Nurse-Led Care Plan on Detecting Surgical Site Infection by Clinical Predictors, Length of Stay, and Patients' Satisfaction

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Abstract

Background: Surgical site infections significantly contribute to prolonged hospital stays, higher healthcare costs, and reduced patient satisfaction, particularly in resource-limited settings. It accounts for nearly 40% of all healthcare-associated infections among general surgical patients and is associated with a mortality rate of 70%. Additionally, it leads to extensive length of stay as well as affects patient satisfaction.

Aim: To assess the impact of nurse-led care on detecting surgical site infections, length of stay, and patient satisfaction. Moreover to explore the relationship between these variables.

Methods and Materials: This quasi-experimental study utilized purposive sampling to recruit 50 laparotomy patients from a teaching hospital in Lahore, 25-participants in control (intervention withheld) and 25 in intervention groups. Data collected using checklists and an adopted questionnaire and analyzed using SPSS 23.

Results: The study signifies benefits of the intervention, lowering surgical site infections, particularly fever (16% vs. 56%), drainage (8% vs. 40%), and abscesses (12% vs. 52%), with $\mathbf{p < 0.05}$ confirming statistical significance. About 60% of the intervention group accounted for shorter lengths of stay, while 24% of the control group did. Satisfaction scores slightly favored the intervention group (3.80 vs. 3.68), though not statistically significant ($\mathbf{p = 0.458}$). Notably, the intervention group showed a strong positive correlation ($\mathbf{r = 0.686, p < 0.01}$) between severe wounds and satisfaction, unlike the control group, which revealed a negative trend ($\mathbf{r = -0.422, p < 0.05}$).

Conclusion: Nurse-led care plans significantly reduced surgical site infections, shortened hospital stays, and improved outcomes. Further research should be done on a larger scale.

Keywords: Laparotomy, Length of stay, Nurse-led care plan, Patient satisfaction, Surgical site infections.

Introduction

Quality nursing care is the backbone of effective healthcare systems worldwide. For general surgery patients, the need for specialized nursing care is even more pronounced due to the invasive nature of these procedures and the heightened risk of postoperative complications. Each patient presents unique challenges, and personalized nursing care plans are essential in addressing these individual needs. By tailoring care plans to specific patient conditions, nurses can mitigate potential risks, promote faster recovery, and ensure optimal health outcomes [1]. In a world where patient satisfaction is a key indicator of healthcare quality, the role of nurses in providing compassionate, competent, and personalized care is more critical than ever [2].

Healthcare professionals, particularly nurses, play a pivotal role in this pursuit by integrating evidence-based practices into daily care routines [3]. For instance, implementing standardized post-surgical care protocols can reduce complications, shorten hospital stays, and increase patient satisfaction rates worldwide [4].

Nursing Care Plans (NCPs) have undergone significant evolution, transforming from simple checklists to comprehensive, evidence-based frameworks that guide nursing practice. Ida Jean Orlando's foundational definition of NCPs describes them as structured, consistent sets of treatments and interventions tailored to meet each patient's specific healthcare needs [5,6]. The nursing specialty involves implementing initiatives that improve health outcomes and applying evidence-based recommendations to global practice contexts [7].

A surgical site infection (SSI) is an infection that develops in the area of the body where a surgical procedure was performed. SSIs are a significant concern in healthcare because they can lead to delayed healing, prolonged hospital stays, increased medical costs, and in severe cases, life-threatening complications. The risk of developing an SSI depends on various clinical predictors, including the patient's overall health, the type of surgery performed, the sterility of the surgical environment, and postoperative care protocols [8]. According to Alsareii [9] the prevalence of surgical site infections varies widely across healthcare settings, with reported rates ranging from 2.5% to 41.9% globally. In the United States, SSIs affect between 2% and 5% of the 16 million individuals undergoing surgery each year, making it one of the most common healthcare-associated infections. These infections not only extend hospital stays but also increase healthcare costs and put patients at risk for further complications, including additional surgeries and long-term health issues.

Sattar [10] conducted a survey in Pakistan that revealed SSIs affect 33.68% of patients, with 32 out of 95 individuals experiencing these infections. The risk increases significantly in older adults, as 44.4% of patients over 60 years old develop SSIs. Additionally, the prevalence is noticeably higher in urban areas (52.77%) compared to rural regions (32.20%). Another major concern in surgery is postoperative pulmonary complications (PPCs), such as pneumonia and atelectasis, which often present with cough and fever. The primary cause of these complications is immobility, contributing to 5–30% of cases [11].

Aubert [12] termed the length of hospital stay (LOS) as the time frame a patient remains in the hospital on the whole from admission to discharge. It serves as an important indicator of the severity of a medical condition and the complexity of treatment required. Hospitalized multimorbid patients are more likely to entail

specialized treatment, more nursing personnel, and a longer length of stay. According to the study, prolonged stays in the hospital might be caused by a lack of discharge planning, challenges with self-care, or limited mobility [13]. A study of surgical patients admitted to a certain hospital revealed that the 75th percentile required at least 33 days of stay, whereas the predicted duration of stay was 25.3%. Patients who had surgery but did not develop an infection at the surgical site had a mean postoperative hospital stay of 6.3 days, whereas those who did had a longer stay of 16.2 days [14].

Patient satisfaction measures how content individuals feel with healthcare services, including interactions with doctors, nurses, and hospital staff. A study found overall patient satisfaction at 65%, with 51% in public hospitals and 75% in private hospitals. Satisfaction scores varied, with 63% for hospital staff manners, 56.5% for the hospital environment, 67% for physician treatment, 63% for general satisfaction, and 58% for family care [15].

Patient satisfaction with quality of nursing care varies worldwide, Italy has 77.6%, Turkey 54.8%, and India has 91% whereas 77%-79.7% has been observed in different states of Ethiopia. According to the Pakistan study, 78.5% of patients in medical and surgical wards were satisfied with how nurses took their vital signs. In contrast, more than 50 percent of respondents indicated dissatisfaction or only minor satisfaction with the amount of knowledge nurses delivered about their health and treatment progress [16, 17].

General surgery is a medical specialty that focuses on surgical procedures involving the abdomen, including the gastrointestinal tract, liver, gallbladder, appendix, hernias, colorectal conditions, and oncology-related surgeries. A laparotomy is a specific type of general surgery that requires making an incision in the abdominal wall to access internal organs. The global burden of general surgery and laparotomy is substantial, as these procedures are widely performed to address various medical conditions. Emergency laparotomies, however, pose a significantly higher risk, with mortality and complication rates up to five times higher than elective surgeries. Statistics show that mortality rates range from 13–18% within 30 days and can increase to 25% within 24 months. Ensuring early intervention, improved surgical techniques, and post-operative care can help reduce these risks and improve patient outcomes [18].

Surgical site infections (SSIs) are a significant concern, accounting for about 40% of all hospital-acquired infections (HAIs) in general surgical patients. Alarmingly, SSIs contribute to 77% of all deaths among affected individuals. Researchers found that 5% to 20% of SSIs lead to prolonged hospital stays, eventually demoting patient satisfaction and intensifying healthcare burdens. It has also been observed that approximately 5%-20% of these infections cause an increase in length of stay during hospitalization as well as ultimately tend to lower the patient satisfaction level [18].

In today's healthcare landscape, identifying early signs of surgical site infections (SSIs) is essential for improving patient outcomes, shortening hospital stays, and enhancing overall recovery experiences. This study explores whether a nurse-led care plan for laparotomy patients can help detect SSIs sooner by utilizing key clinical predictors. Additionally, it examines how early detection influences hospital stay duration and patient satisfaction levels.

Materials and Methodology

This study employs a quasi-experimental, non-randomized case-control approach carried out at the department of general surgery, a teaching hospital, Lahore. A non-probability purposive sampling technique was used to select the participants. The study participants were comprised of 20 nurses working in the department of general surgery that remained the same before and after intervention whereas total 50 laparotomy patients were recruited, patients hospitalized before the interventions implied were classified as the control group, while those admitted after the intervention were categorized as the intervention group. This study initiated on March, 2024 and completed in November, 2024.

In this study, three tools were applied after reviewing from five experts. The first one is self-developed clinical predictors of surgical site infection performa which was utilized for the assessment of the surgical site infection by clinical predictors. The second tool was a patient's length of stay log-sheet to determine the patients' hospitalized duration, and the third one was an adopted questionnaire to assess the patient satisfaction with nursing care quality that is used to assess the patients experience with the nursing care quality they acquire throughout hospitalization.

Reliability and Validity

The reliability of clinical predictors of surgical site infection performa and length of stay log sheet was calculated by reliability testing that yielded Cronbach's alpha value of 0.876 while patient satisfaction with the nursing care quality questionnaire (PSNCQQ) value was 0.884. The content validity index of clinical predictors of surgical site infection performa and length of stay log sheet was calculated 0.86 whereas PSNCQQ was 1.00

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Data Collection Procedure

This section provides a detailed overview of the process used to measure the variables involved in the study. An adopted questionnaire PSNCQQ was used to assess the patient satisfaction level prior intervention from the control group participants that contain demographic data as well as 20 items relevant to patient satisfaction regarding nursing care quality. The laparotomy patients were split into two groups (control-group and intervention group) and each group involves different participants though the nursing participants were remained the same.

Prior to initiating the educational program, data collection took place during the first two months. This initial phase provided baseline data, which was later compared with post-intervention results to evaluate the program's effectiveness. The checklists for the assessment of clinical predictors of surgical site infection and length of stay were attached in the selected 25-patients' file as this study included general surgery patients admitted for exploratory laparotomy. The participants' selection was based on eligibility criteria. After clarifying their concerns, a consent form was signed from them. To gather patient insights, the researcher used an adapted version of PSNCQQ. The questionnaire was administered to participants at the time of discharge to assess their satisfaction with the nursing care they received. Participants were given thirty minutes to complete the questionnaire, ensuring they had sufficient time to reflect on their hospital experience.

During this period the selected general surgery department nurses were provided with interactive teaching sessions through a teaching module plan about study variables by incorporating the components of nursing process, infection prevention & safety

measures, and effective communication skills. The educational content for this intervention underwent a thorough review by five nursing experts to ensure its validity and relevance.

A month later, on completion of an intervention, data was collected again from the intervention group to evaluate the effectiveness of the intervention on the level of assessing surgical site infection by clinical predictors, length of stay, and patient satisfaction, whereas during the post-intervention gap, the participant nurses were ensured to practice the intervention properly, though the researcher continues visiting to clarify the queries regarding the intervention plan. Patient satisfaction level regarding nursing care quality was assessed by comparing it with the baseline data taken from the control group participants.

Data Analysis

The data coding and analysis for this study were conducted using the Statistical Package for Social Sciences (SPSS) software, version 23.

Ethical Considerations

The study was conducted with strict adherence to ethical principles to protect the rights, privacy, and well-being of all participants. The following measures were implemented to ensure ethical integrity:

- ✓ All procedures followed the rules and regulations set by the Research Ethical Committee (REC) of The University of Lahore. Ethical standards were maintained throughout the study duration.
- ✓ A formal permission letter was obtained from the REC of The University of Lahore before initiating the data collection process.
- ✓ Additional permission was secured from the Medical Director of a Teaching Hospital, Lahore to conduct research within the hospital setting.
- ✓ Before data collection, the study's aims and objectives were clearly explained to all participants. They were fully informed about the purpose, procedures, potential risks, and benefits involved in the study.
- ✓ Participation was entirely voluntary. Each participant provided written, informed consent before joining the study. Additionally, participants were given the freedom to withdraw from the study at any point without facing any consequences or penalties.
- ✓ To protect participants' identities, anonymity was ensured throughout the research process. Data were handled and recorded with unique identifiers instead of personal details.
- ✓ All collected information was stored securely and was accessible only to the research supervisor. The data were not shared with any unauthorized individuals.
- ✓ The findings were published with the sole purpose of contributing to healthcare improvement. The results were also shared with the hospital administration to help inform strategies for better patient care and outcomes.

Results

This chapter contains results of the study initiated from the general characteristics subscale of the patient satisfaction with nursing care quality questionnaire followed by a checklist of clinical predictors of surgical site infection, surgical wound

classification and length of stay among the study participants grouped as control and intervention.

Table 1

General Characteristics of Control and Intervention Groups Participants

Patients' Characteristics	Control Group	Intervention Group
Age		
Minimum	17	18
Maximum	75	65
Mean	37	31
	n (%)	n (%)
Gender		
Male	16 (64%)	17 (68%)
Female	9 (36%)	8 (32%)
Marital status		
Single	7 (28%)	10 (40%)
Married	18 (72%)	15 (60%)
Number of hospitalization in last 2 years		
Only once	9 (18%)	7 (14%)
Twice	6 (12%)	7 (14%)
3 times	4 (8%)	5 (10%)
4 times	0	0
Over 4 times	6 (12%)	6 (12%)
Pre-hospitalization health status		
Excellent	0	0
Good	3 (12%)	4 (16%)
Fair	4 (16%)	5 (20%)

Poor	7 (28%)	8 (32%)
Very Poor	10 (40%)	6 (24%)
Unsure	1 (4%)	2 (8%)
Method of hospital admission		
Admitted through the Emergency Department	3 (12%)	7 (28%)
Admitted through patient registration/to the unit directly	12 (48%)	13 (52%)
Admitted after day procedure or test	5 (20%)	3 (12%)
Transferred from another facility	3 (12%)	1 (4%)
Other	2 (8%)	1 (4%)
Accompanied with attendants during hospitalization		
By yourself	0	0
With 1 other person	5 (20%)	3 (12%)
With more than 1 other person	20 (80%)	22 (88%)

General characteristics of the laparotomy patients have been distributed into control and intervention group as mentioned in the (Table. 1) accommodating 25 patients in each group. Patients were divided according to gender in the control group as 64% male and 36% females whereas intervention group contains 68% males and 32 % female patients, signifying high proportion of male patients among both the groups. The average age of patients in the control group is 37 years on the other hand 31 years is estimated in the intervention group. In terms of marital status the control group has 28% unmarried patients and 72% married whereas the intervention group has 40% unmarried and 60% married patients. The hospitalization trend in past couple of years among both groups reported once or twice. About 40% of control group patients had very poor health and 28% had poor health prior admitted to hospital however the participants recruited in control group had 32% poor health and 24% very poor health. Mostly the patients admitted through the registration desk with 48% control group participants and 52% from the intervention group. Likewise 80% patients in control group accompanied with more than one attendant during hospital stay while intervention group patients' average found 88%. Generally, the data outlines key demographic and health-related characteristics that can be vital for understanding the patient populations in laparotomy cases.

According to the Center of Disease Control (CDC) wound classification among control and intervention group, a high rate of class-III (contaminated) found 48%,

class-IV (dirty) wound is at 28% whereas class-II (clean) wounds has been reported at minimal level of 24%. Contrary the intervention group the wound classification reported as class-II (clean) 60%, class-III (contaminated) that is 36% and class-IV (dirty) wound only 4%. Overall the wounds severity has been dropped between intervention groups while control group just has fewer clean wounds than intervention group. According to the statistical evaluation about 60% of patients in the intervention group stayed for less than seven days means they had a good length of stay whereas it's reduced up to 24% in the control group. While the majority of patients in both groups stayed for an average of 8-14 days, the intervention group had a little lower proportion (36%) than the control group (48%). However, just 4% of patients in the intervention group stayed for longer than 14 days, compared to 28% in the control group. These results show how effectively the method worked to shorten hospital stays.

Table 2

Comparison of Clinical Predictors of Surgical Site Infection among Control and Intervention Groups

Clinical predictors analysis	Levene's Test for Variances Equality		t-test for Means Equality						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	.227	.638	1.4	28	.173	.19467	.13909	-.09024	.47957
Equal variances not assumed			1.4	27.867	.173	.19467	.13909	-.09030	.47964

Independent Samples t-Test (p=0.05)

In Table. 2 the t-test results showed a t-value of 1.400 with 28 degrees of freedom. The two-tailed p-value was calculated to be 0.173, which exceeds the standard significance level of 0.05. This indicates that there is no statistically significant difference in the mean clinical predictor scores between the two groups, and any observed variation is likely due to random chance.

The mean difference revealed that the intervention group's average clinical predictor score was 0.1947 higher than that of the control group with standard error of the difference was 0.13909, providing an estimate of the variability surrounding the mean difference. Additionally, the 95% confidence interval for the mean difference ranged from -0.09024 to 0.47957. The average score of patient satisfaction with nursing care quality was higher in the intervention group, with a mean value of 3.80, compared to the control group, which had a mean value of 3.68 with standard deviation for the control group and intervention group was 0.577.

Table 3

Mean score of PSNCQ among Control and Intervention Groups

Patient satisfaction with nursing care quality analysis	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	.019	.890	-.748	48	.458	-.120	.160	-.443	.203
Equal variances not assumed			-.748	47.937	.458	-.120	.160	-.443	.203

Independent Samples t-Test (p=0.05)

The results of the t-test for patient satisfaction with nursing care quality, as presented in Table 3, indicate that there is no statistically significant difference in satisfaction scores between the control and intervention groups, with a p-value of 0.458. This suggests that the educational intervention did not lead to a significant increase in patient satisfaction among laparotomy patients. The mean difference between the two groups was calculated as -0.120, indicating a slight decrease in satisfaction in the intervention group; however, this difference is minimal and statistically insignificant.

Table 4

Relationship of Surgical site infection with length of stay and patient satisfaction in Control and Intervention Groups

		Control group length of stay	Intervention group length of stay	Control group mean satisfaction score	Intervention group mean satisfaction score
CDC Surgical Wound Classification in Control Group	Pearson Correlation	.721**	-.422*	.033	-.079
	Sig. (2-tailed)	.000	.036	.877	.709
CDC Surgical Wound Classification in Intervention group	Pearson Correlation	.118	.686**	.067	.272
	Sig. (2-tailed)	.573	.000	.751	.188
	N	25	25	25	25

** *Correlation is significant at the 0.01 level (2-tailed)*

* *Correlation is significant at the 0.05 level (2-tailed)*

Table 4 reveals a significant positive correlation amongst wound classification and LOS ($r = 0.721$, $p < 0.01$) of control group participants, indicating that more severe wound classifications are associated with longer hospital stays. Additionally, there is a significant negative correlation between wound classification and patient satisfaction scores ($r = -0.422$, $p < 0.05$), suggesting that as wound severity increases, patient satisfaction tends to decrease. Contrary, the intervention group demonstrates different patterns. The relationship between wound classification and length of stay is weak ($r = 0.118$, $p = 0.573$), suggesting that wound severity had little impact on the duration of hospitalization for these patients. However, there is a strong positive correlation between surgical wound classification and satisfaction scores ($r = 0.686$, $p < 0.01$), indicating that patients with more severe wounds reported higher satisfaction with their nursing care. This finding may suggest that the educational intervention improved nurses' ability to provide effective care for patients with more complex wound care needs, potentially increasing patients' perception of care quality despite the severity of their condition.

Discussion

The current study recruited 64% males in control group and 68% in the intervention group, undergoing exploratory laparotomies. This trend aligns with previous research, which also observed a higher proportion of men undergoing trauma-related laparotomies. The reason behind this male dominance may be that men are more

likely to experience traumatic injuries or surgical complications like intestinal obstructions or perforations [20]. However, another study finding suggests a more balanced gender distribution in non-trauma-related laparotomies, where gender disparities may be less pronounced [15]. This contrast highlights the importance of considering the underlying causes of laparotomy procedures when analyzing gender patterns.

Regarding age distribution, the control group had a mean age of 37 years, while intervention group had 31 years. These results are consistent with a study who found that middle-aged adults were the most frequently operated [14]. Interestingly, a study reported a slightly different demographic pattern, with females comprising 57.3% of cases, males 42.7%, and an overall mean age of 43.6 years [21]. These findings emphasize the need to account for both demographic and clinical factors when evaluating laparotomy patients, ensuring a more tailored approach to surgical care and management. Another cohort study regarding laparotomy surgeries recruited the patients having age from 16 to 83 years, with a median age of 59 years. Among these patients, 77.5% were male, while 22.5% were female [9]. In contrast, studies conducted in high-income areas shown somewhat older patient populations who require laparotomy surgery [22].

Current study encompassed 60% married patients the intervention group and 72% in control group which is consistent with research from throughout the world, which discovered that married status improved access to healthcare. However, the study insignificant group differences may signpost discrepancies in the demographic character of patients hospitalized during the intervention phase [23].

The majority of patients in both groups reported only one or two hospital admissions in the past two years, indicating a trend of few previous hospitalizations. A study in Ghana observed the same trends, where a large proportion of laparotomy patients were acute or first-time cases. Both study groups reported similar experiences in terms of hospital admission and support, often arriving through direct referrals or emergency admissions [24]. These findings align with global surgical care study, which emphasizes the critical role of family involvement in surgical decision-making and patient recovery [25].

This study highlights the clinical and demographic diversity of laparotomy patients, which should be carefully considered when designing nurse-led care plans. While these findings are consistent with research from both high- and low-income countries, Pakistan presents unique challenges due to its younger patient population and higher rate of acute cases. For instance, it has been noted that older patients typically require longer recovery periods, reinforcing the need for age-appropriate post-surgical care [25]. In contrast, the cohort study underscores the urgency of treating acute conditions quickly to prevent complications such as SSIs. Moreover the idea that family involvement significantly enhances recovery, particularly in resource-limited settings [16].

The framework of a nurse-led care plan had a substantial impact on managing SSIs, reducing clinical predictors of infection, and improving overall patient outcomes. Key indicators such as temperature, drainage, warmth, and edema showed significant improvement in the intervention group compared to the control group. Wound

drainage rates dropped from 40% to just 8%, while fever occurrence fell dramatically from 56% in the control group to 16% in the intervention group. The decline in SSI rates mirrors global research which demonstrated that nurse-led interventions lead to better patient outcomes [6]. The intervention group had a considerably shorter length of stay than the control group, with 32% of patients being discharged within 7 days. This means that nurse-led interventions escalate operational effectiveness while also meritoriously combating SSIs. Prompt infection identification and its management contribute to shorter length of hospital stays though good SSI prevention is associated to fewer hospitalizations [14]. On the other hand it has been found that patients underwent exploratory laparotomy surgeries had an average length of stay of 12.0 ± 20.4 days [24].

It's worth observing that though the intervention group's mean patient satisfaction score improved (from 3.68 in the control group to 3.80 in the intervention group), the variance was not statistically significant. This suggests that, while there were significant clinical advances, further study may be required to fully enhance satisfaction ratings in areas such as communication, the hospital atmosphere, and tailored therapy. Whereas another study observed that patients are satisfied on average level both public and private with percentages 54.2% and 57.1% [16].

According to the CDC surgical wound classification, the intervention group participants had a significant reduction in class-III (contaminated) and class-IV (unclean) wounds, which fell from 48% and 28% in the control group to 36% and 4%, respectively. This validates how systematic wound care techniques may be applied in real-world settings. These findings are consistent with universal best practices for wound care and infection prevention [22]. Furthermore this study found that the intervention group outperformed the control group in several key areas. The nurse-led care plan not only shortened hospital stays and reduced clinical predictors of SSIs, but it also slightly improved patient satisfaction with nursing care quality. These results align with previous studies showing that well-coordinated nursing interventions can significantly enhance patient outcomes [6]. One of the most notable improvements was in wound care. The intervention group saw a dramatic drop in class IV (dirty) wounds from 28% in the control group to just 4%, which further validates prior research that highlights the effectiveness of nurse-led wound management strategies [26]. Additionally, the lower mean clinical predictor score in the intervention group underscores the importance of early surveillance and detection in preventing SSIs, a finding consistent with global evidence advocating for proactive infection monitoring to improve surgical outcomes [27].

These findings add to the growing body of research on nurse-led surgical interventions and highlight the critical role of nursing expertise and autonomy in implementing evidence-based care. By empowering nurses to take a leading role in patient care, healthcare systems can enhance recovery rates, reduce complications, and improve overall surgical outcomes [27].

Conclusion

This study indicates how important nurse-led interventions are in optimizing surgical care outcomes. The study demonstrates that the clinical intervention was effective in reducing the frequency and severity of surgical site infections, shortening hospital stays, and modestly improving patient satisfaction. These findings highlight the

importance of evidence-based nursing interventions in improving patient outcomes. Future research should explore additional strategies to enhance patient satisfaction and further reduce postoperative complications.

This study recommends that policymakers prioritize the deployment of evidence-based nurse-led therapies. Essential various phases include developing standards for implementing nurse-led practices in surgical care, aiding education initiatives and pilot studies that examine the effects of nurse-led care plans, and creating incentives for healthcare institutions to implement these interventions while monitoring their outcomes.

Expanding the scope of research is critical for developing nurse-led care plans. This may be accomplished by conducting comprehensive research in a range of healthcare settings to validate findings and examine additional factors such as patient demographics and cost-effectiveness. Improving patient satisfaction should also be the foremost priority, which may be accomplished by identifying key characteristics and developing targeted therapies that bridge communication disparities and promote appropriate care. Furthermore, integrating technology is crucial; utilizing digital tools and telehealth platforms can support nurse-led care plans by enabling real-time monitoring and fostering improved patient engagement.

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