International Journal of Multidisciplinary Research and Development
www.allsubjectjournal.com
ISSN Online: 2349-4182 ISSN Print: 2349-5979
Received: 11-01-2024, Accepted: 03-02-2024, Published: 26-02-2024
Volume 11, Issue 2, 2024, Page No. 121-124

Analysis of the impact of early mobilization on the level of discomfort of patients after orthopedic surgery at Royal Prima Hospital in Medan 2024

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Abstract
Orthopedic surgery, aimed at correcting musculoskeletal deformities, may lead to postoperative pain. Adequate pain control is crucial for reducing anxiety and facilitating deep breathing, allowing patients to tolerate rapid mobilization. This study, conducted at RSU Royal Prima Medan in January 2024, analyzed the impact of early mobilization on postoperative pain in orthopedic patients. Using a correlational descriptive research approach and a One Group Pretest-Posttest design, the study included 125 samples from 178 orthopedic postoperative patients. Data analysis, performed with SPSS version 25, utilized univariate and bivariate methods (paired t-test) with a significance level of 0.05. Results indicated that, before early mobilization, the majority of respondents (50%) experienced increased pain, with a minority (20%) reporting severe pain. Most respondents (64%) demonstrated effective early mobilization, while a minority (36%) faced challenges. Following Early Mobilization, the majority (55%) felt slightly more pain, and the minority (45%) experienced increased pain. The paired t-test yielded a p-value of 0.011 ≤ 0.05, leading to the rejection of Ho and acceptance of Ha. In conclusion, early mobilization effectively reduced pain levels in orthopedic patients at Royal Prima Medan General Hospital in 2024, with the majority experiencing a shift to "Slightly More Pain" after the intervention.

Keywords: Orthopedic surgery, early mobilization, postoperative pain, orthopedic patients

Introduction

Postoperative complications encompass circulatory, urinary, wound, gastrointestinal, and safety issues. Postoperative pain typically emerges 12-36 hours after the procedure, particularly in intra-abdominal surgery, affecting approximately 60% of patients severely. Pain is subjective, varying between individuals, posing challenges for patients and healthcare professionals. Adequate pain control is crucial for facilitating mobilization and alleviating postoperative anxiety, emphasizing optimal evaluation and analgesic use. Orthopedic surgery focuses on correcting deformities to restore movement stability and relieve pain and disability (Iswari & Florencia, 2016) [7]. Notably, orthopedic surgery aims to enhance function by addressing musculoskeletal deformities. Common postoperative problems include circulation, urinary, wound, gastrointestinal, and safety issues. Surgical interventions may induce postoperative pain, typically manifesting 12 to 36 hours post-surgery (Rohmayani & Suwito, 2017) [14]. Pain is subjective, and its experience varies among individuals. Pain relief is crucial postoperatively, as it mitigates anxiety and promotes deeper breathing, facilitating rapid mobilization (Hidayatulloh *et al*., 2020) [6]. Practical pain assessment and appropriate analgesic use are essential for comprehensive postoperative pain management, aiming to minimize pain with minimal side effects. Early postoperative mobilization is a strategic approach to promptly guide patients out of bed, fostering walking and shifting focus from pain to mobilization activities (Izzah *et al*., 2024) [8]. Early mobilization significantly accelerates postoperative recovery and mitigates complications, as supported by Pristahayuningtyas *et al*.'s (2016) [5] research demonstrating its positive impact on pain levels post-appendectomy (Caecilia & Pristahayuningtyas, Murtaqib, 2016) [5]. This study aims to analyze the influence of early mobilization on postoperative pain levels in orthopedic surgery patients.

Research Methods

This research employs a descriptive correlational design, specifically investigating the impact of early mobilization on pain changes in orthopedic postoperative clients using a One Group Pretest-Posttest approach. The study will be conducted at RSU Royal Prima Medan in March 2024, with a population comprising all orthopedic postoperative patient data from the last three months, totaling 178 patients. The sample size determination follows the Slovin method:

$$n = \frac{N}{1 + Ne^2}$$

n = 178/1+((178 x $(0.05)^2$)
n = 178/1+(178 x 0.0025)
n = 178/1+ 0.445
n = 178/1.445
n = 123.18 rounded up to 125 people.
.

Notes
n = Minimum sample
N = Population sample
e = tolerance limit percentage (0.05)

The sample selection involves utilizing non-probability sampling, explicitly employing a consecutive sampling method. Inclusion criteria encompass orthopedic postoperative patients undergoing treatment at Royal Prima

Medan Hospital who are present during the research. Eligible participants exhibit stable vital signs (blood pressure, pulse, temperature, and respiration) and a willingness to participate as respondents. Exclusion criteria involve patients with unstable vital signs, decreased consciousness, or those unwilling to participate. Data analysis utilizes the SPSS version 25 application, employing univariate and bivariate methods (paired t-test) to assess differences in pain scale before and after early mobilization. The significance threshold is set at 0.05, interpreting a p-value ≤ 0.05 as "meaningful" and $p \geq 0.05$ as "not meaningful" in the statistical results."

Research Results

In this research, respondent characteristics have been profiled based on various variables. Predominantly, the majority falls within the 41 to 50 years age range (50%), with a higher representation of females (56%). Educational backgrounds are diversified, with percentages distributed among junior high school (28%), high school (38%), and higher education (34%). Regarding employment, entrepreneurs constitute the majority (45%), followed by civil servants (34%) and private employees (22%). This comprehensive data provides insight into the diversity within the respondent group under investigation.

Table 1: Overview of Research Respondents, based on Age, Gender, Education and Employment Status

Category	Characteristics	Number	Percentage
Age	<30 Years	3	2%
	30 s/d 40 Years	11	9%
	41 s/d 50 Years	63	50%
	>50 Years	48	38%
Total		125	100%
Gender	Male	70	56%
	Female	55	44%
Total		125	100%
Education	SMP (Junior High School)	35	28%
	SMA (High School)	48	38%
	Higher Education (D3, S1, S2, S3)	42	34%
Total		125	100%
Employment Status	PNS (State employee)	42	34%
	Private Employee)	27	22%
	Entrepreneurship	56	45%
Total		125	100%

Source: Primary data, processed in 2024.

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Postoperative pain is an inevitable side effect for those undergoing surgery, including orthopedic procedures. Adhesions between tissues resulting from surgery can significantly cause this pain. It's crucial to note that complete elimination of pain is nearly impossible, and individuals will experience varying degrees of pain. The assessment of pain levels is typically done using facial scales that represent different intensity levels:

0 = No pain,
1 = Slight pain,
2 = Slightly more pain,
3 = More pain,
4 = Severe pain and
5 = Severe pain (andriani, 2016).

Table 2: Frequency and Percentage Distribution of Pain Levels of Orthopedic Postoperative Clients Before Early Mobilization at Royal Prima Medan Hospital in 2024

No	Pain Levels	Sum (n)	Percentage
1	Severe Pain	25	20%
2	Pain Once	38	30%
3	More Pain	62	50%
	Total	125	100

Source: Primary data, processed in 2024.

Based on Table 2. it is known that the analysis of pain levels in respondents shows that the majority of them, namely 50%, experience pain levels as "More Pain." This was followed by "Very Painful" at 30%, while "Severe Pain" was recorded at 20%. This data provides an overview of the distribution of pain levels within the respondent population, which can be essential in understanding early mobilization's impact on patients' pain levels after orthopedic surgery at Royal Prima Medan Hospital in 2024.

Table 3: Frequency and Percentage Distribution of Early Mobilization of Orthopedic Postoperative Clients at Royal Prima Medan Hospital in 2024.

No	Early Mobilization	Sum (n)	Percentage
1	Can Do Well	80	125%
2	Can't Perform Well	45	36%
	Total	125	100%

Source: Primary data, processed in 2024.

Based on Table 3, the analysis of early mobilization on respondents reveals that the majority, accounting for 64%, demonstrated effective mobilization, while the remaining 36% encountered challenges in carrying out mobilization activities. This data provides insights into the extent of patient involvement in the recovery process, specifically in their ability to mobilize after undergoing orthopedic surgery at Royal Prima Medan Hospital in 2024. Such information serves as a foundational element for assessing the effectiveness of early mobilization and understanding its correlation with postoperative pain levels among patients.

Table 4: Frequency and Percentage Distribution of Pain Levels of Orthopedic Postoperative Clients After Early Mobilization at Royal Prima Medan Hospital in 2024

No	Pain Level	Sum (n)	Percentage
1	More Pain	57	45
2	Slightly More Painful	68	55
	Total	125	100,00

Source: Primary data, processed in 2024.

Based on Table 4, the analysis of pain levels among respondents indicates that the majority, constituting 55%, reported pain levels as "Slightly More Painful," while the remaining 45% described their pain levels as "More

Painful." This data highlights the diversity in pain experiences within the respondent population, offering valuable insights into the influence of early mobilization on post-orthopedic surgery pain levels at Royal Prima Medan Hospital in 2024. Such information can be a foundation for enhancing patient care and developing more effective pain management strategies.

Table 5: Pain Level Before and After Early Mobilization in Orthopedic Postoperative Clients at Royal Prima Hospital

No	Tingkat Nyeri	Jumlah (n)	Mean	SD	Min Max
1	Pre-Mobilisasi Dini	125	4.11	0.701	3-5
2	Post-Mobilisasi Dini	125	3.35	0.468	2-3

Source: Primary data, processed in 2024.

Table 5 indicates that the analysis of pain levels before and after the implementation of early mobilization in patients reveals noteworthy differences. Before early mobilization (Pre-Mobilization Early), the mean pain level was 4.11, ranging between 3 and 5. In contrast, after undergoing early mobilization (Post-Mobilization Early), the mean pain level decreases to 3.35, with a score range of 2 to 3. This substantial decrease signifies a positive indication of the efficacy of early mobilization in alleviating patients' pain levels following orthopedic surgery at Royal Prima Medan Hospital in 2024. This data establishes a robust foundation supporting the benefits of early mobilization in pain management, demonstrating a favorable shift in patients' pain experiences post-intervention.

Table 6: Results of the Wilcoxon Signed Ranks Test Description of Changes in Pain Levels Before and After Early Mobilization in Orthopedic Postoperative Clients at Royal Prima Medan Hospital in 2024.

No	Pain Level	Sum (n)	Mean	Z	*p-value*
1	Early Pre-Mobilization	125	4.11	3.854	0,011
2	Early Post-Mobilization	125	3.35		

Source: Primary data, processed in 2024.

Table 6 presents results from statistical analysis revealing a significant difference in pain levels before and after the application of early mobilization in patients. Before early mobilization (Pre-Early Mobilization), the mean pain level was 4.11, while after early mobilization (Post-Early Mobilization), the mean pain level decreased to 3.35. Utilizing the Z statistical test, the analysis demonstrated a significant difference with a Z value of 3.854 and a p-value of 0.011. This suggests a statistically significant association between early mobilization and decreased patient pain following orthopedic surgery at Royal Prima Medan Hospital in 2024. These findings strongly support the effectiveness of early mobilization as a strategy with the potential to reduce pain levels in patients post-orthopedic surgery.

Discussion

Pain levels before early mobilization for orthopedic postoperative clients at Royal Prima Medan Hospital, 2024

Pain is a subjective experience, varying among individuals and affecting people of all ages. The causes of pain include disease processes, injuries, procedures, and surgical interventions (Astutik & Kurlinawati, 2017) [2]. Surgery is a biphasic event for the human body, significantly impacting pain management. Typically, postoperative patients experience severe pain within the first two hours after surgery, as the effects of anesthetic drugs wear off, with an average recovery time of 72.45 minutes (Nurdin *et al*., 2013) [12]. Untreated postoperative pain can lead to delayed rehabilitation, prolonged hospitalization, increased complications, and higher costs as patients focus their attention on the pain they are experiencing (Berkanis *et al*., 2020) [4].

The research results, involving 64 respondents at Royal Prima Medan Hospital in 2024, indicate that before early mobilization, most respondents experienced increased pain, while a minority reported severe pain. The theory suggests that orthopedic postoperative pain is acute and reaches severe levels due to damage from superficial tissues to exposed bones, blood vessels, and nerves. Efficient pain management, including early mobilization, is crucial to enhance the rehabilitation process and reduce the overall impact of postoperative pain on patients' recovery and hospitalization.

Pain levels after early mobilization for orthopedic postoperative clients at Royal Prima Medan Hospital, 2024

Pain is a complex and elusive sensation often associated with tissue damage or other factors (Nuruzzaman, 2018) [13]. It can be described as a universal yet mysterious phenomenon, serving as a defense mechanism that signals issues within the human body. Pain is highly individualistic, reflecting an individual's beliefs and responses to their experienced discomfort. In the context of orthopedic surgery, postoperative pain is characterized as acute, arising from tissue damage caused not only by surgical incisions but also by pre-existing trauma, such as orthopedic fractures (Suharyo *et al*., 2021) [16].

Nurses play a crucial role in pain management, addressing pain responses, and managing the side effects of pain relief therapies. To enhance the return of body function and alleviate pain, nursing interventions recommend early mobilization, involving joint motion training, gait exercises, and activity tolerance tailored to individual capabilities and body alignment (Murliana & Tahun, 2022) [11]. Exercise therapy and mobilization are effective modalities to restore body function to the injured part and the entire limb (Karyati *et al*., 2018) [9]. Exercise therapy may encompass passive and active exercises, transfer, positioning, and ambulation to enhance independent activity skills (Rustianawati *et al*., 2018) [15].

The research involving 64 respondents at Royal Prima Medan Hospital in 2024 indicates that after receiving early mobilization, the majority reported a slight increase in pain, while a minority experienced a further increase in pain levels. This suggests that while early mobilization benefits overall recovery, individual responses to pain may vary, emphasizing the need for personalized approaches to postoperative care.

The Effect of Early Mobilization on Pain Levels in Orthopedic Postoperative Clients at Royal Prima Medan Hospital in 2024

The results of the Wilcoxon Rank Test reveal a ρ-value of 0.002, which is less than the significance level (α) of 0.05. This indicates the rejection of the null hypothesis (H0) and

the acceptance of the alternative view (Ha), signifying that there is a significant effect of providing early mobilization on changes in pain among post-orthopedic surgery clients in the hospital rooms of Royal Prima Medan Hospital in 2024. These findings align with the research by Pristahayuningtyas *et al*. (2016) [5], demonstrating the impact of early mobilization on postoperative appendectomy clients at Baladhika Husada Hospital in Jember Regency (Caecilia & Pristahayuningtyas, Murtaqib, 2016) [5]. Another study by Berkanis *et al*. (2020) [4] supports these results, suggesting that early mobilization influences pain intensity in postoperative patients and can be considered a nursing intervention in managing postoperative pain. Early mobilization is a critical factor in expediting recovery and preventing complications after surgery, offering benefits such as improved blood circulation, reduced pain, thrombophlebitis prevention, enhanced nutrient delivery to wound areas, and improved kidney function (Berkanis *et al*., 2020) [4].

Conclusions

The research results at RSU Royal Prima Medan in 2024 showed that early mobilization effectively reduced pain levels in orthopedic patients. Most patients experienced a change to "Slightly More Pain" after implementing early mobilization. It is recommended that RSUs adopt early mobilization routinely, design protocols, provide training to healthcare workers, and encourage inter-professional collaboration. Monitoring patient outcomes, developing recovery programs, and disseminating policies and patient education are necessary to strengthen orthopedic care practices.

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