

ASSESSMENT OF EARLY MOBILITY PROTOCOLS ON PRESSURE ULCER
INCIDENCE IN POST-SURGICAL PATIENTSZainab Tanveer^{*1}, Anjum Rashid², Zakia Rehman³, Huma Manzoor⁴^{*1}BSN final year student Sheikh Fatima Institute of Nursing and Health Sciences Lahore²Vice Principal Sheikh Fatima Institute of Nursing and Health Sciences Lahore^{3,4}BSN final year student Sheikh Fatima Institute of Nursing and Health Sciences Lahore¹tanveerzainab614@gmail.com, ²anjumtanveer708@gmail.com, ³zakiyarehman4011@gmail.com,
⁴humah6226@gmail.comDOI: <https://doi.org/10.5281/zenodo.22706004>**Keywords**Early Mobility, Pressure Ulcer,
Post-Surgical Care, Nursing
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Copyright @Author**Corresponding Author: *****Zainab Tanveer****Abstract****Background:** Pressure ulcers represent a frequent and serious complication among post-surgical patients, primarily driven by prolonged immobility. While early mobility protocols are recognized as a key preventive strategy, their consistent implementation and definitive impact in clinical settings require further evaluation.**Aim:** This study aimed to determine the impact of early mobility protocols on the incidence of pressure ulcers in post-surgical patients.**Methods:** A quantitative, cross-sectional study was conducted at a tertiary care hospital with a sample of 108 post-surgical patients. Data were collected using an observation checklist and chart reviews to assess mobility adherence and pressure ulcer incidence. Statistical analysis was performed using SPSS version 27, employing descriptive statistics and chi-square tests.**Results:** The study found a statistically significant association ($p^* = 0.001$) between high adherence to early mobility protocols (≥ 3 activities) and a reduced incidence of pressure ulcers. Only 3% of patients in the high-adherence group developed ulcers, compared to 33% in the low-adherence group. While 77.8% of patients were assisted to sit within 24 hours, ambulation within 72 hours was achieved by only 64.8%. Key barriers to mobility included postoperative pain (62.0%) and fear of wound disruption (38.9%).**Conclusion:** Early mobility protocols are a highly effective intervention for preventing pressure ulcers in post-surgical patients. However, full compliance is hindered by patient-related and systemic barriers. A multidisciplinary approach addressing pain management, patient education, and staffing resources is essential for successful implementation.**1. INTRODUCTION:**

Early mobility protocols refer to structured, interdisciplinary postoperative care plans designed to encourage patient movement, including sitting, standing, and ambulation, as soon as it is medically safe. Pressure ulcers, also known as

pressure injuries, are localized damage to the skin and underlying tissues caused by sustained pressure or shear, typically over bony prominences. (Poldrugovac et al., 2021). Post-surgical patients are individuals recovering after

operative procedures, who are often at higher risk for immobility-related complications due to anesthesia, pain, and restricted movement. These keywords form the conceptual foundation for exploring how early mobility interventions may reduce the risk of pressure ulcers in surgical populations (Matlhaba, 2024).

1.1 BACKGROUND OF THE STUDY:

Pressure ulcers form a significant clinical issue of hospitalized and post-operative patients in the global environment. According to global research, the prevalence of pressure ulcers in surgical patients is a rapidly ranging value that depends on the nature of the patient, the length of the surgery, and the procedure (Poldrugovac et al., 2021). One in five adult patients is affected as a systematic review in Africa found a pooled prevalence of pressure ulcers of almost 20% (Anthony et al., 2021). Recent surgical and nursing care development does not eliminate the high rates and, therefore, the necessity of effective prevention measures, such as early mobility protocols (Almutairi et al., 2025). Surgical treatment usually makes patients stay in an immobilized position over long periods, which predisposes them to ischemia of tissues and skin breakdown. Delayed mobilization is greatly influenced by the long working hours, general anesthesia, and postoperative pain (Nancy et al., 2022). The research has indicated a direct correlation between the incidence of stage I and II pressure ulcers and extended periods of immobility and delayed repositioning (Langemo et al., 2022). Thus, early mobilization is the essential element of perioperative nursing that could help to mitigate the complications that can occur due to prolonged pressure.

The physiological processes that contribute to the formation of pressure ulcers are that, prolonged compression of tissues, impaired microcirculation, and the reduction of oxygen supply to the skin and the underlying structures (Gefen et al., 2022). These mechanisms are worsened by immobilization making it impossible to shift positions alleviating localized pressure. Patients who have undergone surgeries especially those under heavy sedation or in critical care are not able

to reposition themselves, which puts them at a higher risk. The introduction of early mobility protocol has been suggested as an evidence-based intervention to improve tissue viability and decrease cases of ulcer development (Peterson et al., 2025).

It is proven that there is a close connection between early mobility and the minimization of hospital-acquired complications, including pressure ulcers. Research has also shown that early mobilization of postoperative patients enhances blood flow, shortens hospitalization, and prevents pressure injuries (Chen et al., 2024). In the same way, early initiated evidence-based repositioning and graded nursing intervention proved to provide better patient outcomes and overall happiness (Iblasi et al., 2021). The study findings underscore the need to incorporate standardized early mobility programs into the surgical care pathways.

Early mobility interventions are effective in preventing pressure ulcers as well as speeding up the complete healing process. Ambulation of patients within the first hours postoperative period shows enhanced respiratory and cardiovascular functions, reduced wound healing, and reduced rates of deep vein thrombosis (World Health Organization, 2025). Mobilization is also associated with the improvement of psychological wellness as well as the decreased dependency, which leads to the improved outcomes of rehabilitation (Roussou et al., 2023). Nurses can significantly contribute to the implementation of the interventions, and education, motivation, and institutional support of the regular practice receive great importance (Noreen et al., 2025).

The barriers to the application of early mobility protocols are usually institutional and personal. The frequent issues involve insufficient staffing, absence of assistive equipment, and the fear of hurting patients during the process of mobilization (Avsar et al., 2021). It has been found that adherence to the policy of repositioning increases considerably when the focus is on interprofessional cooperation and ongoing employee education (Hernandez-Martínez-Esparza et al., 2021). Mobility initiatives can therefore only be maintained with effective leadership and

hospital management support (Almutairi et al., 2025).

Early mobilization has not been used extensively in surgical populations despite being seen to be beneficial. Most hospitals do not have specifications regarding when, how often, and how postoperative mobility should be initiated, which results in a lack of uniformity in practices (Gefen, 2024). In developing nations, research has observed a slow mobilization process because of the old-fashioned care practices, ineffective training, and lack of resources (Noreen et al., 2025). Incorporation of an organized guide early mobility protocol might help close this loophole and decrease the rate of pressure ulcer among postoperative patients.

The problem of pressure ulcers remains a significant problem to surgical nursing. The early mobility protocol proposes an inexpensive, noninvasive approach that aims at reducing one of the most alterable risk factors, which is immobility. It is important to assess the effectiveness of these protocols in preventing pressure ulcers in patients in the post-surgical unit to create evidence-based guidelines to improve patient outcomes, decrease hospital expenditure, and improve the quality of care (Gefen et al., 2022).

1.2. PROBLEM STATEMENT:

The problem of pressure ulcers in the postoperative period is still a major clinical issue in healthcare, especially when patients are immobilized because of extended periods of postoperative care. Regardless of the improvement in surgical practices and nursing interventions, the prevalence of pressure ulcers in the post-surgical patients remains high, and this increases patient distress, morbidity, treatment expenses, and nursing workload. Early mobility protocols have already been discovered as a useful intervention that can minimize the number of complications related to immobility, but the use of them in surgery is not always consistent because of insufficient staffing, a lack of awareness, and the lack of standardized guidelines. The urgency to assess the usefulness of early mobility guidelines in preventing pressure ulcers in the post-surgical

patients to deliver evidence-based guidelines on enhancing postoperative nursing care and patient safety is evident.

1.3. OPERATIONAL DEFINITIONS:

Early Mobility Protocols:

Structured, evidence-based interventions that encourage patients to begin physical movement such as sitting, standing, and ambulating as soon as medically feasible after surgery. These protocols are implemented by nurses and physiotherapists to enhance circulation, prevent complications, and promote faster recovery (Lillekroken et al., 2024).

Pressure Ulcer:

A localized injury to the skin and/or underlying tissue, usually over a bony prominence, resulting from sustained pressure, friction, or shear. In this study, a pressure ulcer will be defined according to the National Pressure Injury Advisory Panel (NPIAP) staging system, identified during postoperative assessment (Hookmani et al., 2021).

Post-Surgical Patients:

Individuals who have undergone surgical procedures and are in the postoperative phase of hospital care, receiving recovery support including wound management, mobility assistance, and monitoring for complications (Matlhaba, 2024).

Incidence:

The number of new cases of pressure ulcers that develop among post-surgical patients during the study period, expressed as a percentage of the total number of patients observed (Keinänen et al., 2023).

1.4. OBJECTIVES OF THE STUDY:

✓ To evaluate the impact of early mobility protocols on the incidence of pressure ulcers among post-surgical patients in hospital settings.

1.5. AIM OF THE STUDY:

The aim of this study is to determine the impact of early mobility protocols on the incidence of pressure ulcers among post-surgical patients.

1.6. RESEARCH QUESTION OF THE STUDY:

What is the impact of early mobility protocols on the incidence of pressure ulcers among post-surgical patients?

1.7. RATIONALE OF THE STUDY:

The pressure ulcers can be defined as one of the most common and avoidable yet frequent complications of post-surgical patients, and it may be caused by long-term immobility and the lack of proper after-operation treatment. Pre-mobilization measures have also been identified as being effective to increase circulation, tissue perfusion, and decrease immobility-related complications. Nonetheless, their use case in surgical wards is not as consistent as it should be because of differences in nursing practice and institutional policy. This research is carried out as it will assess the effects of early mobility interventions on pressure ulcer incidence among patients after surgery, seek to avail evidence on the inclusion of structured mobility interventions as part of postoperative nursing practice. The results will serve to enhance evidence-based nursing, ensure patient safety, prevent pressure injuries in hospitals, and encourage healthcare facilities to adopt the standardized and early mobility measures to enhance recovery outcomes.

2. LITERATURE REVIEW:

Pressure ulcers or pressure injuries are one of the significant healthcare-related issues in the world, especially in post-surgical and immobile patients. As suggested by Peterson, Fraix, and Agrawal (2025), these ulcers occur mostly because of the unrelieved pressure, friction, and shear forces that undermine the tissue integrity and blood flow. Although technology has advanced in the healthcare sector, they still remain a major challenge even in surgical and critical care units. As VanGilder et al. (2021) highlighted, the prevalence rates of pressure ulcers in the world are dispersed, and the most vulnerable groups include surgical and immobilized patients, as they are forced to spend much time in bed and have delayed mobility post-operation.

According to Cox et al. (2022), pressure ulcers continue to be a common complication in critical care patients, and the most common causes of this issue are immobility and hemodynamic instability. The authors have observed that clinical compliance with preventive guidelines in spite of risk factor awareness is frequently not consistent. Likewise, Siotos et al. (2022) emphasized the burden of pressure injuries on the population worldwide, with the authors stating that the issue causes a high morbidity, mortality, and healthcare expenses. This highlights the need to have standardized prevention solutions and evidence-based nursing interventions.

Almutairi et al. (2025) have considered pressure ulcer prevention best practices, and the focus should be on early mobilization and frequent repositioning to decrease tissue ischemia and improve the circulation. The review showed that pressure injuries can be prevented by the proactive nursing care, including the structured mobility protocols. The results of Alrwaili et al. (2024) were corroborated by the researcher who demonstrated that timely ambulation, proper positioning, and turning regularly were among topics that were targeted in nursing interventions to lower the presence of pressure ulcers in long-term residences.

One risk factor that has been well documented amongst postoperative patients is immobility. Li et al. (2024) also reported that pain and the fear of wound disruption are some of the reasons that hinder early movement among patients who have undergone anesthesia or major surgery. The effects of these challenges make one more susceptible to tissue damage. The authors have indicated that early mobility programs, which are structured and started immediately patients have become clinically stable, are effective in improving recovery and reducing pressure-associated complications. In the same way, Iblasi et al. (2021) have found that compliance with repositioning policies is determined by the compliance of the staff, workload, and institutional support, which affect patient outcomes directly.

It is now understood that nurses should play a critical role in the prevention of pressure ulcers because of frequent repositioning, early mobility,

and skin evaluation (Noreen et al., 2025). The research concluded that prevention strategies should be implemented with the help of nursing education, adequate staffing, and interprofessional collaboration. Iblasi et al. (2024) also noted that decision-making and critical thinking among nurses contribute tremendously to compliance with repositioning policies and quality of care indicators.

Social determinants are also important in the prevention of pressure ulcers. According to Ahmed Abdel Mowla et al. (2022), well-organized tools like turn clocks or visual reminders may prompt healthcare workers to reposition patients on a regular basis, which results in a significant decrease in the number of hospital-acquired pressure ulcers. Along this line, Peterson et al. (2025) emphasized the importance of involving leadership, supportive hospital policies, and ongoing staff education as a way of maintaining preventive efforts and ensuring patient safety.

Early mobility practices can also be impeded by factors that are related to the patient. Noreen et al. (2025) suggest that postoperative pain, fatigue, and anxiety may lead to discouragement and reduce the rehabilitation process, which will put the patient at risk of pressure ulcers. On the same note, Li et al. (2024) observed that these obstacles can be addressed with the help of individualized repositioning frequency and patient-centered care models, which involve the ability to customize interventions based on the tolerance and recovery level of each patient.

There has also been evidence of holistic benefits of early mobilization in addition to the prevention of pressure ulcers. Triantafyllou et al. (2021) concluded that the postoperative early ambulation brought about better respiratory and cardiovascular functions, wound healing, and shorter hospitalization. Alrwaili et al. (2024) also included that mobility interventions would help to achieve greater levels of psychological well-being and confidence that stimulates faster recovery and an increase in the level of satisfaction in post-surgical patients.

The management and occurrence of pressure ulcers are an issue of concern in the context of Pakistan. Shah et al. (2025) have stated that a large

number of tertiary hospitals do not have formal prevention programs, instead of the structured evidence-based interventions, they use traditional nursing routines in their work. Mostafa et al. (2025) attributed this gap to lack of proper staff training, insufficiency of resources and lack of a standardized monitoring system. These systemic obstacles have the effect of obstructing the adoption of viable early mobility policies which have led to long period of recovery and high medical expenses.

In general, the existing literature shows that early mobility is one of the most effective, cheap, and evidence-based strategies to prevent pressure ulcers in surgical and immobile patients. The inclusion of formal mobility and repositioning regimens in the postoperative care is not only effective to enhance patient outcomes but also to advance nursing practice (Peterson et al., 2025). The focus on nurse education, interprofessional cooperation, and policy formulation is the key to attaining sustainable prevention results and minimizing the pressure injury-related burden on the global and local levels.

3. METHODOLOGY

3.1. STUDY SETTING:

The study was carried out at **Sheikh Zayed Hospital, Lahore**, one of the major tertiary care hospitals in Punjab, Pakistan. The hospital was chosen because it provides a variety of surgical services, has a large postoperative patient population, and maintains a structured nursing care system, making it suitable for studying postoperative mobility practices.

3.2. STUDY DESIGN:

The study was conducted using a quantitative, descriptive cross-sectional design. This design was selected to assess the impact of early mobility protocols on the incidence of pressure ulcers among post-surgical patients. The design allowed the researcher to gather numerical data related to mobility practices and pressure ulcer occurrence within the hospital setting during the study period.

3.3 STUDY POPULATION

The target population of the study consisted of post-surgical patients admitted to surgical wards at Sheikh Zayed Hospital. These patients were in their postoperative phase of recovery and received standard nursing care, including postoperative monitoring and mobility assistance.

3.4. SAMPLE SIZE:

The total population of post-surgical patients during the study period was **150**. The sample size was calculated using the **OpenEpi Sample Size Calculator**, ensuring an appropriate representation of the target population with a 95% confidence interval and a 5% margin of error. Based on these parameters, the calculated sample size was **108 participants**. Considering the drop out attrition rate of 10%.

3.5. SAMPLING TECHNIQUE:

A **convenience sampling technique** was used to select participants who met the inclusion criteria and were available during the data collection period.

3.6. SAMPLE SELECTION:

3.6.1. Inclusion Criteria:

- ✓ Patients who had undergone surgical procedures and were in the postoperative recovery phase were included.
- ✓ Participants were required to be 18 years or older.
- ✓ Only conscious and physically capable patients able to participate in early mobility interventions were included.
- ✓ Patients who provided informed consent to participate were included in the study.

3.6.2. Exclusion Criteria:

- Patients with pre-existing pressure ulcers were excluded.
- Those admitted to intensive care units (ICUs) were excluded.

- Patients with unstable vital signs or medical conditions contraindicating mobility were excluded.

- Patients who were unwilling to participate were also excluded from the study.

3.7. DATA COLLECTION PROCEDURE:

Data were collected over a period of four weeks. The researcher obtained permission from the hospital administration prior to data collection. Participants were approached in the surgical wards, and informed consent was obtained. The researcher observed patient mobility practices and recorded relevant data using the observation checklist. Patient charts and skin assessments were reviewed to identify any signs of pressure ulcer development during the hospital stay

3.8. DATA ANALYSIS PROCEDURE:

Data were entered and analyzed using Statistical Package for the Social Sciences (SPSS) version 27. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to summarize demographic variables and study findings. Inferential statistics, including chi-square tests, were applied to determine the association between early mobility and pressure ulcer incidence. The level of significance was set at $p < 0.05$.

3.9. ETHICAL CONSIDERATIONS

Ethical approval for the study was obtained from the **Institutional Review Board (IRB) of Sheikh Zayed Hospital, Lahore**. Permission to collect data was also granted by the hospital administration. Participants were informed about the purpose of the study, and written informed consent was obtained. Confidentiality and anonymity were maintained throughout the study. The participants were assured that their decision to participate or withdraw would not affect their care in any way.

4 RESULT AND ANALYSIS:

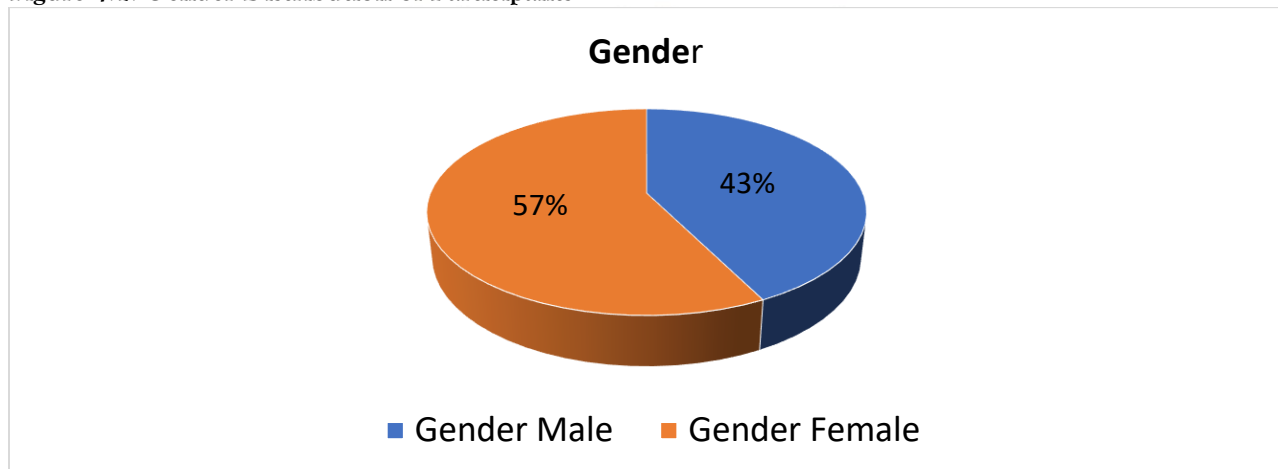
Table 4.1 Demographic Characteristics of Participants (n = 108)

Variable	Categories	Frequency (n)	Percentage (%)
Gender	Male	46	42.6
	Female	62	57.4
Age (years)	18-30	28	25.9
	31-45	40	37.0
	46-60	30	27.8
	>60	10	9.3
Type of Surgery	General Surgery	38	35.2
	Orthopedic Surgery	28	25.9
	Abdominal Surgery	26	24.1
	Other	16	14.8
Duration of Hospital Stay	<5 days	42	38.9
	5-10 days	52	48.1
	>10 days	14	13.0

The results showed that most participants were female (57.4%) and aged between 31-45 years (37.0%). The majority of surgeries were general (35.2%) and orthopedic (25.9%) in nature. Nearly half of the patients (48.1%) remained hospitalized

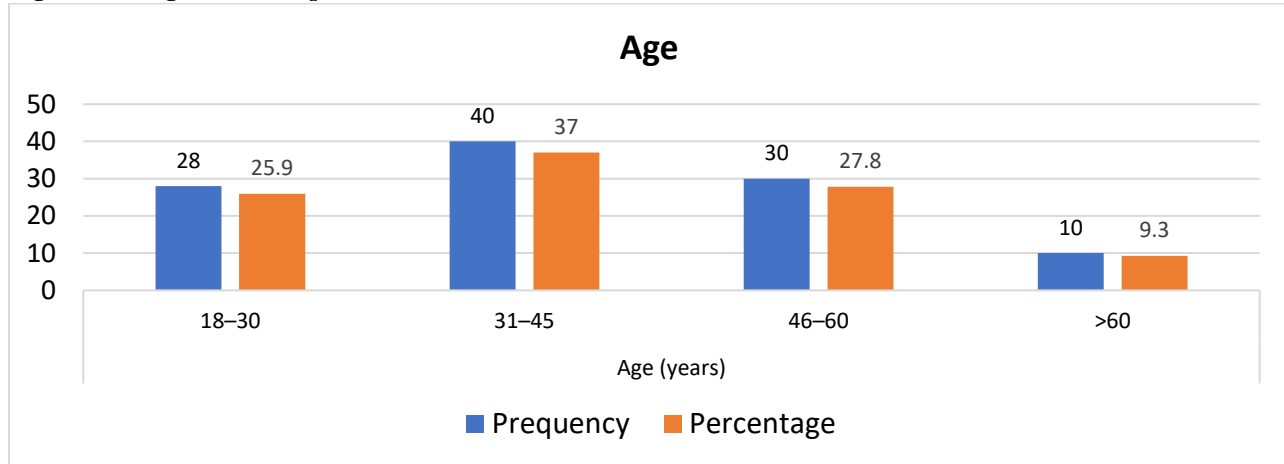
for 5-10 days after surgery. The demographic distribution indicated a balanced representation across surgical types and age groups. These characteristics provided a reliable baseline for assessing postoperative outcomes.

Figure 4.1. Gender Distribution of Participants



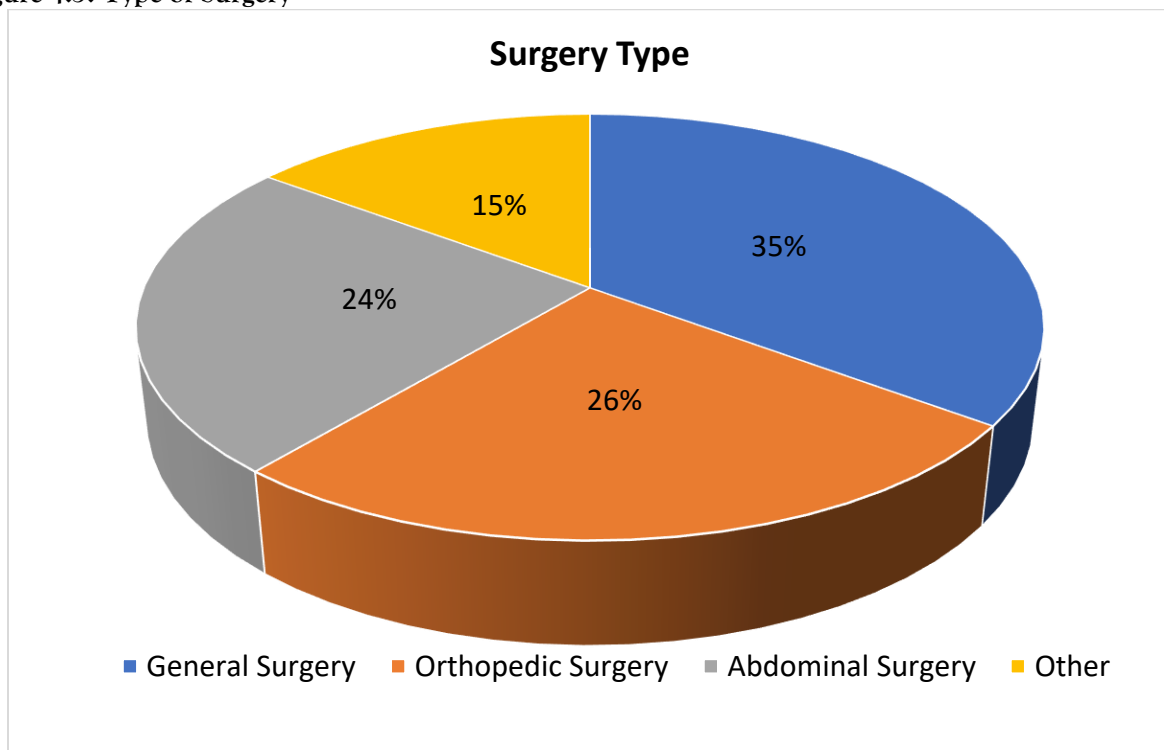
The data shows a female majority, comprising 62 individuals or 57.4% of the total. Males represent the minority, with 46 individuals making up the remaining 42.6%.

Figure 4.2. Age of Participants



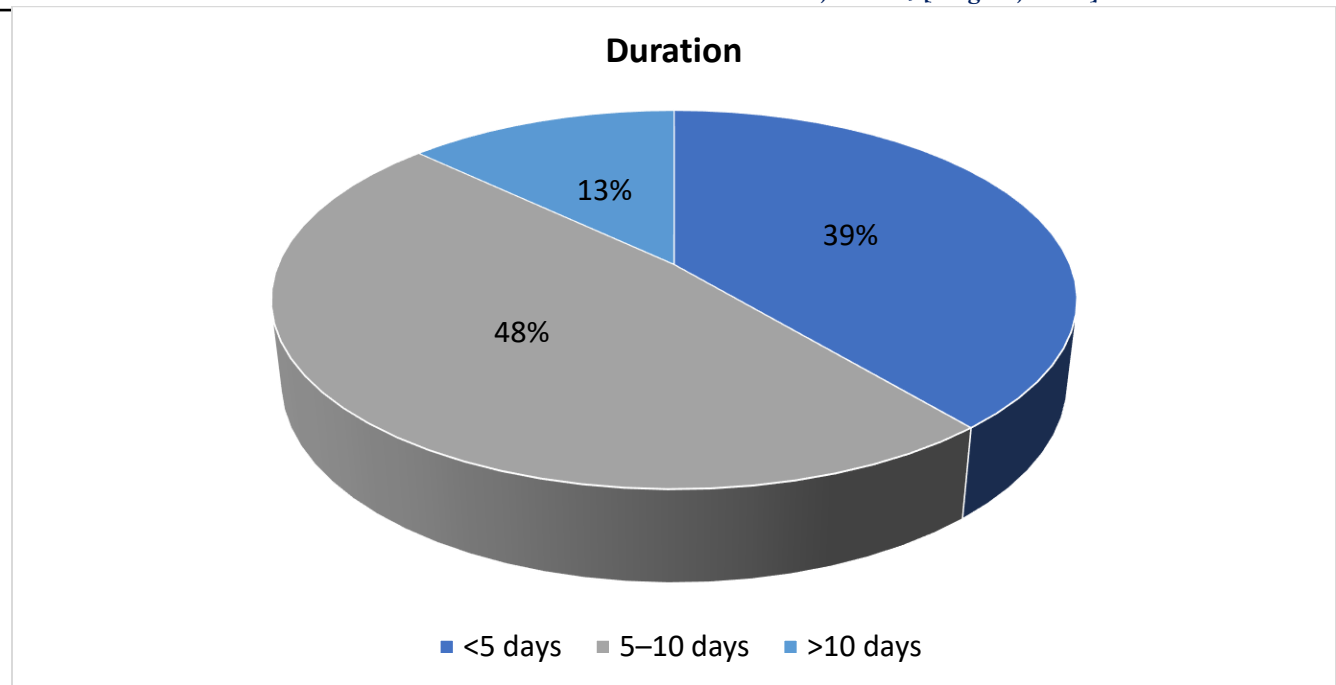
The 31-45 age group is the largest cohort, representing 37.0% of the total. The population is predominantly composed of younger and middle-aged adults, with those over 60 forming the smallest segment at 9.3%.

Figure 4.3. Type of Surgery



General Surgery was the most common procedure, accounting for 35.2% of cases. Orthopedic and Abdominal surgeries were also frequent, making up a combined 50% of the total.

Figure 4.4: Duration of Hospital Stay



The vast majority of patients (48.1%) had a hospital stay of 5-10 days. Shorter and longer stays were less common, at 38.9% and 13.0% respectively.

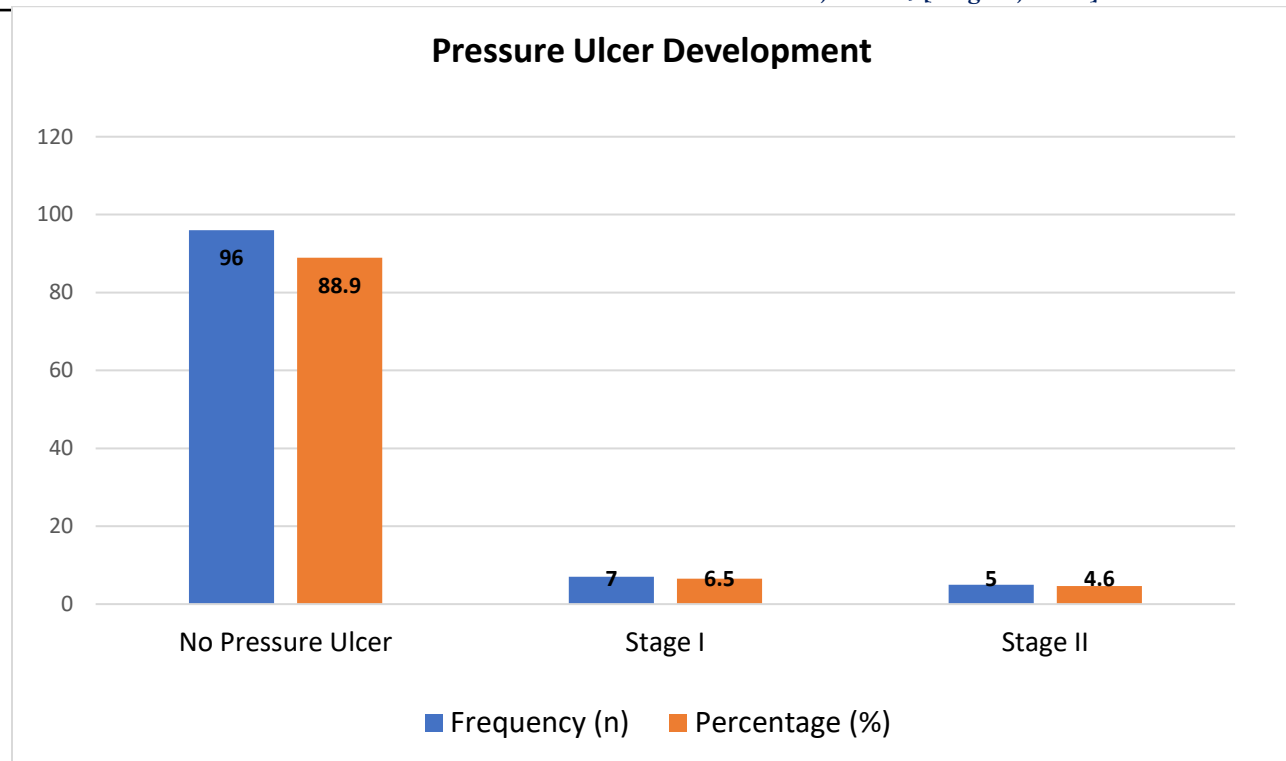
Table 4.2 Implementation of Early Mobility Protocols (n = 108)

Mobility Activity	Yes (n, %)	No (n, %)
Assisted sitting within 24 hours post-surgery	84 (77.8)	24 (22.2)
Standing within 48 hours	79 (73.1)	29 (26.9)
Ambulation within 72 hours	70 (64.8)	38 (35.2)
Daily range-of-motion exercises	88 (81.5)	20 (18.5)
Nurse supervision during mobilization	91 (84.3)	17 (15.7)

The findings indicated that 77.8% of patients were assisted to sit within 24 hours of surgery, and 73.1% were able to stand within 48 hours. Ambulation within 72 hours was achieved by 64.8% of patients, while 81.5% performed range-of-motion exercises. Nurse supervision was

reported in 84.3% of cases, suggesting strong nursing involvement. The overall adherence rate demonstrated that early mobility was widely practiced but not fully implemented among all patients.

Figure 4.5 Pressure Ulcer Development



Out of 108 participants, 88.9% did not develop pressure ulcers, while 11.1% developed pressure injuries (6.5% Stage I and 4.6% Stage II).

Table 4.3 Relationship Between Early Mobility and Pressure Ulcer Incidence (Chi-square Test)

Early Mobility Implementation	No Pressure Ulcer (n = 96)	Pressure Ulcer (n = 12)	χ^2	df	p-value
High adherence (≥ 3 activities)	78	3	12.46	1	0.001
Low adherence (< 3 activities)	18	9			

The chi-square test demonstrated a statistically significant association between early mobility and pressure ulcer prevention ($p = 0.001$). Patients who participated in three or more mobility activities had a lower ulcer rate (3%) compared to those with fewer activities (9%). The results indicated

that greater adherence to mobility protocols effectively reduced skin breakdown. These findings support early mobilization as a critical preventive strategy. The analysis confirmed the protective role of movement against postoperative complications.

Table 4.4 Factors Affecting Early Mobility Compliance (n = 108)

Barriers Reported	Frequency (n)	Percentage (%)
Postoperative pain	67	62.0
Fear of wound disruption	42	38.9
Lack of staff assistance	28	25.9
Fatigue and weakness	31	28.7
Inadequate knowledge about mobility	24	22.2

The study identified postoperative pain (62%) and fear of wound disruption (38.9%) as the leading

barriers to early mobilization. Other reported factors included fatigue (28.7%), lack of staff

assistance (25.9%), and inadequate patient knowledge (22.2%). These findings highlight both physical and organizational challenges to mobility adherence. Effective pain control and patient education could improve compliance. The data underscore the need for a multidisciplinary approach to strengthen mobility practices.

5 DISCUSSIONS OF THE STUDY:

The research is informative in terms of how early mobility protocols can be implemented and their effects on a postoperative population, and some of the results are consistent and inconsistent with the available literature. Our sample is composed of the majority of female and middle-aged people, which is expected to follow the trends of the previous research on the population of surgical patients, where the same age and gender distribution patterns have been revealed (Gibelli et al., 2022). The high percentage of nurse-monitored mobility (84.3) and other activities, including assisted sitting (77.8), indicate that the institutions were more committed to postoperative mobilization than the previously reported literature that indicates the presence of significant gaps between the policies of prevention and bedside practice (Akyuz et al., 2022).

One of the main conclusions of the study is the statistically significant correlation ($p = 0.001$) between the high compliance with the early mobility activities and low prevalence of the pressure ulcers. This finding adds to a large body of research that highlights the importance of timely repositioning and mobilization as important factors in pressure injury prevention (Asiri, 2023). The high disparity in the rate of ulcer among the high-adherence (3%) and low-adherence (33) groups indicates the effectiveness of early mobility as a preventive measure, which is supported by the finding of the large-scale prevalence studies that immobility is a significant etiological factor in the development of ulcers (Cox et al., 2022).

Although positive results were obtained, the study also found that complete adherence to early mobility interventions is still difficult since ambulation within 72 hours was only obtained in 64.8 percent of patients. This observation is in line

with the practical challenges that have been reported in the previous surveys of the surgical care, with elements like pain, exhaustion, and patient anxiety restricting mobility despite set clinical guidelines (De Cassai et al., 2022). The barricade of postoperative pain (62.0%) is also a reflection of previous studies that underline the idea that patients need pain management as a comfort tool and a vital part of pressure ulcer prevention (Chien & Tsai, 2024).

Moreover, the stated fear of wound disruption (38.9%) is another indicator of the significance of the pre- and postoperative education of patients to become familiar with the misconceptions and fears related to the issue of early mobility. This has been noted in other research in which improvement of participation rates in mobility interventions occurred in the case of increased engagement in counseling and patient engagement programs (Gefen et al., 2022). The shortage of staff assistance (25.9%) mentioned in the current study also does not contradict the issues of insufficient nursing resources and the workload load, which is an unchanging motif in the literature about the barriers to the implementation of early mobility (Anthony et al., 2021).

The total pressure ulcer prevention (88.9% not injured) is compared positively to the international and regional data since the prevalence among hospitalized or surgical populations is usually higher (Cox et al., 2022; Anthony et al., 2021). The fact that only the Stage I and II ulcers were identified means that the early and appropriate intervention was working, but, still, it is crucial to exercise constant attention. This finding underpins the view that early mobility, accompanied by a set of repositioning measures, constitutes a critical component of the whole-fledged prevention measures (Asiri, 2023). Moreover, the interdependency of patient-related obstacles (e.g., pain and fear) and systemic issues (e.g., staffing and workload) suggests the multifactorial etiology of pressure ulcers. As Gefen et al. (2022) point out, the pathophysiology of the development of pressure injuries is intricate, and it consists of biological and mechanical processes that are enhanced by the absence of movement

and insufficient support. Consequently, effective prevention demands interventions that help to cover both clinical and educational and organizational levels.

These results are also consistent with neurosurgical and critical care research, where the mobility and positioning of patients are the most important factors influencing the postoperative outcomes (De Cassai et al., 2022; Cox et al., 2022). The results of this research underline the idea that structured early mobility cannot be a pivotal element of nursing practice but it is a part and parcel of patient safety measures. Equally, Akyuz et al. (2022) emphasize that bibliometric analyses of trends in the world research indicate an increasing agreement on the concept of early mobility as a changeable mechanism that can help prevent the global pressure ulcer burden.

Principally, this paper supports the strong evidence that early mobility is the determinant of pressure ulcers prevention in postoperative patients. It can also be used to measure local adherence rates and reveal major barriers, which allows pointing out the areas that require specific improvement, specifically, improved pain management, reassurance of patients and the provision of sufficient staff support. In line with the findings of global reviews, an intervention based on a multidisciplinary method is to be used in the future, including patient education, organized mobility plans, and sufficient resource allocation to improve compliance and reduce the likelihood of pressure-related complications (Gibelli et al., 2022; Asiri, 2023).

6 CONCLUSION AND RECOMMENDATIONS OF THE STUDY:

6.1. CONCLUSION:

In conclusion, this study confirms the critical role of early mobility as a protective factor against postoperative pressure ulcers, demonstrating a statistically significant reduction in incidence among patients with high protocol adherence. However, the findings reveal a consequential gap between protocol existence and its consistent execution, primarily hindered by patient-centered barriers such as pain and fear, as well as systemic issues like staffing constraints. The study

ultimately underscores that the successful prevention of complications is not solely dependent on the intervention itself but on a holistic clinical environment that enables its application.

6.2. RECOMMENDATIONS OF THE STUDY:

Based on the study findings, the following recommendations are proposed:

1. **Enhance Pain Management and Patient Education:** Implement a structured pre-operative and post-operative education program that clearly explains the benefits and safety of early mobility, specifically addressing fears of wound disruption. This should be coupled with a proactive, multimodal pain management regimen to ensure patient comfort and willingness to mobilize.

2. **Strengthen Nursing Protocols and Resources:** Develop and integrate a standardized, tiered mobility checklist into the electronic health record to prompt and track patient progression from sitting to ambulation. Furthermore, hospital administration should conduct a workload assessment to ensure adequate nurse-to-patient ratios, facilitating the necessary supervision and assistance for mobilization.

3. **Promote a Multidisciplinary Approach:** Formalize the roles of a multidisciplinary team, including physicians, physiotherapists, and nurses, in the mobility process. Instituting daily "mobility huddles" for high-risk patients can help set daily goals, assign responsibilities, and overcome identified barriers collaboratively, ensuring a consistent and supported mobilization plan for every patient.

6.3. STRENGTH OF THE STUDY

This research has a number of significant strengths, which make its findings more valid and applicable. First, the analyses performed with a good sample size (n=108) offers the necessary statistical strength to the studies that aim to assess the truthfulness of the observed relationships such as the strong correlation between early mobility and pressure ulcer minimization. Second, the internal validity is reinforced by the use of a standardized data collection tool, as well as objective and clinically relevant outcome measures

(e.g., stage of pressure ulcer) that reduce measurement bias. Moreover, the study provides a holistic perspective since not only the results of the protocol are considered but also the real factors that influence its implementation as viewed by the patient. This dual emphasis on both efficacy and barriers in the real world is very useful and practical to clinical practice beyond merely finding a correlation towards offering an insight on possible ways to enhance patient care and protocol compliance.

6.4. LIMITATIONS OF THE STUDY:

This study has a number of limitations even though it has valuable findings. First, it is cross-sectional in nature, which means that it only collects data at one time and these data cannot in any way prove the causal relationship between early mobility and pressure ulcer prevention. Secondly, the study was carried out in only one institution and the sample, however, strong, might not be entirely representative of surgical population in general and may not be generalizable to other clinical settings with different protocols or patient population. Moreover, patient self-reporting and chart reviews to access the data on the adherence to mobility and few barriers (e.g., pain, fear), brings up the possibility of recall and reporting bias. All potential confounding factors were not also controlled in the study, including differences in the personal nutrition of each patient, particular anesthesia protocols, or utilization of special pressure-redistributing support surfaces, that might have contributed independently towards the occurrence of pressure injuries. It would be beneficial to use a longitudinal, multi-centric study in future research that has included more objective measures of mobility and has been better able to control a greater number of clinical confounders.

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