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The effect of progressive muscle relaxation on the psychological burden of caregivers of patients with diabetes mellitus

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Abstract

Background: Type 2 Diabetes Mellitus (DM) is a chronic disease that not only affects patients but also places a significant psychological burden on their families as caregivers. This burden can take the form of stress, anxiety, depression, physical exhaustion, and decreased quality of life.
Purpose: To determine the Progressive Muscle Relaxation (PMR) technique in reducing the psychological burden on caregivers of patients with DM type 2.
Method: A descriptive qualitative approach, specifically focusing on exploratory study. The study took place April 2025, in Batutulis, Bogor. Using total sampling 2 participants were selected, contributor informant inquired Mr. W as caregiver and Mrs. U patients with diabetes mellitus type 2. Data collection in this study was done through triangulation, which combines several data sources, methods, and theories to increase the validity of the results. For data collection, it was conducted using indepth interviews were conducted with open-ended questions with questionnaire. The data were analysed using thematic analysis technique to identify important information and understand the core meaning of each data.
Results: There was a decrease in psychological burden after the PMR intervention, as evidenced by a decrease in family questionnaire scores. Data collection was conducted through interviews, observation, and documentation.
Conclusion: Progressive Muscle Relaxation has been shown to reduce the psychological burden on caregivers of patients with chronic illnesses, including diabetes. This intervention can be used as a supporting strategy for community nursing services to improve caregiver mental well-being.

Keywords: Caregivers; Diabetes Mellitus; Progressive Muscle Relaxation; Psychological Burden.

INTRODUCTION

Diabetes Mellitus (DM) is a chronic metabolic disease characterized by elevated blood glucose levels, which over the long term can cause serious damage to the heart, blood vessels, eyes, kidneys, and nerves. Type 2 DM causes the body to become insulin resistant or not produce enough insulin. Type 2 DM is most common in adults. In the last three decades, the prevalence of type 2 DM has increased significantly in all countries, regardless of income level (Jane, Olatunji, Bamiso, Kola, Ayodele, & Ideraoluwa, 2019). Type 1 DM is a chronic condition in which the pancreas produces little or no insulin. Type 1 DM is also called juvenile diabetes or insulin-dependent diabetes. Approximately 830 million people worldwide have diabetes, most of whom live in low- and middle-income countries. More than half of people with diabetes do not receive treatment (Meiliana, Hakim, Hayati, Kritstianingrum, Kartika, & Sandi, 2024).

Data from the International Diabetes Federation (IDF) in 2022 shows that there are 8.75 million individuals with Type 1 DM, and approximately one-fifth of them, or 1.9 million, come from low- or lower-middle-income countries. Based on the total population of Type 1 DM in the world, 1.52 million or approximately 17% are under 20 years old, 5.56

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million or 64% are aged 20-59 years, and approximately 1.67 million or 19.9% are over 60 years old. It is estimated that the number of Type 1 DM sufferers in Indonesia is 41.817 people, namely 13.311 under 20 years old, 26,781 between 20-50 years old, and 1.721 over 60 years old (Singh, Shadangi, Gupta, & Rana, 2025). The 2023 Indonesian Health Survey (SKI) reported that type 2 diabetes was more common than type 1 diabetes in both the productive age group (18-59 years old) and the elderly (over 60 years old). Type 2 diabetes was found in 52.1% of the productive age group and in 48.9% of the elderly. The prevalence of type 1 diabetes was 15.5% in the productive age group and 17.8% in the elderly (Sari, Wahid, & Ambarsari, 2025).

Type 2 Diabetes Mellitus (DM) is a chronic disease that requires long-term care. This impacts not only the patient but also the family as the primary caregiver. Research shows that caregivers or families often experience physical burden due to daily care activities, psychological burdens such as stress, anxiety, and depression, economic pressure due to increased medical costs, and social isolation due to reduced personal time. Other research shows that high caregiver burden is inversely proportional to the patient's health status. If caregivers feel burdened, the quality of care can decline, impacting the patient's own health (Kristaningrum, Ramadhani, Hayati, & Setyoadi, 2021). Approximately 70.6% of families experience moderate psychological burden, and 22.5% experience severe burden due to long caregiving time, lack of support, and inadequate information (Adianta & Wardianti, 2018).

A study conducted in Nigeria based on the Caregiver Burden Level (ZBI) showed that 42% experienced light or no burden, 47% experienced light to moderate burden, 8% experienced moderate to severe burden, 3% experienced severe burden, and 35% experienced psychological distress (GHQ-12 > 3). Psychological distress is significantly correlated with caregiver burden (Młynarska, Czarnik, Dzieża, Jędraszak, Majchrowicz, & Prusinowski 2025). The role of mental health nurses in identifying caregiver burden and providing psychosocial support is urgently needed. The effect of Progressive Muscle Relaxation on levels of anxiety, stress, and depression has been widely studied. The results showed that relaxation techniques such as deep breathing and Progressive Muscle Relaxation significantly reduced stress, depression, and anxiety in parents of children with Type 1 DM (Pateraki, Mantzourani, Darvyri, Alexopoulos, Varvogli, Mamoulakis, & Chrousos, 2015).

RESEARCH METHOD

A descriptive qualitative approach, specifically focusing on exploratory study. The study took place April 2025, in Batutulis, Bogor. Using total sampling 2 participants were selected, contributor informant inquired Mr. W as caregiver and Mrs. U patients with diabetes mellitus type 2.

Data collection in this study was done through triangulation, which combines several data sources, methods, and theories to increase the validity of the results. For data collection, it was conducted using indepth interviews were conducted with open-ended questions with questionnaire.

The intervention in this study was the application of progressive muscle relaxation techniques, which were carried out in two sessions with a one-week interval. In the first session, the researcher explained the objectives and benefits of progressive muscle relaxation techniques, followed by a demonstration of how to perform the techniques. The intervention focused on facial muscle relaxation, including the forehead and eye muscles, cheek muscles, mouth muscles, and jaw muscles. Mrs. W was then asked to practice the progressive muscle relaxation technique again with the guidance of the researcher to ensure the accuracy of the implementation. During the one-week interval after the first session, Mrs. W was expected to practice the progressive muscle relaxation technique independently according to the instructions given. In the second session, the researcher evaluated the independent practice that had been carried out and provided reinforcement regarding the progressive muscle relaxation technique.

A family questionnaire was used to measure caregivers' emotional burden prior to the intervention. The questionnaire consisted of 20 statements on a four-point Likert scale, with a score of 1 for “Never/Very Rarely,” a score of 2 for “Rarely,” a score of 3 for “Often,” and a score of 4 for “Very Often.” The total score was obtained by summing all statement items, where a higher score indicated a

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greater level of psychological burden on caregivers. Initial measurement results showed a family questionnaire score of 37. After the entire intervention series was completed, the family questionnaire was administered again to assess the effectiveness of progressive muscle relaxation techniques on caregivers' emotional burden.

The caregiver's emotional mental health was measured using the Self Reporting Questionnaire (SRQ-20), which consists of 20 items with “Yes” and “No” answer options. ‘Yes’ answers were given a score of 1 and “No” answers were given a score of 0, so the total score ranged from 0–20, where a higher score indicated more symptoms of emotional mental disorders.

The data were analysed using thematic analysis technique to identify important information and understand the core meaning of each data.

RESEARCH RESULTS

Table 1. The result of Progressive Muscle Relaxation Intervention

Variable	Before Intervention	After Intervension
Family Questionnaire	37	24
SRQ-20	5	1
Progressive Muscle Relaxation	0	15

Based on Table 1, the family questionnaire score decreased from 37 before the intervention to 24 after the intervention, indicating a decrease in the caregiver's emotional burden. The SRQ-20 score also decreased from 5 to 1, indicating an improvement in emotional mental health. In addition, the frequency of progressive muscle relaxation practice increased from 0 to 15 times. These results indicate that progressive muscle relaxation intervention has a positive impact on the psychological condition of caregivers.

DISCUSSION

Based on the results of in-depth interviews prior to intervention, it was found that Mrs. W had received health education about diabetes mellitus (DM), including understanding of the disease and healthy eating patterns in caring for family members with DM. So far, Mrs. W has coped with her anxiety by talking to her sister, which indicates an adaptive coping mechanism. However, Mrs. W was not yet aware of specific techniques to address the psychological distress she was experiencing, such as tension and anxiety, through deep breathing or progressive muscle relaxation techniques. The results of an in-depth interview after the intervention showed a decrease in the family's psychological burden, marked by a decrease in the family questionnaire score to 24 and the SRQ score to 1. In addition, Mrs. W was able to perform progressive muscle relaxation techniques independently.

The findings of this study indicate that although Mrs. W had received adequate health education regarding diabetes mellitus and demonstrated adaptive coping by seeking emotional support from her sister, she lacked specific skills to manage psychological distress such as tension and anxiety (Auliani & Sholichah, 2020). This suggests that informational support alone is insufficient to address the emotional challenges experienced by caregivers. Caregivers often require practical coping strategies to effectively regulate stress responses associated with long-term caregiving roles, particularly when caring for family members with chronic illnesses such as diabetes mellitus (Yadav, Kaushik, & Kaushik, 2021).

Following the intervention, a notable reduction in psychological burden was observed, as reflected by decreased family questionnaire and SRQ scores, alongside Mrs. W’s ability to independently perform progressive muscle relaxation. These findings support existing evidence that progressive muscle relaxation is an effective non-pharmacological intervention for reducing psychological distress among caregivers (Tsakona, Tsiroukidou, Vamvakis, Papagianni, Anna, Onoufrios, & Hristara, 2019). Promoting physiological relaxation and enhancing self-regulation, this technique can strengthen

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caregivers' coping capacity and contribute to improved mental health, highlighting the important role of nurses in providing structured psychosocial interventions for family caregivers (Turan, Ozer, & Demir, 2025).

Caregivers face several physical, psychological, and social stressors that negatively impact their health and quality of life. Caregiver burden encompasses all responses, whether physical, emotional, or financial. Helping others with physical or mental disabilities represents a significant change and demand for caregivers (Shareef, Murtaza, Fatima, Aqib, Manzoor, Malik, & Hussain, 2025). The Caregiver Burden Inventory differentiates caregiver burden into Objective Burden and Subjective Burden. Objective burden refers to the caregiver's time and commitment to daily caregiving activities. Subjective burden includes daily feelings of deprivation, fatigue, physical problems, problems with socialization and participation, and caregivers' feelings toward the care recipient (Dewi, Agustina, Budhiana, & Fatmala, 2021). The study found that the highest burden for families with diabetes was iatrogenic (90.2%), caused by a lack of information about blood sugar control, carbohydrate intake, and a general understanding of diabetes. objective burden (66.7%) is mainly related to the cost of care and difficulty in managing diet, and subjective burden (70.6% moderate burden) is related to emotional stress such as sadness and worry about the patient's condition (Xie, Qi, Zhang, Wang, Meng, Aikepaer, & Gao, 2025).

Research reports that the caregiver needs of patients with lower limb amputations include self-related needs and role-related needs. Self-related needs encompass mental and psychological health needs such as traumatic stress, grief, isolation, and anxiety; physical health needs such as physical exhaustion from caring for the patient; and general health and well-being (Capaci, Asiret, & Kapucu, 2022). Role-related needs include supportive care, namely practical assistance with caring for the patient at home; social support such as social networks to prevent caregiver burnout; and education and information such as communication with healthcare professionals and training in caring for amputee patients (Rodrigues, Silva, Castanheira, Carvalho, & Pinto, 2024). Research has shown that caregiver burden is a determining factor in caregiver quality of life (QoL). Caregivers of older adults with hip fractures experience multidimensional burdens such as fatigue, emotional distress, and role conflict (Pereira, Pedras, Louro, Lopes, & Vilaca, 2023).

Progressive Muscle Relaxation (PMR) can reduce caregiver burden and depression levels in caregivers of elderly patients, but PMR does not affect caregiver satisfaction. The results showed that anxiety, stress, depression, and caregiver burden in dementia patients decreased after PMR practice (Anna, Wiwik, Ika, & Nurul, 2018). PMR is a non-pharmacological intervention without side effects that can be used as a valuable tool to improve mental health and reduce the burden of dementia caregivers (Baykal & Bilgic, 2024). Caregivers in the intervention group experienced a significant decrease in caregiver burden, namely a decrease in the Zarit Caregiver Burden Scale score and a decrease in depression with a decrease in the Beck Depression Scale score after practicing progressive muscle relaxation (Yilmaz, Asiret, Cetinkaya, Oludag, & Kapucu, 2019).

CONCLUSION

This study concludes that addressing both personal and role-related caregiver needs is essential, particularly physical fatigue and psychological problems such as anxiety and psychological burden. Nurses play a key role in identifying these needs and providing comprehensive support. Progressive Muscle Relaxation is an effective non-pharmacological intervention that helps reduce caregivers' psychological burden and improve mental health.

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