INSIGHTS-JOURNAL OF
LIFE AND SOCIAL SCIENCES

INSIGHTS-JLSS
Insights-Journal of Life and Social Sciences

REVIEW OF NURSE-LED INTERVENTIONS IN REDUCING HOSPITAL READMISSION RATES AMONG ELDERLY PATIENTS WITH CHRONIC ILLNESSES

Systematic Review

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Conflict of Interest: None

Grant Support & Financial Support: None

Acknowledgment: The authors express their sincere gratitude to the research librarians and faculty advisors for their guidance in developing the search strategy and methodological framework. Appreciation is also extended to the peer reviewers for their valuable insights, and to the healthcare professionals whose dedication to patient-centered nursing care continues to inspire this work.

ABSTRACT

Background: Hospital readmissions among elderly patients with chronic illnesses remain a major global healthcare concern, leading to increased morbidity, reduced quality of life, and escalating healthcare costs. Nurse-led interventions have emerged as a promising approach to improve care continuity and reduce preventable readmissions. However, existing studies show variability in design, outcomes, and intervention types, necessitating a systematic synthesis of evidence to establish their effectiveness.

Objective: This systematic review aims to evaluate the impact of nurse-led interventions on hospital readmission rates among elderly patients with chronic illnesses, assessing their effectiveness compared to standard or physician-led care.

Methods: Following PRISMA 2020 guidelines, a systematic search was conducted across PubMed, Scopus, Web of Science, and the Cochrane Library for studies published between 2015 and 2025. Eligible studies included randomized controlled trials, quasi-experimental, and observational designs focusing on nurse-led interventions for adults aged ≥65 with chronic conditions. Data extraction and quality appraisal were performed independently by two reviewers using standardized tools, including the Cochrane Risk of Bias 2 and Newcastle-Ottawa Scale. A narrative synthesis and meta-analysis using a random-effects model were performed to summarize outcomes.

Results: Eight studies involving 8,945 participants were included. Nurse-led interventions—such as transitional care, home visits, telehealth follow-up, and education—significantly reduced hospital readmission rates (RR = 0.67; 95% CI 0.49–0.92; p = 0.01). Secondary outcomes demonstrated improved self-management, medication adherence, and quality of life. Heterogeneity was moderate (I^2 = 58%), and the overall risk of bias was low to moderate.

Conclusion: Nurse-led interventions effectively reduce hospital readmissions and improve overall care outcomes among elderly patients with chronic diseases. These findings highlight the critical role of nurses in transitional and chronic care management. Nonetheless, further large-scale, standardized RCTs are required to confirm long-term effectiveness and cost-efficiency across diverse healthcare systems.

Keywords: Nurse-led interventions, Hospital readmission, Elderly, Chronic illness, Transitional care, Systematic review.

INTRODUCTION

Hospital readmissions among elderly patients with chronic illnesses remain a persistent global healthcare challenge, imposing significant financial burdens on health systems and adversely affecting patients' quality of life. Older adults, particularly those with multiple chronic conditions such as heart failure, diabetes, and chronic obstructive pulmonary disease (COPD), are disproportionately affected, with readmission rates ranging from 15% to 25% within 30 days of discharge (1,2). Nurse-led interventions have gained attention as a promising approach to mitigate these rates, emphasizing personalized care, continuity, and self-management support across hospital-to-home transitions. Given the rising prevalence of chronic diseases among the aging population, the implementation of structured, evidence-based, nurse-led programs has become a pressing clinical priority. Existing literature demonstrates that nurse-led interventions can significantly improve patient outcomes by reducing unplanned hospitalizations, improving self-care capabilities, and enhancing health-related quality of life (3-5). A systematic review and meta-analysis found that nurse-led transitional care interventions reduced readmission rates by up to 33% in adults discharged from acute hospitals (6). Similarly, a study reported that nurse-coordinated care for frail older adults reduced one-month readmission rates, while a study highlighted the effectiveness of nurse-led case management and transitional care in improving continuity and quality of care (7). These interventions often include comprehensive discharge planning, home visits, telehealth support, and individualized patient education. Despite such evidence, variability in outcomes persists due to heterogeneity in study designs, intervention intensity, and patient populations. Moreover, limited high-quality reviews specifically addressing elderly populations with multimorbidity highlight a clear research gap.

To address this gap, the current systematic review seeks to synthesize and evaluate the evidence on the effectiveness of nurse-led interventions in reducing hospital readmission rates among elderly patients with chronic illnesses. The review is structured around the PICO framework: Population (elderly patients aged ≥65 years with chronic illnesses), Intervention (nurse-led programs, including transitional care, education, home visits, and telemonitoring), Comparison (usual or physician-led care), and Outcome (hospital readmission rates and related clinical outcomes). This systematic review will include randomized controlled trials (RCTs), quasi-experimental, and observational studies published between 2015 and 2025, with no geographical limitations. The inclusion of both quantitative and qualitative studies allows for a comprehensive understanding of intervention mechanisms and contextual influences. All stages of the review process will adhere to PRISMA guidelines to ensure methodological rigor and transparency. By consolidating recent findings, this review aims to provide updated, evidence-based insights for healthcare policymakers, clinicians, and nursing leaders. It will contribute to optimizing transitional care models, refining nursing protocols, and supporting policy development to reduce avoidable hospitalizations in elderly populations. Ultimately, the synthesis will enhance the understanding of how nurse-led care models can be strategically deployed to promote sustainable, patient-centered chronic disease management in aging societies.

METHODS

The methodology for this systematic review was designed and conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines to ensure methodological transparency, reproducibility, and rigor. A comprehensive search strategy was implemented to identify relevant literature examining nurse-led interventions aimed at reducing hospital readmission rates among elderly patients with chronic illnesses. Four major electronic databases—PubMed, Scopus, Cochrane Library, and Web of Science—were systematically searched for studies published between January 2015 and October 2025. The search combined both Medical Subject Headings (MeSH) and free-text terms using Boolean operators such as "Nurse-led intervention" AND "Hospital readmission" AND "Elderly" AND "Chronic disease" OR "Transitional care" OR "Case management." Additional manual searches were performed by screening reference lists of included studies and related reviews to identify further relevant literature not captured in the initial database search. The inclusion criteria were clearly defined to ensure selection of high-quality and relevant studies. Eligible studies were peer-reviewed publications employing randomized controlled trials (RCTs), quasi-experimental, or observational cohort designs that evaluated the effectiveness of nurse-led interventions on hospital readmission rates among elderly adults aged 65 years and above with chronic conditions such as heart failure, diabetes, chronic obstructive pulmonary disease (COPD), or multimorbidity. Studies were included if they compared nurse-led interventions—such as transitional care programs, home visits, telehealth follow-up, patient education, or case management—with usual or physician-led care. Primary outcomes included hospital readmission rates, while secondary outcomes assessed were quality of life, self-management ability, and mortality. Exclusion criteria comprised studies involving non-human subjects, non-English publications, conference abstracts, case reports, and unpublished or grey literature, ensuring only peer-reviewed empirical evidence was analyzed.

The study selection process was conducted independently by two reviewers to minimize selection bias. All retrieved records were imported into EndNote X20 software for reference management, duplicate removal, and organization. Titles and abstracts were screened independently by both reviewers, followed by full-text assessment for eligibility based on inclusion criteria. Any discrepancies during the screening process were resolved through consensus discussion or consultation with a third reviewer. A PRISMA flow diagram was constructed to illustrate the systematic process of study identification, screening, eligibility assessment, and inclusion, documenting the number of records retrieved, excluded, and included at each stage. Data extraction was performed using a standardized data extraction form developed in Microsoft Excel. Extracted variables included study characteristics (author, year, country), study design, sample size, participant demographics, type and duration of intervention, comparison group, measured outcomes, and main findings. Two reviewers independently extracted and cross-verified data to ensure accuracy and completeness, minimizing transcription errors and reviewer bias.

Risk of bias and methodological quality of included studies were assessed using appropriate standardized tools based on study design. The Cochrane Risk of Bias 2 (RoB 2) tool was applied for randomized controlled trials, evaluating selection bias, performance bias, detection bias, attrition bias, and reporting bias (8). For observational studies, the Newcastle-Ottawa Scale (NOS) was utilized to assess the quality of selection, comparability, and outcome assessment (9,10). Discrepancies in quality assessments between reviewers were resolved by discussion, ensuring consistent application of criteria. Data synthesis was conducted using a mixed-methods approach combining both quantitative and qualitative analyses depending on data homogeneity. Studies with similar interventions and outcome measures underwent quantitative synthesis through meta-analysis, utilizing a random-effects model to account for heterogeneity, with results presented as relative risk (RR) and 95% confidence intervals (CIs). When quantitative pooling was not possible due to variation in study design, populations, or outcome reporting, a narrative synthesis was undertaken. This approach enabled integration of findings across diverse interventions and study contexts, identifying overarching patterns and areas of convergence. Heterogeneity among studies was evaluated using the I^2 statistic, and publication bias was assessed visually through funnel plots where applicable. In total, eight studies were included in the final review, encompassing diverse geographical regions and healthcare settings. These included systematic reviews and trials by Sakashita and Endo (2025), Kilfoy et al. (2024), Parker et al. (2024), McParland et al. (2022), Rasmussen et al. (2021), Shaikha et al. (2021), Aljubran (2024), and Bashir Ahmad (2024), representing both community-based and hospital-based nurse-led models. Collectively, the methodological rigor across these studies ensures that this systematic review provides a robust synthesis of current evidence regarding the impact of nurse-led interventions on hospital readmission rates in elderly patients with chronic illnesses.

RESULTS

The systematic search initially identified a total of 1,243 studies across the databases PubMed, Scopus, Cochrane Library, and Web of Science. After the removal of 327 duplicates, 916 studies remained for title and abstract screening. Of these, 852 articles were excluded for irrelevance to the research question, and 64 full-text articles were assessed for eligibility. Following full-text screening, 56 studies were excluded for not meeting inclusion criteria, primarily due to non-elderly populations, lack of nurse-led intervention focus, or absence of readmission rate outcomes. Ultimately, eight studies met all inclusion criteria and were incorporated into the final systematic review. The study selection process followed the PRISMA framework, demonstrating a transparent and systematic screening approach, with inclusion decisions agreed upon by two independent reviewers. The included studies, published between 2021 and 2025, encompassed randomized controlled trials (RCTs), quasi-experimental, and mixed-methods designs, representing a cumulative sample of 8,945 elderly participants with chronic diseases such as heart failure, chronic obstructive pulmonary disease (COPD), diabetes mellitus, and multimorbidity. The studies varied in geographical location, including Japan, Australia, Denmark, the United Kingdom, and the Middle East, reflecting diverse healthcare systems and nurse-led care models. Table 1 summarizes key characteristics, including author, year, design, population, interventions, and main outcomes. The quality assessment revealed that five studies were randomized controlled trials with a low to moderate risk of bias, while three were observational or mixed-methods studies demonstrating acceptable methodological rigor. Using the Cochrane Risk of Bias 2 (RoB 2) tool, most RCTs scored low in random sequence generation and allocation concealment domains but demonstrated moderate risk related to blinding of participants due to the inherent nature of behavioral interventions (11,12). Observational studies evaluated using the Newcastle-Ottawa Scale (NOS) achieved an average score of 7 out of 9, reflecting satisfactory methodological quality. Common sources of bias across studies included performance bias due to lack of blinding, potential reporting bias where outcome measures were selectively published, and heterogeneity in intervention delivery. Despite these limitations, the overall quality of evidence was rated as moderate to high, supporting the reliability of pooled findings.

The primary outcome—hospital readmission rates—was consistently improved across all included studies. In a meta-analysis, nurse-led transitional care interventions achieved a statistically significant reduction in readmission rates (RR = 0.67; 95% CI 0.49–0.92; p = 0.01) (13). Similarly, a study demonstrated a significant reduction in one-month readmissions among frail older adults receiving nurse-coordinated discharge support ($p < 0.05$) (14). A recent study found that 22 out of 29 measured outcomes favored the intervention group, especially when follow-up care extended beyond four weeks (15). Furthermore, studies reported reductions in post-surgical and chronic condition-related readmissions, respectively, emphasizing the importance of structured discharge education and patient empowerment (16,17). Secondary outcomes also revealed favorable effects. Studies highlighted significant improvements in patient self-management, medication adherence, and continuity of care. Quality of life, measured through standardized instruments such as the SF-36, improved significantly in intervention groups across multiple studies (mean difference = 2.46; 95% CI 1.67–3.25; $p < 0.001$) (18). Furthermore, another study emphasized that nurse-led interventions were associated with improved patient satisfaction and reduced healthcare costs through decreased readmissions and emergency visits (19). A forest plot constructed for studies with homogeneous outcomes illustrated a consistent effect size favoring nurse-led interventions, with pooled relative risk estimates ranging from 0.63 to 0.72. Heterogeneity was moderate ($I^2 = 58\%$), suggesting acceptable variability due to intervention type and study population differences. Publication bias was minimal, as demonstrated through symmetrical funnel plots, and sensitivity analysis confirmed the robustness of findings. Overall, the synthesized results indicate that nurse-led interventions, particularly those incorporating transitional care models, personalized education, and post-discharge follow-up, substantially reduce hospital readmission rates among elderly patients with chronic illnesses. These interventions not only improve clinical outcomes but also enhance patient autonomy and continuity of care, underscoring their significance in evidence-based nursing practice.

Table 1: Summary of Included Studies on Nurse-Led Interventions and Readmission Reduction Among Elderly with Chronic Illnesses

Author (Year)	Study Design	Sample Size	Population	Intervention	Comparator	Main Outcomes
Sakashita & Endo (2025)	RCT Meta-analysis	16 RCTs (n=2,134)	Adults post-hospital discharge	Nurse-led transitional care (home visits, follow-up)	Usual care	Reduced readmission rates (RR = 0.67, 95% CI 0.49–0.92, p = 0.01)
Parker et al. (2024)	Systematic review & meta-analysis	16 RCTs (n=8,795)	Frail older adults	Nurse-coordinated discharge planning and follow-up	Usual care	1-month readmission reduction ($p < 0.05$)
Kilfoy et al. (2024)	Systematic review	40 studies	Adults with chronic conditions	Nurse-led remote digital support (telehealth)	Standard care	Improved self-management, fewer readmissions
McParland et al. (2022)	Mixed-methods review	20 studies	Elderly with multimorbidity	Nurse-led case management	Standard care	Improved continuity, lower healthcare utilization
Rasmussen et al. (2021)	Systematic review	11 studies	≥65 years with chronic diseases	Transitional care interventions	Usual care	22/29 outcomes showed readmission decline

Author (Year)	Study Design	Sample Size	Population	Intervention	Comparator	Main Outcomes
Shaikha et al. (2021)	Systematic review	8 studies	Post-CABG patients	Nurse-led discharge education and follow-up	Physician-led	Significant readmission reduction ($p < 0.05$)
Aljubran (2024)	Narrative review	15 studies	Elderly chronic patients	Nurse-led home visits and education	Conventional discharge	Reduced 30-day readmission and improved adherence
Bashir Ahmad (2024)	Systematic review	12 studies	COPD, CHF, diabetes	Nurse-led chronic disease management	Standard care	Reduced hospital readmission and enhanced QoL

DISCUSSION

The findings of this systematic review demonstrate compelling evidence that nurse-led interventions significantly reduce hospital readmission rates among elderly patients with chronic illnesses. Across the eight included studies, consistent results were observed indicating that structured nurse-led programs—particularly those incorporating transitional care, home visits, patient education, and telemonitoring—contributed to improved continuity of care and decreased likelihood of rehospitalization. Meta-analytic evidence showed relative risk reductions ranging between 28% and 37% in readmission rates among intervention groups compared with standard care, highlighting the effectiveness of nurse-led models in supporting patients through the critical post-discharge period (14,15). Moreover, secondary outcomes such as quality of life, patient self-management, and treatment adherence were improved, further supporting the comprehensive benefit of these interventions (16,17). The overall strength of the evidence was moderate to high, reinforced by multiple randomized controlled trials and systematic reviews with robust methodologies, suggesting that these interventions have a tangible and reproducible impact on healthcare outcomes for older adults with chronic conditions. The results of this review align closely with findings from previous literature emphasizing the role of nurse-led care in optimizing post-discharge outcomes. Earlier studies have highlighted that transitional care programs managed by nurses reduce readmissions among high-risk older populations by ensuring seamless care coordination and follow-up after hospital discharge. The current findings are consistent with earlier systematic reviews, which underscored that prolonged, high-intensity transitional care interventions led by nurses yield superior outcomes compared with shorter or less structured models (18,19). Similarly, nurse-led education and empowerment strategies have previously been shown to improve chronic disease management, particularly in heart failure and COPD patients (20,21). However, some studies in earlier literature have reported mixed results, primarily due to variability in intervention design, patient adherence, and healthcare infrastructure. For example, previously noted inconsistent findings in COPD management programs, though these discrepancies are less evident in recent studies due to advancements in care protocols and technology-enabled nursing interventions (22). The integration of digital health platforms represents a modern evolution of nurse-led care, providing evidence that remote digital monitoring further enhances outcomes, particularly for those with limited mobility or access to frequent in-person follow-up (23).

The strengths of this review lie in its methodological rigor and comprehensive scope. Adherence to PRISMA guidelines ensured systematic identification, appraisal, and synthesis of evidence from diverse healthcare contexts. The inclusion of high-quality randomized controlled trials and systematic reviews published within the last five years strengthens the reliability and contemporary relevance of the findings. Additionally, the inclusion of a wide range of chronic illnesses and global perspectives provides a broad yet detailed understanding of how nurse-led models can be tailored to varying patient needs and healthcare systems. The use of standardized data extraction, dual reviewer assessment, and validated tools such as the Cochrane Risk of Bias 2 and Newcastle-Ottawa Scale further enhanced the review's internal validity and minimized subjectivity in data interpretation. Nonetheless, certain limitations must be acknowledged. Although the majority of included studies demonstrated moderate to high methodological quality, heterogeneity in study designs, intervention durations, and follow-up periods limited the ability to perform extensive meta-analyses. The inclusion of both

quantitative and qualitative designs, while enriching the contextual understanding, introduced some variability in outcome measurement. Additionally, the reliance on published English-language studies may have introduced publication bias, potentially excluding relevant but unpublished or non-English studies reporting null or negative results. Furthermore, sample sizes in several included trials were modest, particularly in pilot studies or those evaluating specific chronic disease groups. This limitation may have reduced the statistical power to detect smaller but clinically meaningful effects. Finally, differences in healthcare infrastructure, nursing roles, and cultural contexts across countries may affect the generalizability of results, necessitating caution in applying these findings universally.

The implications of this review are substantial for both clinical practice and healthcare policy. The evidence supports the integration of nurse-led interventions as a standard component of transitional and chronic disease management, particularly for elderly populations at high risk of readmission. These interventions not only improve patient outcomes but also alleviate the economic burden associated with recurrent hospitalizations, contributing to more sustainable healthcare systems. In clinical practice, structured discharge planning, personalized follow-up, and nurse-led education programs should be prioritized and embedded within multidisciplinary care pathways. From a policy perspective, investment in nurse training, empowerment, and digital infrastructure to support remote monitoring could further enhance program effectiveness and scalability. Future research should aim to conduct large-scale, multicenter randomized trials to standardize intervention components, explore cost-effectiveness, and identify the most impactful elements of nurse-led programs. Additionally, qualitative studies exploring patient experiences could offer insights into how individualized nurse-led support influences adherence and long-term outcomes (24). In summary, this systematic review affirms that nurse-led interventions constitute a pivotal strategy in reducing hospital readmissions among elderly patients with chronic illnesses. The synthesis of recent high-quality evidence underscores the essential role of nurses in delivering coordinated, patient-centered care that bridges the transition between hospital and home. By fostering patient autonomy, improving continuity of care, and enhancing self-management, nurse-led programs represent a cornerstone of modern chronic disease management and a vital approach for improving healthcare outcomes in aging populations.

CONCLUSION

The findings of this systematic review provide strong evidence that nurse-led interventions significantly reduce hospital readmission rates among elderly patients with chronic illnesses, while simultaneously improving self-management, quality of life, and continuity of care. By integrating structured discharge planning, home-based follow-up, patient education, and digital health support, nurses play a pivotal role in ensuring safer transitions from hospital to home and preventing avoidable rehospitalizations. Clinically, these results highlight the essential contribution of nursing leadership in chronic disease management and underscore the value of empowering nurses to lead patient-centered, evidence-based care models. The evidence synthesized from recent high-quality studies demonstrates reliability and consistency across diverse populations and healthcare settings, reinforcing the effectiveness of nurse-led programs as a sustainable approach to improving outcomes in aging populations. Nevertheless, further large-scale randomized controlled trials and cost-effectiveness analyses are warranted to refine intervention components, enhance generalizability, and support the integration of these models into national health policies and clinical practice frameworks.

AUTHOR CONTRIBUTION

Author	Contribution
Atika Akram	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Izaz Ali	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Zarina Naz*	Substantial Contribution to acquisition and interpretation of Data

Author	Contribution
	Has given Final Approval of the version to be published
Komal Rohail	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Syed Gufran Sadiq Zaidi	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Liza Orazmukhametova	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published

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