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*Article*

# The Effect of Slow Deep Breathing Combined with Classical Music on Anxiety in Elderly Patients with Diabetes Mellitus: A Gerontological Nursing Case Study

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**ABSTRACT**

**Background:** Diabetes mellitus (DM) is a chronic metabolic disorder characterized by persistent hyperglycemia. Global prevalence is rising, with an estimated 589 million cases in 2024 and a projected 853 million by 2050. Beyond physical health, DM often leads to psychological complications. Anxiety is 20% more prevalent in diabetic patients than in the general population, often resulting in poor glycemic control and a cycle of metabolic decline.
**Objectives:** This study aims to analyze the effectiveness of combining slow deep breathing therapy with classical music as a non-pharmacological nursing intervention to manage anxiety in elderly patients with DM at Puskesmas Tabanan I.
**Method:** A descriptive case study design was used, following the five-stage nursing process: assessment, diagnosis, planning, implementation, and evaluation. Three patients (aged 65–79 years) with a nursing diagnosis of Anxiety (SDKI D.0080) participated from December 5–7, 2025. The intervention consisted of a 60-minute session held once daily for three days. Anxiety levels were measured using the Indonesian Nursing Outcome Standard (SLKI L.09093).
**Results:** After three sessions, all patients showed significant reductions in anxiety. Subjective findings included decreased worry and improved relaxation. Objective indicators showed reduced restlessness, less muscle tension, and the normalization of respiratory and heart rates. Additionally, patients reported higher confidence in managing their symptoms.
**Conclusion:** Combining slow deep breathing with classical music is an effective, safe, and feasible non-pharmacological intervention for reducing anxiety in elderly diabetic patients. This approach is recommended as a complementary therapy in routine gerontological nursing care.

**Keywords:** Diabetes mellitus, Anxiety, Slow deep breathing, Classical music, Gerontological nursing

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## INTRODUCTION

The elderly population carries a disproportionate burden of chronic non-communicable diseases due to age-related physiological decline, including reduced insulin sensitivity and progressive impairment of metabolic regulation. Among these conditions, diabetes mellitus (DM) is particularly prevalent and has profound consequences for both physical health and psychological wellbeing (Sunaringsih & Wardojo, 2024).

Globally, DM represents a major and growing public health challenge. The International Diabetes Federation (IDF) Diabetes Atlas, 11th edition (2025), reported that approximately 589 million adults aged 20–79 years were living with diabetes in 2024, with projections rising to 853 million by 2050. In Indonesia, national health

survey data (Riskesdas, 2018) estimated a prevalence of 2.0%, affecting more than one million individuals. In Bali Province, the Bali Provincial Health Office (2024) documented 50,845 diagnosed cases, with Tabanan Regency alone accounting for 5,525 cases. At the primary care level, UPTD Puskesmas Tabanan I recorded 202 elderly patients with diabetes between January and October 2025.

Often referred to as a “silent killer,” DM progresses insidiously while generating a complex burden of physical, psychological, social, and economic complications. Anxiety is among the most common psychological sequelae, with prevalence rates estimated to be 20% higher in diabetic patients compared to non-diabetic individuals (Yuliputra, 2022). Anxiety not only diminishes quality of life but also disrupts glycaemic control through neuroendocrine mechanisms. Elevated cortisol and counterregulatory hormone secretion exacerbate hyperglycaemia, creating a self-reinforcing cycle of metabolic dysregulation and psychological distress (Khadlonah, 2023).

Conventional management of anxiety in DM relies heavily on pharmacological agents. However, these treatments carry risks of dependency, cognitive side effects, and drug interactions, particularly in elderly patients who often face polypharmacy. Non-pharmacological interventions therefore represent an important adjunct in gerontological nursing care. Slow deep breathing therapy is a controlled respiratory technique that activates the parasympathetic nervous system, reduces sympathoadrenal activity, lowers cortisol secretion, and promotes relaxation. This physiological response alleviates anxiety and contributes to improved glycaemic stability (Anggraini et al., 2021; Warsono & Yanto, 2020).

Classical music therapy provides an additional pathway for anxiety reduction by modulating the hypothalamic-pituitary-adrenal axis. Auditory stimulation from classical music suppresses cortisol release, fostering a calm and focused mental state (Dolang et al., 2022). When combined, slow deep breathing and classical music therapy produce a synergistic relaxation response, engaging both respiratory and auditory neuromodulatory pathways to address the physiological and psychological dimensions of anxiety comprehensively.

Although evidence supports the independent use of each modality, their combined application within structured gerontological nursing care remains underexplored in Indonesia, particularly at the primary care level. This case study was therefore conducted to evaluate the feasibility and effectiveness of integrating slow deep breathing and classical music therapy for elderly patients with diabetes mellitus and anxiety at UPTD Puskesmas Tabanan I.

## METHODS

### Study Design

This study employed a descriptive case study design, structured according to the five stages of the nursing process: assessment, nursing diagnosis, care planning, implementation, and evaluation. This design was chosen to provide a detailed, patient-centered account of nursing interventions and outcomes in a real-world primary care setting.

**Setting and Participants**

The study was conducted at UPTD Puskesmas Tabanan I, Tabanan Regency, Bali, Indonesia. The facility serves a catchment area with 3,626 registered elderly residents, of whom 202 were diagnosed with diabetes mellitus during the study period (January–October 2025). Three elderly patients were purposively selected based on the following inclusion criteria: age ≥60 years, confirmed diagnosis of diabetes mellitus with ongoing outpatient care, nursing diagnosis of anxiety (SDKI D.0080) confirmed through structured gerontological assessment, absence of contraindications to breathing exercises or music therapy (e.g., severe respiratory disease, deafness), and willingness to participate. Patients with severe cognitive impairment were excluded.

1. Patient 1 (Ny.S): A 79-year-old female with a one-year history of diabetes and irregular medication adherence, presenting with anxiety about disease complications. Vital signs: BP 120/80 mmHg, HR 80 bpm, RR 20/min, T 36.0°C. She reported dizziness, anorexia, insomnia, and fear of disease progression, appearing restless and tense.
2. Patient 2 (Ny.N): A 76-year-old female with a two-month history of diabetes, presenting with anxiety due to lack of disease knowledge. Vital signs: BP 110/80 mmHg, HR 85 bpm, RR 18/min, T 36.5°C. She reported consuming sweetened foods, was unaware of hypo/hyperglycaemia warning signs, and appeared confused, asking repeated questions.
3. Patient 3 (Tn.R): A 65-year-old male with persistent anxiety and worry about his illness. Vital signs: BP 130/90 mmHg, HR 90 bpm, RR 18/min, T 36.2°C. He appeared pale, restless, and sighed frequently. Physical examination was unremarkable in all three patients, with no diabetic wounds and parameters within normal limits.

**Nursing Diagnosis**

Based on gerontological nursing assessment, all three patients were diagnosed with anxiety related to inadequate health information exposure, evidenced by subjective reports of worry and fear, and objective findings of restlessness, tension, and altered physiological parameters (SDKI D.0080).

**Intervention**

Interventions were guided by the Indonesian Nursing Intervention Standard for Anxiety Reduction (SIKI I.09314). The evidence-based practice component comprised combined slow deep breathing and classical music therapy. The protocol included:

1. Positioning the patient comfortably in a seated, upright position.
2. Playing selected classical music at a comfortable volume.
3. Instructing the patient to place both hands on the abdomen.
4. Guiding slow nasal inhalation over ~3 seconds, with abdominal expansion.
5. Holding the breath for ~3 seconds while listening to the music.
6. Directing pursed-lip exhalation through the mouth over ~6 seconds, synchronized with the music rhythm.
7. Repeating the cycle for 15 minutes.

Each session was embedded within a 60-minute nursing visit that also included assessment, health education, and evaluation. The intervention was delivered once

daily over three consecutive home visits (5–7 December 2025). The protocol was consistent with recommendations by Octiara Lestari et al. (2025) and Ummami & Nasution (2025), which support 5–15 minutes of combined therapy per session for three consecutive days to achieve significant anxiety reduction.

**Outcome Measurement**

Anxiety outcomes were evaluated using the Indonesian Nursing Outcome Standard (SLKI) for Anxiety Level (L.09093). Indicators included subjective reports of worry, fear, and tension; objective signs such as restlessness, pallor, and sighing; and physiological parameters (blood pressure, heart rate, respiratory rate). Evaluations were conducted at the end of each session using SOAP documentation.

**Ethical Considerations**

Verbal informed consent was obtained and documented from all participants prior to the intervention. Patient anonymity was maintained through the use of initials. The study adhered to ethical principles outlined in the nursing professional code of conduct endorsed by the Indonesian National Nurses Association (PPNI).

## RESULTS

**Assessment and Diagnosis**

All three participants were elderly individuals (ages 65–79 years) living in the community under the care of UPTD Puskesmas Tabanan I. Although they differed in the duration of diabetes diagnosis (ranging from two months to one year) and in their specific anxiety triggers, all shared a common nursing diagnosis: Anxiety related to inadequate health information exposure (SDKI D.0080). This diagnosis highlights that their anxiety was primarily linked to insufficient understanding of diabetes management, disease complications, and self-care strategies, rather than a generalized anxiety disorder.

The anxiety profiles varied across patients. Ny.S exhibited somatic manifestations such as insomnia, anorexia, and dizziness, accompanied by catastrophic appraisals of her health. Ny.N presented with cognitive anxiety, characterized by confusion and repeated questioning due to limited knowledge of diabetes self-management. Tn.R demonstrated a mixed profile, with somatic signs (pallor, sighing, tachycardia) and behavioral symptoms including persistent worry and difficulty controlling anxious thoughts. This heterogeneity underscores the multidimensional nature of anxiety in elderly patients with diabetes and emphasizes the need for holistic nursing interventions tailored to individual symptom patterns.

**Implementation and Evaluation**

Table 1 summarizes patient characteristics, baseline findings, and intervention outcomes across three sessions. By the conclusion of the three-session intervention, all patients demonstrated measurable improvement across both subjective and objective indicators of anxiety. Ny.S reported reduced fear and worry, her facial tension eased, and she described improved sleep initiation. Ny.N showed marked reductions in confusion and repetitive questioning, and she was able to articulate basic principles of glycaemic self-management. Tn.R's pallor resolved, his respiratory pattern normalized, and he reported a greater sense of control over his anxiety episodes.

Vital sign trajectories across sessions were generally positive, with reductions in heart rate and respiratory rate consistent with parasympathetic activation. These improvements suggest that the combined intervention of slow deep breathing and classical music therapy was effective in alleviating anxiety symptoms and enhancing self-management capacity among elderly patients with diabetes mellitus.

**Table 1.** Summary of Patient Characteristics and Anxiety Outcomes Across Three Sessions

| Patient | Age/Sex | Baseline BP (mmHg) | Anxiety Trigger | Outcome after 3 Sessions |
|---|---|---|---|---|
| **Ny.S** | 79 / Female | 120/80 | Fear of complications; irregular medication adherence | Reduced restlessness and tension; improved sleep initiation; patient expressed feeling more relaxed |
| **Ny.N** | 76 / Female | 110/80 | Knowledge deficit regarding DM self-management | Decreased confusion; demonstrated basic self-management knowledge; less frequent anxious questioning |
| **Tn.R** | 65 / Male | 130/90 | Inability to control worry about illness trajectory | Pallor resolved; HR normalized (from 90 to 80 bpm); patient reported improved ability to |

*BP: blood pressure; HR: heart rate; bpm: beats per minute*

## DISCUSSION

### Anxiety in Elderly Patients with Diabetes Mellitus

The nursing diagnosis of Anxiety (SDKI D.0080) identified in all three patients reflects the well-documented psychological burden of diabetes mellitus (DM) in elderly populations. Anxiety complicates DM management through multiple mechanisms. Heightened sympathoadrenal activity increases catecholamine and cortisol secretion, which in turn stimulates hepatic gluconeogenesis and reduces insulin-mediated glucose uptake, thereby worsening hyperglycaemia (Yuliputra, 2022). Anxiety also undermines treatment adherence and self-care capacity, leading to poorer glycaemic outcomes and greater risk of long-term complications (Khadlonah, 2023). These dynamics were evident in the present case series, where anxiety both resulted from and contributed to suboptimal diabetes self-management.

### Mechanism of Slow Deep Breathing

Slow deep breathing therapy exerts anxiolytic effects primarily through vagal activation. By prolonging expiration and reducing respiratory frequency to approximately six cycles per minute, the technique enhances baroreceptor stimulation and parasympathetic tone, thereby suppressing sympathetic “fight-or-flight” responses (Warsono & Yanto, 2020). This physiological shift reduces heart rate and blood pressure, lowers cortisol secretion, and promotes the release of inhibitory neurotransmitters such as gamma-aminobutyric acid (GABA) and serotonin. In patients with DM, these neuroendocrine changes may also improve insulin sensitivity and contribute to glycaemic stability. Manalu et al. (2024) confirmed the efficacy of slow deep breathing in reducing anxiety among DM patients, while Nusantoro & Listyaningsih Kartika (2019) demonstrated reductions in both anxiety scores and blood glucose levels following the intervention.

**Mechanism of Classical Music Therapy**

Classical music therapy complements these effects by modulating hypothalamic activity through auditory pathways. Rhythmic and harmonious auditory stimuli characteristic of classical music activate the nucleus accumbens and prefrontal cortex, promoting dopaminergic release and suppressing amygdala-driven fear responses (Dolang et al., 2022). Concurrently, hypothalamic inhibition of the pituitary–adrenal axis reduces cortisol secretion, fostering parasympathetic dominance and emotional calm. This state enhances concentration and receptivity, enabling patients to engage more effectively with breathing exercises and health education. Ratna Yuliana et al. (2023) highlighted that classical music reduces stress, promotes emotional wellbeing, and improves cognitive focus, all of which support anxiety self-management in elderly DM patients.

**Synergistic Effect of the Combined Intervention**

The sequential combination of slow deep breathing and classical music therapy produces a synergistic anxiolytic effect. Classical music provides an auditory anchor that reduces anticipatory anxiety and enhances relaxation, while slow deep breathing deepens the physiological calm induced by music. Together, they engage both respiratory and auditory neuromodulatory pathways, creating a more robust and durable relaxation response. Ummami & Nasution (2025) demonstrated that combined autogenic relaxation and classical music therapy effectively reduced anxiety within three sessions, consistent with the outcomes observed in this study.

From a nursing perspective, this intervention aligns with the Indonesian Nursing Intervention Standard for Anxiety Reduction (SIKI I.09314), which emphasizes non-pharmacological strategies such as relaxation and complementary therapies. The successful application across patients with heterogeneous anxiety profiles demonstrates its feasibility in community primary care. The intervention requires minimal resources—a smartphone or portable speaker—and no specialized training beyond basic instruction. Importantly, it carries no pharmacological risks, a critical consideration in elderly populations where polypharmacy and cognitive vulnerability are common. Community and home care nurses can readily integrate this protocol into routine visits, thereby enhancing holistic gerontological nursing practice.

**Limitations and Future Directions**

Several limitations must be acknowledged. The descriptive case study design with three patients limits generalizability, and the absence of a control group precludes definitive attribution of outcomes to the intervention alone. The short duration of three sessions does not allow conclusions about long-term efficacy or optimal frequency. Additionally, concurrent health education provided during nursing visits may have independently contributed to anxiety reduction, particularly in Ny.N. Future research should employ randomized controlled trials with larger and more diverse samples, validated anxiety scales such as the Hamilton Anxiety Rating Scale or State-Trait Anxiety Inventory, and longer follow-up periods. Studies should also explore the role of individual differences, including cognitive status and cultural preferences, in shaping responsiveness to combined interventions.

## CONCLUSION

Slow deep breathing therapy combined with classical music represents an effective, accessible, and safe non-pharmacological nursing intervention for reducing anxiety in elderly patients with diabetes mellitus. Across three patients with diverse anxiety presentations, three daily sessions produced consistent improvements in subjective anxiety, physical symptoms, and physiological parameters. These findings support the integration of this evidence-based protocol into routine gerontological nursing practice within Indonesian primary care and community settings, complementing pharmacological and educational strategies for DM-related anxiety. Larger controlled studies are warranted to establish robust evidence for clinical guideline development and to optimize intervention parameters for broader application.

## CONFLICT OF INTEREST

No benefits in any form have been or will be received from any party related directly or indirectly to the subject of this paper. No conflict of interest.

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