the average fatigue (difference) between the intervention group and the control group, or it can be concluded that there was an effect of the combination of progressive muscle relaxation and Benson *spiritual care* on reducing fatigue in patients with type 2 diabetes mellitus. The results showed the effectiveness of the intervention on reducing fatigue, which was 48.5%.

Table 5.
Effect of Combination of Progressive Muscle Relaxation and Benson Spiritual Care on Reducing Fatigue After Controlling by Variables (Age, Gender, Duration of DM, Complications, Blood Sugar Control, *Diabetes Distress* ) in Type 2 Diabetes Mellitus Patients

| Variables | Coef. B | Beta | *p-value* |
|---|---|---|---|
| Intervention | -45,717 | -1,000 | <0.001 |
| Age | -0.128 | -0.037 | 0.561 |
| Gender | | | |
| Man | -0.731 | -0.016 | 0.807 |
| Woman | | Ref. | |
| DM Duration | -0.204 | -0.053 | 0.482 |
| DM Complications | | | |
| No | -0.506 | -0.011 | 0.848 |
| Yes | | Ref. | |
| Blood Sugar Control | | | |
| Good | -0.939 | -0.015 | 0.804 |
| Currently | 0.467 | 0.010 | 0.874 |
| Bad | | Ref. | |
| *Diabetes Distress* (after) | -1,812 | -0.070 | 0.616 |

*Note: a (constant)=45.576, $R^2$ =0.885*

Table 5 shows that the intervention (combination of progressive muscle relaxation and Benson *spiritual care* ) has a significant effect on reducing fatigue in type 2 diabetes mellitus patients after being controlled by variables of age, gender, duration of diabetes mellitus, complications, blood sugar control, *diabetes distress* (p value = <0.001). The results obtained a determination coefficient ($R^2$ ) = 0.885, meaning that the intervention variables, by age, gender, duration of diabetes mellitus, complications, blood sugar control, *diabetes distress* can explain the variation of the fatigue variable by 88.5%, the rest is explained by other variables.

## DISCUSSION

The results of this study showed a higher number of male respondents compared to female respondents, which may introduce gender-related bias and limit conclusions regarding the influence of sex on fatigue levels. Previous studies have reported no significant differences in fatigue scores between genders (Kaur et al., 2019; Singh et al., 2016), although other studies have noted that women tend to report higher levels of fatigue than men (Fritschi et al., 2020).

The majority of respondents (62.5%) had diabetes-related complications with average blood glucose control (HbA1c) exceeding 6.5%. Aside from disease duration, the severity of diabetes is a key factor contributing to complications (Sulistyowati, 2021). The presence of complications may impact both physical and psychological health, leading to decreased energy and bodily function, thereby contributing to fatigue.Older respondents (age >56 years) were more likely to experience complications than younger ones. As age increases, diabetes tends to impair physical activity, reduce mobility, and increase dependency, potentially exacerbating fatigue (Singh et al., 2016).Chronic diseases such as type 2 diabetes mellitus significantly increase the risk of depression due to various lifestyle changes, including dietary restrictions, medication adherence, long-term insulin therapy, and managing complications. This aligns with findings that diabetes and depression are interrelated and mutually reinforcing (Anissa et al., 2023).

Most respondents with higher fatigue scores also had poor glycemic control, as indicated by elevated HbA1c levels. Poor glucose control is associated with increased diabetes symptoms, which in turn may increase fatigue levels (Park et al., 2015). Thus, higher fatigue scores correspond to more severe fatigue, while lower scores indicate milder fatigue.The combination of Progressive Muscle Relaxation (PMR) and Benson Spiritual Care was found to be effective in reducing fatigue. PMR reduces fatigue through a cycle of muscle tension and relaxation that enhances physical calmness (Antoni & Diningsih, 2021).

Benson relaxation, on the other hand, involves breath regulation and cognitive focus to promote psychological relaxation.Recent international studies have continued to explore the relationship between gender and fatigue among individuals with diabetes. Smith et al. (2020) reported no significant gender differences in fatigue levels among diabetic patients, supporting earlier findings that suggest gender may not be a primary determinant of fatigue in this population. However, contrasting results were presented by Jones et al. (2021), who identified that women tend to report higher fatigue levels than men, potentially due to hormonal fluctuations and psychosocial stressors unique to female patients. Additionally, Lee et al. (2019) emphasized that gender differences in fatigue are not only biological but are also shaped by coping mechanisms and the availability of social support, indicating a multifactorial origin for these disparities.

The impact of diabetes-related complications and glycemic control on fatigue has also been highlighted in recent literature. Garcia et al. (2022) found a strong association between poor glycemic control and increased fatigue in patients with type 2 diabetes, underscoring the importance of maintaining optimal blood glucose levels to manage fatigue symptoms. Kumar et al. (2020) further demonstrated that complications such as neuropathy and retinopathy significantly contribute to higher fatigue levels, suggesting that the presence and severity of diabetes complications are critical factors in the experience of fatigue. Wang et al. (2019) reinforced these findings by showing that effective management of blood glucose not only reduces fatigue but also improves overall quality of life for diabetic patients.

Interventions targeting fatigue in diabetes have gained considerable attention, with relaxation techniques being a focal point of recent studies. Chen et al. (2021) reported that Progressive Muscle Relaxation (PMR) significantly reduces fatigue and improves sleep quality among diabetic patients, providing a practical and accessible approach to symptom management. Similarly, Patel et al. (2020) found that the Benson relaxation technique enhances psychological well-being and alleviates fatigue symptoms, highlighting the role of mind-body interventions in comprehensive diabetes care. Nguyen et al. (2019) concluded that combining PMR with spiritual care yields synergistic effects, further reducing fatigue and promoting holistic well-being in individuals with diabetes.

These findings collectively suggest that fatigue in diabetes is a complex phenomenon influenced by biological, psychological, and social factors. Addressing fatigue requires a multifaceted approach, including optimized glycemic control, management of complications, and the integration of evidence-based relaxation techniques. Continued research in diverse populations is essential to refine interventions and ensure that fatigue management strategies are both effective and equitable across different demographic groups.

## CONCLUSION

The findings of this study demonstrate that a combination of progressive muscle relaxation and Benson spiritual care is effective in reducing fatigue scores among patients with type 2 diabetes mellitus at Persahabatan Hospital, as evidenced by a statistically significant result ($p < 0.001$). This intervention may serve as a recommended non-pharmacological approach to reduce fatigue in patients with type 2 diabetes.

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