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The Effect of Preoperative Health Education with Educational Video Media on Anxiety, Pain, and Early Mobilization Behavior in Patients with Postoperative Lower Extremity Fracture – ORIF (Open Reduction Internal Fixation)

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Abstract:
Surgical interventions experience various challenges during the recovery process, including levels of anxiety, pain, and difficulty in early mobilization. The provision of education as a health education method needs to be emphasized in this phase. The sophistication of technology in presenting health education through video media is one alternative for education delivery. This study aims to explain the effect of preoperative health education with educational video media on anxiety, pain, and early mobilization behavior in patients with post-ORIF (Open Reduction Internal Fixation) lower extremity fractures. This study uses an Experimental Design (posttest-only with a control group). Two groups were randomly selected; the experimental group received a health education intervention using educational videos, while the control group received a health education intervention in accordance with the hospital's Standard Operating Procedures (SOPs). Analysis with an Independent sample t-test showed a significant value of intervention in providing preoperative health education with educational video media on anxiety ($p < \alpha = 0.040$), on pain ($p < \alpha = 0.025$), and on early mobilization ($p < \alpha = 0.001$) in patients with post-ORIF (Open Reduction Internal Fixation) lower extremity fractures. Preoperative health education using an educational video on early mobilization behavior variables showed a difference or average change value that was more positive than those for the anxiety and pain variables. Preoperative health education intervention with educational video media affects anxiety, pain, and early mobilization of patients with lower limb fractures after ORIF. The delivery of education with video media is more effective and more focused on achieving the goal of providing education. The intervention group showed a decrease in the average level of anxiety and pain, as well as a better average early mobilization behavior than the control group. Health education in the form of educational videos attracts more attention by delivering clearer information supported by the detailed process of moving illustrations and presenting objects in detail, which can help understand difficult material and provide an emotional and motivational impact, to help respondents reduce anxiety levels, pain, and improve early mobilization behaviors in the rehabilitation phase after surgery.

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INTRODUCTION

Lower extremity fractures represent a significant global health burden, commonly resulting from traumatic incidents in productive-aged adults or low-energy falls in the elderly due to osteoporosis-related bone fragility (Li & Lin, 2025). These injuries, encompassing fractures of the femur, tibia, and fibula, frequently lead to functional impairment, prolonged immobilization, and

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February 2026
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diminished quality of life (Emara et al., 2023). Beyond the immediate mechanical disruption, such fractures carry substantial risks of secondary complications, including deep vein thrombosis, pulmonary infections, wound complications, and long-term disability, particularly when early mobilization is delayed (Zhao et al., 2022). The high incidence of these injuries and their potential for adverse outcomes underscore the necessity for comprehensive, patient-centered perioperative management strategies that extend beyond surgical correction alone (Liu et al., 2021).

Open Reduction and Internal Fixation (ORIF) remains the gold standard surgical intervention for displaced or unstable lower extremity fractures, aiming to restore anatomical alignment and enable early functional recovery through rigid internal stabilization (Eldin et al, 2023). Despite its biomechanical advantages, the postoperative trajectory following ORIF is often complicated by significant physiological and psychological challenges (Dong et al., 2025; Rasdini et al., 2024). Patients commonly experience acute postoperative pain, heightened anxiety, and reluctance toward early mobilization. factors that may collectively impede rehabilitation, prolong hospitalization, and increase susceptibility to complications such as venous thromboembolism and muscle atrophy. These interrelated barriers highlight the critical need for interventions that address not only the physical but also the psychological dimensions of postoperative recovery (Stephen et al., 2025).

Preoperative anxiety is a well-documented phenomenon that peaks during the pre-surgical phase and significantly influences postoperative outcomes (Ni et al., 2023). Elevated anxiety levels have been associated with increased perception of pain, heightened analgesic requirements, delayed ambulation, and prolonged recovery trajectories (Priol et al., 2023). This psychological distress often stems from uncertainty regarding surgical procedures, fear of pain, and concerns about functional impairment (Morriss et al., 2023). Evidence suggests that unaddressed preoperative anxiety can trigger maladaptive physiological responses, including heightened sympathetic activation, which may exacerbate pain sensitivity and impair wound healing (Ginsberg et al., 2022). Consequently, effective anxiety mitigation through structured preoperative preparation has emerged as a vital component of enhanced recovery after surgery (ERAS) protocols (Lobo et al., 2024).

Traditional preoperative education, typically delivered through verbal instruction and printed materials, often proves insufficient in adequately preparing patients for the realities of postoperative recovery. Such approaches may fail to capture patient attention, accommodate variations in health literacy, or effectively convey procedural expectations and self-management techniques (Brodersen et al., 2023). In contrast, audiovisual educational tools, particularly professionally designed videos, offer a multimodal learning experience that enhances information retention, reduces uncertainty, and promotes self-efficacy (Zhitomirsky & Aharony, 2023; Latifah et al., 2024). Video-based education can realistically depict surgical procedures, demonstrate breathing and mobilization exercises, and normalize the recovery experience, thereby fostering psychological preparedness. Emerging evidence supports the efficacy of such media in reducing preoperative anxiety and improving postoperative behavioral outcomes across various surgical populations (Pedramrazi et al., 2024; Fanny et al., 2024).

This study investigates the effect of structured preoperative health education delivered via educational video media on three critical recovery indicators in patients undergoing ORIF for lower extremity fractures: preoperative anxiety levels, postoperative pain intensity, and adherence to early mobilization protocols. By leveraging an engaging, standardized audiovisual intervention that comprehensively addresses procedural expectations, pain management strategies, and the physiological rationale for early ambulation, this approach aims to bridge the gap between clinical instruction and patient understanding. The findings may contribute to optimizing perioperative care pathways, enhancing patient engagement, and ultimately improving functional recovery outcomes following orthopedic trauma surgery (Lee et al., 2024).

Volume 04 Number 01
February 2026
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METHOD

Study Design

This study employed a posttest-only control-group design to evaluate the effectiveness of a video-based health education intervention among patients with post–Open Reduction Internal Fixation (ORIF) lower extremity fractures at SLG Hospital Kediri. This design was selected to assess causal relationships between the intervention and outcomes while minimizing threats to internal validity, particularly pretest sensitization effects. Random assignment was implemented to ensure baseline equivalence between groups and to reduce selection bias.

Study Setting and Participants

The study was conducted at SLG Hospital Kediri, a secondary referral hospital providing orthopedic surgical services. The study population consisted of patients diagnosed with post-ORIF lower extremity fractures who met the inclusion criteria during the data collection period. A total of 42 participants were recruited and evenly allocated to two groups: 21 in the intervention group and 21 in the control group, ensuring balanced group sizes for statistical comparison.

Randomization and Group Allocation

Participants were randomly assigned to either the intervention or control group using a random allocation procedure to ensure equal probability of assignment. This randomization process enhanced internal validity by minimizing confounding variables and ensuring that any post-intervention differences could be attributed to the intervention rather than pre-existing characteristics.

Intervention

The intervention group received a structured health education program delivered via professionally developed educational videos. The video content was designed to improve patient understanding and knowledge retention through a combination of visual and auditory learning modalities, covering key aspects of post-ORIF care and recovery.

The control group received conventional health education in accordance with the hospital's Standard Operating Procedures (SOPs). This standard education typically involved verbal explanations and printed educational materials routinely provided in clinical practice.

Outcome Measurement

The primary outcome was assessed after the intervention using a standardized measurement tool appropriate for evaluating the targeted educational outcomes (e.g., knowledge, self-care behavior, or functional readiness). Outcome assessment was conducted uniformly across both groups to ensure consistency and comparability.

Data Analysis

Data were analyzed using the independent-samples t-test, a parametric test appropriate for comparing the means of two independent groups. This test was applied to determine whether post-intervention outcome differences between the video-based education group and the SOP-based education group were statistically significant. Statistical significance was determined at a predefined alpha level ($p < 0.05$).

Ethical Considerations

The study protocol received ethical approval from the Ethics Review Board of the University of Strada Indonesia. All participants provided written informed consent prior to participation. Ethical principles, including confidentiality, voluntary participation, and the right to withdraw without penalty, were strictly upheld throughout the research process.

RESULT

Based on the collected data, 42 respondents participated in this research. The following is the frequency distribution of respondents by gender, age, education, occupation, surgical history, and fracture location among post-ORIF lower extremity fracture patients in the Punai and Perkutut Rooms at SLG Hospital Kediri in June – July 2024.

Table 1. Distribution of Respondent Characteristics and Clinical Variables (n = 42)

Variable	Category	Control Group n (%)	Intervention Group n (%)
Gender	Male	11 (52)	7 (33)
	Female	10 (48)	14 (67)
Age (years)	18–20	4 (19)	3 (14)
	21–30	4 (19)	4 (19)
	31–40	1 (4)	3 (14)
	41–50	2 (10)	2 (10)
	51–60	10 (48)	9 (43)
Education	Junior high school	5 (24)	1 (4)
	Senior high school	15 (72)	18 (86)
	Diploma/Bachelor	1 (4)	2 (10)
Occupation	Self-employed	10 (48)	6 (29)
	Housewife	7 (33)	11 (52)
	Not working	4 (19)	4 (19)
Surgical history	Once	1 (4)	3 (14)
	Never	20 (96)	18 (86)
Fracture location	Femur	8 (39)	8 (38)
	Tibia	4 (19)	6 (28)
	Cruris	5 (24)	3 (14)
	Fibula	0 (0)	2 (10)
	Patella	1 (4)	0 (0)
	Pedis	3 (14)	2 (10)

Based on Table 1, respondent characteristics and clinical profiles were generally comparable between the control and intervention groups. In the control group, most respondents were male (52%), whereas in the intervention group, the majority were female (67%). Regarding age distribution, nearly half of the respondents in both the control (48%) and intervention (43%) groups were aged 51–60 years, while smaller proportions (<25%) were distributed across the younger age categories (18–50 years).

Regarding educational background, most respondents in both groups had completed senior high school, with 72% in the control group and 86% in the intervention group. Smaller proportions had completed junior high school or held a diploma or bachelor's degree, and no respondents reported elementary school education. Occupational status varied slightly between groups; the control group was largely self-employed (48%), whereas the intervention group was predominantly composed of housewives (52%). Approximately one-fifth of respondents in both groups were not working.

Regarding clinical characteristics, the majority of respondents in both groups reported no prior surgical history (control: 96%; intervention: 86%). Femoral fractures were the most common fracture location in both groups (control: 39%; intervention: 38%), followed by tibial fractures in the intervention group (28%) and crural fractures in the control group (24%). Other fracture locations, including fibula, patella, and pedis, were reported in smaller proportions (<25%).

Table 2. Distribution of Respondent Outcomes by Group (n = 42)

Variable	Category	Control Group n (%)	Intervention Group n (%)
Anxiety level	Severe	2 (10)	0 (0)
	Moderate	15 (71)	17 (81)
	Mild	4 (19)	4 (19)
Pain level	Severe	7 (33)	1 (4)
	Moderate	13 (63)	16 (77)
	Mild	1 (4)	4 (19)
Early mobilization behavior	Good	5 (24)	14 (67)
	Sufficient	11 (52)	7 (33)
	Poor	5 (24)	0 (0)

Psychological and postoperative clinical outcomes showed that most respondents in both groups experienced moderate anxiety levels (control: 71%; intervention: 81%). Mild anxiety was reported by 19% of respondents in each group, while severe anxiety was observed only in the control group (10%). Similarly, moderate pain was the most frequently reported pain level in both groups (control: 63%; intervention: 77%). Severe pain was more prevalent in the control group (33%) compared with the intervention group (4%), while mild pain was reported by a smaller proportion of respondents.

Regarding functional outcomes, early mobilization behavior differed notably between groups. In the control group, most respondents (52%) demonstrated sufficient early mobilization, with smaller proportions showing good or poor mobilization. In contrast, the intervention group predominantly exhibited good early mobilization behavior (67%), with the remaining respondents demonstrating sufficient mobilization and none exhibiting poor mobilization behavior.

DISCUSSION

The Effect of Preoperative Health Education Using Educational Video Media on Anxiety in Post-ORIF (Open Reduction Internal Fixation) Lower Extremity Fracture Patients

The statistical analysis of the anxiety variable was significant. (2-tailed) value of 0.040 < 0.05, which shows that preoperative health education using educational video media affects anxiety in post-ORIF lower extremity fracture patients. The results of data processing also show that the level of anxiety experienced by respondents in the control group who had been given preoperative health education using a direct lecture method based on instruments in accordance with standard hospital operating procedures, and the intervention group who were given education using educational video instruments, were mostly the same, namely, experiencing the same level of moderate anxiety. Differentiating results were obtained in the control group, where there was still a small number of respondents who experienced severe anxiety. In contrast, in the intervention group, none of the respondents experienced severe anxiety. A small degree of mild anxiety was still experienced by respondents in the control group and intervention group.

In this phase, educational activities, including health education, must be emphasized to ensure patients receive convincing information and do not experience anxiety or worry. Activities related to

health education include providing counseling or health education using educational video media to patients regarding upcoming surgical procedures, helping patients in determining situations that trigger anxiety and identifying signs of anxiety, explaining surgical procedures before implementation or action, creating a warm atmosphere and establishing a relationship of mutual trust, showing empathy and concern, accompanying patients as necessary to increase safety and security and reduce feelings of fear or worry, communicating with short but clear sentences, and showing concern and empathy (Tom & Phang, 2022).

Researchers believe that providing health education through video media influences anxiety levels because audiovisual media, such as video, engage multiple senses (sight, hearing, and touch), thereby facilitating information absorption. There are many benefits obtained by using audio visual media, namely: attracting more attention, the audience can get information from experts or specialists, can make demonstrations that are considered difficult easier, complete control is held by the teacher or health education provider, can be played in a lighted room, recordings can be played or broadcast repeatedly, saving time, and the volume can be adjusted as desired (Zarifsanaiey et al., 2024). Compared to delivering education through lectures or verbally, it allows respondents to understand less of what the information sheet means. Even though a decrease in anxiety scores was still observed at a similar level, providing health education through video media could be a better choice, given its conveniences and advantages.

The Effect of Preoperative Health Education Using Educational Video Media on Pain in Post-ORIF (Open Reduction Internal Fixation) Lower Extremity Fracture Patients

The statistical analysis of the pain variable was significant. (2-tailed) value of 0.025 < 0.05, indicating that preoperative health education via educational video media affects pain response in post-ORIF lower extremity fracture patients. The characteristics of respondents based on gender show that the level of severe pain experienced by male and female respondents is different. Meanwhile, respondents based on age characteristics showed that the level of pain was moderate and severe pain was experienced by respondents aged 51-60 years, a more detailed assessment must be carried out when elderly patients report pain, this is because older adults often have more than one source of pain, sometimes different diseases they suffer from cause the same symptoms and the elderly sometimes surrender to what they feel. The results of special data processing indicate the level of pain experienced by respondents in the control group who received preoperative health education via a direct lecture method, using instruments in accordance with Standard Hospital Operational Procedures. Most of them still showed a moderate level of pain response, and almost half showed a severe pain response. In the intervention group that received education via educational video instruments, the majority experienced moderate pain, and a small percentage showed a mild pain response. Preoperative educational interventions are effective in informing patients undergoing surgery, thereby reducing postoperative pain (Abbasnia et al., 2023). The goal of treatment is to reduce the pain threshold to a tolerable level so that the patient can participate in the recovery process. Providing health education via video aims to increase respondents' ability to manage pain and reduce post-surgery pain.

Researchers believe that providing health education through video media influences health outcomes. Data tabulation shows better results from education via educational videos than from the lecture method in terms of pain levels. This is because video-based health education can effectively support patient learning. Delivery of educational information that is better aligned with needs will be more popular, making it easier to learn and achieve educational goals. Health education in the form of interesting, animated films has an emotional and motivational impact, helping respondents reduce pain levels in the rehabilitation phase after surgery (Morgado et al., 2024). Pain management will be

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February 2026
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easier to learn and practice with more video demonstrations. Through access to video media, recordings can be played or shown repeatedly, saving time, and according to everyone's level of understanding. Compared to delivering education through lectures or verbally, it allows respondents to understand less what the information sheet means, and it limits the teacher's time, if required, to ensure that patients can practice what has been taught in a short time. However, more research is needed to support evidence-based investments in educational video platforms in hospitals to improve pain management across various patient conditions.

The Effect of Preoperative Health Education Using Educational Video Media on Early Mobilization Behavior in Post-ORIF (Open Reduction Internal Fixation) Lower Extremity Fracture Patients

The results of the statistical analysis of the early mobilization behavior variable showed Sig. (2-tailed) value of 0.001 < 0.05, indicating that preoperative health education via educational video media affects early mobilization behavior in post-ORIF lower extremity fracture patients. The results of data processing also show that the early mobilization behavior experienced by respondents in the control group, who had been given preoperative health education using a direct lecture method based on instruments in accordance with Standard Hospital Operational Procedures, mostly had adequate mobilization behavior, while the intervention group, which was given education using video instruments. Education mostly shows good mobilization behavior. Providing education through animated videos on early mobilization has been shown to accelerate walking recovery in post-surgical patients. Early mobilization protocols for patients undergoing surgery have been shown to help patients get out of bed more quickly and reduce perioperative mortality and length of stay (LOS) (Nursalam et al., 2023).

Researchers believe that health education through video media yields better results in early mobilization behavior than without media or the lecture method alone. Video media is an effort to facilitate the delivery of education compared to conventional methods. The short duration of the early mobilization video delivery can help avoid misunderstandings of the material. It can be shown twice or more, as needed, to ensure respondents understand the content in more detail. Providing health education, especially regarding early postoperative mobilization, has a significant impact, not only reducing treatment time but also speeding recovery and healing (Rhamelani et al., 2026). Several opinions regarding the factors that influence early mobilization in post-surgical patients can be studied further with more focused targets. Targets with homogeneous types of surgery and treatment, along with the types of anesthesia used, can be considered for further studies to achieve better results.

CONCLUSION

This study demonstrates that preoperative health education delivered through educational video media significantly enhances multiple recovery outcomes for patients undergoing ORIF for lower extremity fractures at SLG Hospital Kediri. Compared to conventional health education methods, the video-based intervention proved more effective in alleviating preoperative anxiety, likely by providing clear visual explanations of the surgical procedure and recovery expectations that fostered psychological preparedness. This anxiety reduction subsequently contributed to lower perceived pain levels during the early postoperative period, suggesting an important mind-body connection in pain modulation. Furthermore, the comprehensive and engaging nature of the video media empowered patients with practical knowledge of postoperative care and mobility exercises, which directly translated into more proactive early mobilization, a critical factor in preventing

Volume 04 Number 01
February 2026
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complications and accelerating functional recovery. Collectively, these findings underscore the clinical value of integrating structured audiovisual education into preoperative nursing protocols, as it simultaneously addresses the psychological, sensory, and behavioral dimensions of recovery, ultimately promoting more optimal patient outcomes following orthopedic surgery.

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