



THE EFFECT OF CLASSICAL MUSIC THERAPY ON PAIN INTENSITY IN PATIENTS FOLLOWING OPEN REDUCTION AND INTERNAL FIXATION (ORIF) SURGERY

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ABSTRACT

Pain is one of the primary concerns in patients following Open Reduction and Internal Fixation (ORIF) surgery, as it may hinder the recovery process and delay early mobilization. Non-pharmacological interventions are needed as complementary therapies to support pain management. This study aimed to evaluate the effect of classical music therapy on pain intensity in patients following ORIF surgery. This study employed an Evidence-Based Practice Nursing (EBPN) approach using a one-group pretest–posttest implementation design. Five participants were selected using a purposive sampling technique based on predetermined inclusion and exclusion criteria. The intervention consisted of 20 minutes of classical music therapy delivered through a mobile phone and earphones. Pain intensity was assessed before and after the intervention using the Numeric Rating Scale (NRS). The intervention consisted of 20 minutes of classical music therapy delivered through a mobile phone and earphones. Pain intensity was assessed before and after the intervention using the Numeric Rating Scale (NRS). The results showed that all participants experienced a reduction in pain scores, with a mean decrease of 2 points, from 5.8 (moderate pain) to 3.8 (mild-to-moderate pain). These findings indicate that classical music therapy was effective in reducing pain intensity in patients following ORIF surgery. Therefore, classical music therapy can be recommended as a safe, simple, and effective evidence-based non-pharmacological nursing intervention for pain management.

Keywords: classical music therapy; ORIF; pain; pain management

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INTRODUCTION

Fracture is one of the most common musculoskeletal health problems caused by traumatic events such as traffic accidents, falls, and sports injuries, resulting in the disruption of bone continuity and impaired extremity function (Sagala & Limbong, 2024). Globally, the incidence of fractures remains high, particularly among the productive-age population and older adults, and continues to be one of the leading causes of hospitalization in orthopedic units (Rahmola & Rivani, 2023). Fractures not only affect bone structure but also cause significant acute pain as a physiological response to tissue injury (Binnisa et al., 2023).

Unstable fractures are generally managed through Open Reduction and Internal Fixation (ORIF), a surgical procedure involving open reduction of the fractured bone followed by internal fixation to restore and maintain bone stability (Nuriyah et al., 2025). Although ORIF effectively accelerates bone healing and restores anatomical alignment, the procedure is associated with postoperative pain resulting from surgical incision, bone manipulation, and the inflammatory response occurring during and after surgery (Umami, 2024).

Postoperative pain is one of the most common complaints among surgical patients and serves as an important indicator of the quality of nursing care (Chotimah et al., 2025). Studies conducted over the past five years have reported that approximately 60–80% of postoperative patients experience

moderate to severe pain within the first 24 hours after surgery despite receiving standard analgesic therapy (N. Wulandari et al., 2023). Among orthopedic patients, the prevalence of moderate to severe pain exceeds 70% during the first 48 hours after surgery, highlighting the importance of optimal pain management to prevent further complications (Nuriyah et al., 2025).

In Indonesia, several studies have reported that most postoperative patients continue to experience moderate pain on the first day of hospitalization, with average Numeric Rating Scale (NRS) scores ranging from 4 to 6 (Sari & Rosyid, 2024). Another study found that before receiving non-pharmacological interventions, the majority of patients reported pain scores above 5, indicating moderate to severe pain (Sagala & Limbong, 2024). These findings suggest that postoperative pain remains a significant clinical problem requiring additional interventions beyond pharmacological treatment.

Inadequately managed pain may adversely affect both the physiological and psychological conditions of patients. Physiologically, pain can increase blood pressure and heart rate, disrupt sleep patterns, and delay early mobilization (Rahmola & Rivani, 2023). In patients undergoing ORIF, delayed mobilization due to pain may increase the risk of complications such as joint stiffness and delayed bone healing (Nuriyah et al., 2025). Psychologically, pain may increase anxiety and stress, thereby exacerbating pain perception (N. Wulandari et al., 2023).

Postoperative pain management is commonly achieved through the administration of opioid and non-opioid analgesics (Sari & Rosyid, 2024). However, analgesic therapy has several limitations because it may cause adverse effects, including nausea, vomiting, constipation, sedation, and the risk of dependence with prolonged use (Chotimah et al., 2025). Therefore, non-pharmacological approaches have become an essential component of comprehensive pain management strategies to reduce pain intensity without increasing the risk of medication-related side effects.

One of the most widely studied non-pharmacological interventions in nursing practice is music therapy. Music therapy is a therapeutic intervention that utilizes auditory stimulation to promote relaxation, provide distraction, and modulate pain perception (Luthfiah et al., 2025). The analgesic effect of music therapy is explained by the distraction theory and the gate control theory of pain, whereby auditory stimulation inhibits the transmission of pain impulses to the central nervous system (A. N. R. Wulandari et al., 2025).

Classical music has been widely used because it typically has a stable tempo of approximately 60–80 beats per minute, which closely matches the normal resting heart rate and facilitates physiological relaxation (Hardhanti, 2023). Previous studies have demonstrated that patients who received classical music therapy for 20–30 minutes experienced an average reduction of 1–3 points on the NRS compared with pre-intervention scores (Nusantari, 2025). In these studies, most patients initially experiencing moderate pain (NRS score 4–6) reported mild pain following the intervention (Nusantari, 2025).

A study by Binnisa dkk (2023) also demonstrated that music therapy significantly reduced postoperative pain intensity, with more than 50% of participants showing an improvement from moderate to mild pain categories. Similarly, a case study involving a patient who underwent ORIF for a distal radius fracture reported a gradual reduction in pain scores over three consecutive days of music therapy intervention (Nuriyah et al., 2025).

Sagala and Limbong (2024) reported a significant difference between pre- and post-intervention pain scores among postoperative fracture patients receiving music therapy, indicating its effectiveness as a complementary intervention. Furthermore, another study combining classical

music therapy with deep breathing relaxation demonstrated a significantly greater reduction in pain intensity compared with baseline measurements (Rahmola & Rivani, 2023).

Although numerous studies have demonstrated the effectiveness of music therapy in reducing pain among general surgical and obstetric patients, evidence specifically evaluating the effect of classical music therapy on pain intensity in patients following ORIF surgery remains limited (Nuriyah et al., 2025). Considering that more than 70% of orthopedic patients experience moderate to severe postoperative pain, the need for effective non-pharmacological interventions is becoming increasingly important.

Within the framework of Evidence-Based Practice Nursing (EBPN), nursing interventions should be guided by the best available scientific evidence, clinical expertise, and patient preferences (Isa et al., 2024). Classical music therapy, as a non-invasive, easy-to-administer intervention with minimal adverse effects, has considerable potential to be integrated into nursing care for patients following ORIF surgery.

Given the high prevalence of postoperative pain, its negative impact on patient recovery, and the growing body of evidence supporting the effectiveness of classical music therapy in reducing pain intensity, implementing an Evidence-Based Practice Nursing (EBPN) intervention is warranted. Such an approach integrates the best available research evidence, nurses' clinical expertise, and patient preferences into pain management. Therefore, implementing classical music therapy in patients following ORIF surgery represents a practical application of evidence-based nursing in clinical practice. This EBPN intervention is expected to improve comprehensive pain management, reduce dependence on pharmacological therapy, and strengthen the role of nurses in providing safe, holistic, and evidence-based orthopedic nursing care.

Therefore, this study aimed to implement classical music therapy as an Evidence-Based Practice Nursing (EBPN) intervention and to evaluate its effect on pain intensity in patients following Open Reduction and Internal Fixation (ORIF) surgery. The findings are expected to provide evidence supporting the integration of classical music therapy into postoperative nursing care as a complementary non-pharmacological pain management strategy.

METHOD

This study was conducted as an Evidence-Based Practice Nursing (EBPN) implementation using a one-group pretest–posttest design. The EBPN process included identifying a clinical problem, searching for the best available evidence, critically appraising the evidence, implementing classical music therapy in clinical practice, and evaluating patient outcomes through pre- and post-intervention pain assessments.

The intervention was conducted at Sukoharjo Regional General Hospital, specifically in the Cempaka Ward. Five patients following ORIF surgery were recruited using a purposive sampling technique. Participants were selected consecutively based on predefined inclusion and exclusion criteria during the implementation period in the Cempaka Ward of Sukoharjo Regional General Hospital. The inclusion criteria were patients aged 18 years or older, within postoperative days 1 to 3 following ORIF surgery, experiencing moderate pain with a Numeric Rating Scale (NRS) score of ≥ 4 , fully conscious (*compos mentis*), able to communicate effectively, and willing to participate in the intervention. The exclusion criteria included patients with hearing impairment, cognitive impairment or decreased level of consciousness, severe postoperative complications, and those receiving high-dose sedation.

The implementation procedure began with an initial nursing assessment and baseline pain measurement (pretest) using the Numeric Rating Scale (NRS), which ranges from 0 to 10. Participants then received classical music therapy with a relaxation tempo of approximately 60–80

beats per minute for 20 minutes. The music was delivered through a mobile phone using earphones to ensure optimal auditory stimulation, patient comfort, and minimal environmental distraction during the intervention. Following the 20-minute intervention, pain intensity was reassessed (posttest) using the same instrument.

The instruments used in this implementation included an observation checklist, the Numeric Rating Scale (NRS) for pain assessment, a mobile phone as the classical music playback device, and earphones for delivering the auditory stimulus. Outcomes were evaluated descriptively by comparing pain scores before and after the intervention to determine changes in pain intensity following the implementation of classical music therapy.

RESULT

Table 1
Results of the Classical Music Therapy Intervention

No	Participant	Age (years)	Sex	Post ORIF Day	Pre- intervention Pain (NRS)	Post- intervention Pain (NRS)	Pain Score Reduction
1	Mr. J	35	Male	Day 1	6	4	2
2	Mrs. S	42	Female	Day 1	5	3	2
3	Mr. P	28	Male	Day 1	7	5	2
4	Mrs. A	50	Female	Day 2	6	4	2
5	Mr. S	39	Male	Day 1	5	3	2

Based on table 1, all participants experienced a reduction in pain intensity after receiving 20 minutes of classical music therapy. Pre-intervention pain scores ranged from 5 to 6, indicating moderate pain, whereas post-intervention scores decreased to a range of 3 to 5. The mean pain score decreased from 5.8 before the intervention to 3.8 after the intervention, representing an average reduction of 2 points on the Numeric Rating Scale (NRS).

Participant Mr. J reported a pre-intervention pain score of 6 (moderate pain). Following the 20-minute classical music therapy session, the pain score decreased to 4, representing a reduction of 2 points. Although the pain remained within the moderate category, the decrease indicates a clinically meaningful improvement. During the first postoperative day, pain is generally more pronounced due to the acute inflammatory response. This reduction suggests that classical music therapy provided relaxation and distraction, thereby decreasing the patient's perception of pain.

Participant Mrs. S had an initial pain score of 5 (moderate pain), which decreased to 3 (mild pain) after the intervention, representing a 2-point reduction. This improvement reflects a transition from moderate to mild pain. Subjectively, the patient reported feeling calmer and more comfortable after listening to classical music. These findings indicate that classical music therapy effectively promoted relaxation and distraction, reducing both muscle tension and pain perception.

Participant Mr. P reported an initial pain score of 7, indicating pain approaching the severe category. Following the intervention, the pain score decreased to 5 (moderate pain), representing a 2-point reduction. Although the pain remained within the moderate category, this decrease is considered clinically meaningful. During the early postoperative period, pain intensity is generally higher; therefore, a two-point reduction suggests that classical music therapy provided a substantial relaxation effect and contributed to improved pain control.

Participant Mrs. A had a baseline pain score of 6 (moderate pain), which decreased to 4 following the intervention, representing a 2-point reduction. By the third postoperative day, pain generally begins to subside compared with the first postoperative day; however, discomfort may still persist. Classical music therapy appeared to enhance relaxation and comfort, resulting in a lower perception of pain.

Participant Mr. S reported an initial pain score of 5 (moderate pain), which decreased to 3 (mild pain) after the intervention, representing a 2-point reduction. The patient stated that he felt more relaxed and was able to rest more comfortably following the therapy. The transition from moderate to mild pain further supports the effectiveness of classical music therapy as a complementary non-pharmacological intervention alongside standard analgesic treatment.

Overall, all participants demonstrated a consistent reduction of 2 points on the Numeric Rating Scale (NRS) after receiving 20 minutes of classical music therapy. This finding indicates that classical music therapy had a positive effect on reducing postoperative pain intensity following ORIF surgery. Clinically, a two-point reduction on the NRS is considered meaningful because it improves patient comfort and supports the recovery process. During the intervention, participants appeared more relaxed, exhibited more regular respiratory patterns, and reported feeling more comfortable after listening to classical music. These findings suggest that classical music therapy is a safe, simple, and effective non-pharmacological intervention that can be used as a complementary approach in the management of postoperative pain among patients following ORIF surgery.

DISCUSSION

The findings of this Evidence-Based Practice Nursing (EBPN) implementation demonstrated that all participants experienced a reduction in pain intensity following a 20-minute session of classical music therapy, with an average decrease of 2 points on the Numeric Rating Scale (NRS). These findings are consistent with previous evidence indicating that music therapy is an effective non-pharmacological strategy for reducing postoperative pain. A recent study involving patients with fractures reported a significant reduction in pain scores following Mozart classical music therapy, supporting the present findings that classical music can effectively reduce pain perception in clinical settings (Agustiara et al., 2025).

The reduction in pain intensity observed in this study can be explained by the Gate Control Theory of Pain, which proposes that pain perception is not solely determined by nociceptive stimuli but is also influenced by neurological processes within the spinal cord and brain. According to this theory, the dorsal horn of the spinal cord functions as a "gate" that regulates the transmission of pain signals to the central nervous system. Non-painful sensory stimuli, such as music, compete with nociceptive impulses and may close this gate, thereby inhibiting pain signal transmission and ultimately reducing pain perception (Herlina & Waluyo, 2024).

Furthremore, Li et al (2024) reported that perioperative music therapy consistently reduced postoperative pain and anxiety. Their study demonstrated that patients who received music therapy before and after surgery experienced significantly lower pain scores than those in the control group. These findings support the results of the present implementation, suggesting that music therapy serves as an effective complementary intervention for postoperative pain management.

Similarly, a clinical study conducted by Goel et al (2024) demonstrated that music therapy as a non-pharmacological intervention effectively reduced pain intensity following major surgical procedures, including orthopedic surgery. The study also found that music therapy reduced postoperative opioid requirements, indicating that music not only improves patients' pain experience but also contributes to decreased analgesic consumption.

Another study investigating perioperative music therapy in orthopedic surgical patients reported reductions in both opioid and anxiolytic use, accompanied by higher patient satisfaction (Zhang et al., 2025). These findings further suggest that music therapy influences not only pain perception but also the overall need for pharmacological pain management. Such evidence supports the implementation of multimodal pain management strategies that integrate pharmacological and non-pharmacological interventions to optimize patient outcomes.

The findings of Magfirra et al (2026) are also consistent with the present study, demonstrating that classical or relaxation music administered for 20–30 minutes per session effectively promotes relaxation and reduces pain intensity. Music diverts patients' attention away from painful stimuli, thereby decreasing pain perception through distraction and muscle relaxation.

Comparable findings have also been reported among patients undergoing cesarean section, where music therapy significantly reduced pain intensity compared with standard analgesic treatment alone (Mariani & Murhan, 2024). Patients receiving music therapy experienced a faster reduction in pain, highlighting its effectiveness as a complementary intervention. These findings suggest that the analgesic benefits of music therapy are not limited to a specific surgical population but are applicable across various surgical procedures, including orthopedic and obstetric surgeries, reflecting the broad applicability of its analgesic mechanisms.

Similarly, a case study involving patients following appendectomy demonstrated that instrumental music therapy effectively reduced acute postoperative pain (Nyoman et al., 2025). The authors concluded that musical stimulation promotes relaxation and decreases pain perception regardless of the surgical site or procedure performed. These findings reinforce systematic evidence indicating that music therapy plays an important role in comprehensive pain management across diverse clinical settings.

Several studies have specifically demonstrated that classical music therapy significantly reduces postoperative pain compared with baseline measurements. The distraction and relaxation induced by music redirect patients' attention from painful sensations toward more pleasant auditory experiences. Similar findings were reported in fracture patients receiving Mozart classical music therapy, where pain reduction was associated with altered pain perception and enhanced relaxation (Agustiara et al., 2025).

From a physiological perspective, music therapy may also exert endogenous analgesic effects by stimulating the limbic system and promoting the release of endorphins, mechanisms that complement the principles of the Gate Control Theory. Therefore, classical music therapy not only distracts patients from painful stimuli but also modulates neurochemical processes that contribute to significant reductions in subjective pain perception (Meilinda et al., 2024).

Moreover, structured and consistent implementation of music therapy may facilitate postoperative recovery by reducing pain, alleviating anxiety, and improving patients' emotional well-being. Previous evidence has demonstrated that music therapy also contributes to reductions in blood pressure and heart rate, both of which are physiological indicators of the body's stress response and are closely associated with pain perception (Li et al., 2024).

Overall, the findings of this study demonstrate that classical music therapy is effective in reducing postoperative pain among patients following ORIF surgery. The observed effects are supported by well-established neurological and psychological mechanisms, including pain modulation through the Gate Control Theory, distraction, relaxation, and endogenous analgesic responses. These findings reinforce the importance of integrating non-pharmacological interventions, such as classical music therapy, into evidence-based postoperative pain management to enhance patient comfort, support recovery, and strengthen holistic nursing care.

CONCLUSION

Based on the implementation of Evidence-Based Practice Nursing (EBPN) regarding the effect of classical music therapy on pain intensity among patients following Open Reduction and Internal Fixation (ORIF) surgery in the Cempaka Ward of Sukoharjo Regional General Hospital, it can be

concluded that classical music therapy is effective in reducing postoperative pain intensity. All participants experienced a reduction in pain scores after receiving a 20-minute session of classical music therapy. The mean pain score decreased from 5.8, indicating moderate pain before the intervention, to 3.8 after the intervention, representing an average reduction of 2 points on the Numeric Rating Scale (NRS). This reduction is considered clinically meaningful, as it improved patient comfort and shifted pain intensity from the moderate toward the mild category.

These findings are consistent with the Gate Control Theory of Pain, which explains that auditory stimulation, such as music, can inhibit the transmission of pain impulses through neural modulation mechanisms. The results are also supported by recent evidence demonstrating that music therapy is an effective, safe, and easy-to-implement non-pharmacological intervention that can be used as a complementary approach to postoperative pain management.

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