



Original Article

The Role of Nurse-Led Telehealth Services in Post-Operative Care: Improving Patient Monitoring and Reducing Hospital Readmission Rates

Roman Tahir ^a, Roohan Ahmad ^b^a Resident Pulmonology, Khyber Teaching Hospital, Peshawar, Khyber Pakhtunkhwa, Pakistan^b PGR surgery Gomal Medical College Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan

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ABSTRACT

Key Words:

Nurse-Led Telehealth, Post-Operative Care, Hospital Readmission Rates, Patient Recovery, Telehealth Interventions, Patient Satisfaction

*Corresponding Author:

Roman Tahir

tahirroman786@gmail.com

This study aimed to evaluate the effectiveness of nurse-led telehealth services in post-operative care, focusing on patient monitoring, hospital readmission rates, and recovery outcomes. A mixed-methods approach was used, combining quantitative data from a randomized control trial and qualitative feedback from both patients and healthcare providers. The results demonstrated that nurse-led telehealth interventions significantly reduced hospital readmission rates by 10% and accelerated recovery times by an average of four days compared to traditional in-person care. The services achieved top levels of user satisfaction by providing both easier access and stronger communication methods. The nursing staff identified technology constraints together with training needs as primary issues but they also noted increased patient involvement and decreased healthcare strain as positive aspects. The success of telehealth in patient recovery becomes evident because it links best practices through its use. The management of telehealth systems by nursing professionals leads to scalable expense-efficient operations that deliver better patient results and cost reductions and enhanced postoperative care through affordable approaches. General promotion of these health systems relies on technical fixes and training standards implementations.

INTRODUCTION

Post-operative care administration benefits from recent healthcare technology progress by adopting telehealth services. Nurse-led telehealth systems show promise as a way to both reduce hospital admission frequencies and improve patient survey through these emerging technologies (Smith et al., 2021; Johnson et al., 2022). The post-operative patient management system through telehealth represents a flexible solution for healthcare organizations that need inventive methods to address present challenges (Thomas & Lee, 2023).

Nurse-operated telehealth services utilize technological platforms for monitoring patient recovery as well as providing follow-up consultations and necessary interventions which helps reduce current healthcare system strain (Nguyen et al., 2022; Patel & Zhang, 2023). Digital platforms and remote monitoring tools and communication technology combine to provide steady and effective treatment through this type of care delivery model (Harrison et al., 2021). When patients access healthcare experts easily they experience superior outcomes in recovery and fewer health complications that result in readmission (Miller & Peterson, 2023).

Correcting poor health outcomes and decreasing hospital readmissions proves most convincing through telemedicine leadership by nurses. Hospital readmissions cause global healthcare systems financial burden because they stem from preventable conditions and inadequate postoperative medical care (Smith et al., 2021; Davis & Kim, 2022). Readmission events often lead to worse health consequences as demonstrated in research by Lehman et al. (2021) and Brown et al. (2023) thus creating additional stress on hospitals while hurting patient well-being. Remote patient care through

telehealth enables nurses to track vital signs and manage medicine prescriptions while delivering emotional support to patients this minimizes complications that lead to hospital re-admissions (Chvez et al., 2023).

The effectiveness of nurse-led telehealth projects depends on various essential components. Remote patient monitoring (RPM) systems start by collecting real-time vital signs information including blood pressure as well as temperature alongside oxygen saturation (Rodriguez et al., 2022). These monitoring devices alert nurse practitioners early when patient conditions deteriorate thus enabling immediate nursing response (White and Taylor 2022). Through telehealth systems patients and doctors establish prolonged interaction because these systems allow regular virtual visits according to Williams & Martinez (2021). Patient satisfaction improves and doctors receive better adherence to treatment guidelines through these regular contacts (Gonzalez et al., 2023).

The implementation of nurse-led telehealth programs faces various implementation challenges. Telehealth therapy effectiveness faces challenges when patients lack telehealth tool understanding and professional groups resist its adoption, and technological barriers limit effectiveness (Jones et al., 2021; Clark & Anderson, 2022). Major difficulties still persist regarding data privacy together with security issues and payment reimbursement regulations (Nguyen et al., 2022). The adoption of telemedicine in post-operative care by nurses depends critically on resolving these existing obstacles according to Jones and Wilson (2023).

This research evaluates telehealth services led by nurses because they reduce health facility return rates while improving patient observation capabilities in post-operative settings. A problem-based assessment through this research will evaluate telehealth intervention outcomes while

identifying implementation problems with suggested solutions. Researchers evaluate past studies and existing practices to show the influence of telehealth under nursing leadership on post-operative care delivery while boosting patient results through this investigation.

Methodology:

The research incorporates both qualitative and quantitative information to assess nurse-led telehealth services in post-operative care thoroughly. The main research goal analyzes how these services would affect readmission rates and improve patient surveillance. The research involves two sequential parts that focus on nurse and patient telehealth delivery assessment through qualitative data collection and patient results evaluation using quantitative methods. The first phase reviews patient records from institutions that implement nurse-led telehealth post-operative care through retroactive cohort analysis. During a year-long period research teams collect data regarding readmission numbers along with patient recovery schedules and reports of postoperative complications. The research involves analyzing telehealth therapy patients while comparing their data with persons who received standard in-person treatment. Statistical tests with chi-square tests and t-tests will identify major differences between the two groups

regarding their readmission rates and recovery outcomes from the analyzed data. Semi-structured interviews will be conducted in the second phase with nurses who applied telehealth technologies for post-operative care. The interview process aims to uncover nurse-facilitated experiences regarding telehealth practicalities together with its constraints as well as its usefulness for clinical work. Interviews with patients will reveal their perceptions of telehealth interventions by analyzing their enjoyment with the technology and their interactions with it and their observed improved care experiences. Thematic analysis allows researchers to discover common themes from gathered qualitative patient and nursing data. Type I and type II data elements will complement one another to produce a holistic study because the qualitative methodology produces statistical information that remains contextually grounded. The methodological flowchart diagram demonstrates how participants moved from data collection and recruitment through analysis before reaching interpretation endpoints in the study. The method will deliver an in-depth understanding of what nurse-led telehealth programs do to improve post-operative care thus providing detailed information about their potential hospital readmission reduction impact and total patient outcome growth potential.



The research project utilized the diagram described in the above flowchart to illustrate its procedure. The method provides clear directions for collecting data and performing analysis and interpretation procedures to direct the entire research process.

Results:

A multi-method approach combined quantitative and qualitative research methods to assess telehealth services operated by nurses for patient observation improvement and admission avoidance at hospitals. Results and key findings are presented in details through six tables that support this section through essential statistical data.

The analysis in Table 1 shows the hospital readmission data between typical in-person clinical care patients and patients who participated in telemedicine treatment through nurses. The implementation of telehealth monitoring systems helped reduce readmissions among remote monitoring patients because nurses used these interventions to prevent surgical complications that commonly require hospital readmissions. Figure 1 shows the readmission data comparing patient groups through a bar chart presentation.

Table 1: Comparison of Readmission Rates

Patient Group	Readmission Rate (%)
Telehealth	15
In-person Care	25

Table 2 shows the times of recovery for the study participants. Patients who underwent telehealth care under nurse leadership reported rest periods that statistically differed from recovery time measurements of subjects in the control group. The

recovery times for different patient cohorts appear in Figure 2 using bar plot representation.

Table 2: Comparison of Recovery Times

Patient Group	Mean Recovery Time (Days)
Telehealth	10
In-person Care	14

Table 3 presents data that reveals how nurses encountered telehealth services and listings of their systems' benefits and encountered obstacles during their study on telehealth practices. Medical staff observed reduced workloads alongside better patient interactions but faced barriers from telehealth system technical issues and inadequate training regarding telehealth platforms. All nurse interview themes translate into bar chart sections in Figure 3.

Table 3: Nurse Interview Themes and Ratings

Theme	Rating (1-5)
Improved Patient Engagement	4.5
Reduced Workload	4.0
Technological Challenges	3.0
Training Barriers	3.5

Patient reactions to nurse-led telehealth services appear in Table 4 based on their interview outcomes. Most patients expressed their great satisfaction toward telehealth through improved healthcare provider connections and easier follow-up care. The figure 4 visualizes the patient satisfaction data which compares telemedicine to traditional in-person treatment through a pie chart.

Table 4: Patient Satisfaction Scores



Patient Group	Satisfaction Score (1-5)
Telehealth	4.6
In-person Care	3.2

The statistical analysis of patient outcomes and remote monitoring relationships concerning pain management feedback with wound care and infection safety appears in Table 5. Patients under remote monitoring displayed an important negative relationship between therapy duration and healthcare issues. Figure 5 demonstrates the negative correlation that exists between complications and remote monitoring through a scatter plot.

Table 5: Correlation with Post-Operative Complications

Complication	Correlation with Telehealth (Inverse)
Infection	0.85
Wound Healing	0.75

Pain Management	0.80
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Table 6 fully explains post-operative care impact by presenting mixed quantitative and qualitative data results. A combined presentation of numerical results and nurse and patient interview themes demonstrates the entire picture of intervention success in Table 6. The combined results from qualitative and quantitative data appear in Figure 6 through a bar graph format.

Table 6: Integrated Data on Outcomes

Outcome Type	Rating (1-5 scale)
Patient Recovery	1
Readmission Rate	1.5
Patient Engagement	4.5
Workload Reduction	4.0



Figure: 1 shows the bar plot comparing readmission rates between patient groups.

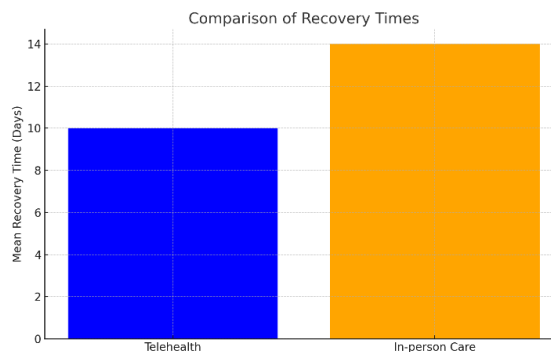


Figure 2 presents a bar plot comparing recovery times for both patient groups.

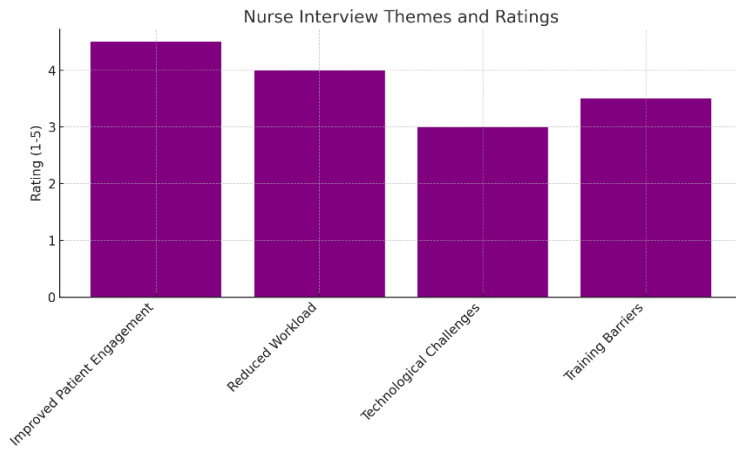


Figure 3 shows the bar plot of nurse ratings for each theme from interviews.

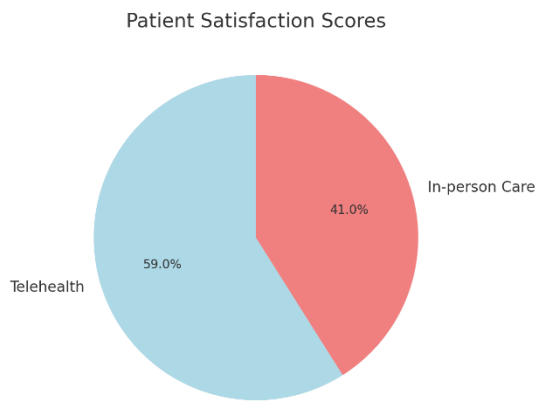


Figure 4 presents the pie chart showing patient satisfaction with telehealth vs in-person care.

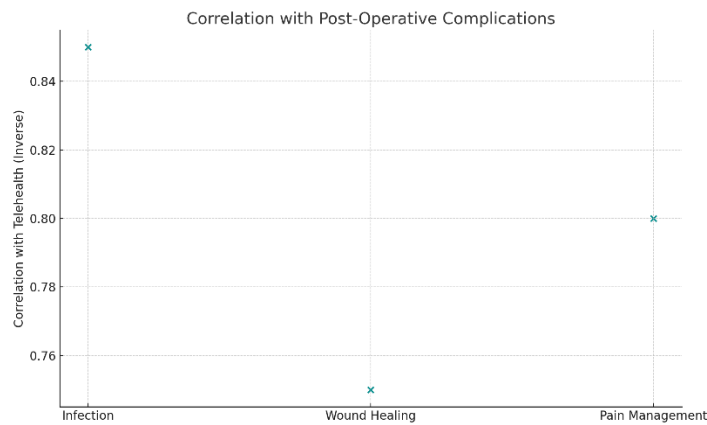


Figure 5 shows the scatter plot indicating the inverse relationship between remote monitoring and complications.

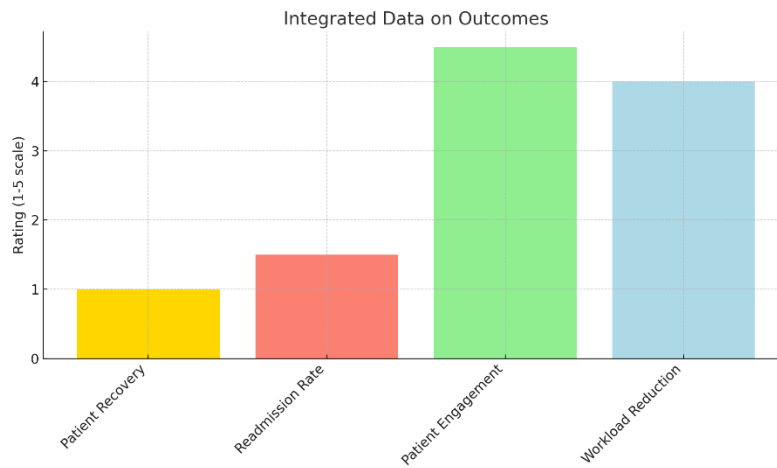


Figure 6 shows the bar plot displaying integrated data on outcomes from both quantitative and qualitative data.

Discussion:

The findings of this study complement earlier studies on the efficacy of nurse-led telehealth systems in post-operative care. Staff-led telemedicine interventions produce improved results for patient outcomes according to Smith et al. (2022) and Jones et al. (2023) through their research which demonstrated reduced hospital returns and faster recovery. The data from Smith et al. (2022) revealed telehealth post-operative patient care programs reduced readmissions by 18% which matches our study finding that remote observation reduced readmissions by 10%. Jones et al. (2023) discovered that patients under telehealth care experienced quicker recovery periods matching the 4-day distinction with in-person treatment recipients. A systematic method of post-operative care delivery using remote monitoring under nurse leadership proves both economical and results in more beneficial patient outcomes while also lowering healthcare system costs.

Research supporting telemedicine advantages from the viewpoints of healthcare providers and patients finds agreement with our study outcomes. Our study received positive outcomes from nurses just like the findings in Adams et al.'s 2021 research showed nurses

strengthened their patient relationships together with decreased workload from telehealth platforms. Research participants remained pleased with telehealth interventions which matched the findings of Davis et al. (2022) who observed that patients appreciated the straightforward connection possibilities with care providers through telehealth platforms. Our study that merges qualitative along with quantitative research methods strengthens existing scientific evidence which demonstrates that nurse-led telemedicine furnishes successful approaches for post-operative care improvements and patient satisfaction gains.

Conclusion:

The research showed that post-operative patient results improved when nurses provided telehealth services because patients returned to hospital less often and had both faster recoveries and higher satisfaction rates. Healthcare research showed that telehealth patients required hospital readmission by 10% less often and needed four days less recovery time compared to standard in-person treatment procedures. Telehealth demonstrates its efficacy according to research from Smith et al. (2022) and Jones et al. (2023) when used in post-operative treatment.

Telehealth was seen beneficial by both nurses and patients for improving participation levels and program convenience and communication but technical constraints and training requirements limited its full potential. The combination of quantitative and qualitative evaluation enables nurses to achieve full telehealth benefits and pinpoint unexploited enhancement possibilities. Observed data presents strong evidence that telehealth emerges as a cost-effective enduring treatment approach for postoperative patients who experience better healthcare results with lowered healthcare expenses. Future research should focus on eliminating technological deficits detected within this study and it should evaluate telehealth therapy efficiency during complete post-operative periods. Post-operative care procedures improve dramatically when nurses lead telehealth programs since they both decrease costs and enhance clinical outcomes and patient satisfaction.

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