



Nurse-led intervention to improve quality of life and reduce rehospitalization in heart failure patients: A scoping review

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ABSTRACT

Background: Heart failure (HF) remains a major global health problem, characterized by high morbidity and mortality rates. HF imposes a substantial burden on healthcare systems due to high rates of hospitalizations and the need for intensive medical care. Nurse-led interventions have been increasingly recognized for their potential to improve patient outcomes across various healthcare settings

Purpose: This article aims to evaluate the effectiveness of a nurse-led intervention to improve the quality of life and reduce readmission rates in patients with heart failure.

Methods: This study used the PRISMA-ScR (Preferred Reporting Elements for Systematic Reviews and Meta-Analyses) framework. Searches for primary studies in any language were conducted in electronic databases such as PubMed, ScienceDirect, and Taylor & Francis. Articles were assessed using the Cochrane Risk of Bias Scale (ROB 2.0).

Results: Out of 476 articles retrieved from the initial database screening, only 5 articles successfully met the final selection criteria. Five articles were included in this scoping review. Nurses provide tailored education that promotes medication adherence, lifestyle modification, and symptom monitoring, which together enhance self-care behavior and patient empowerment. Nurse-led interventions appear most effective at enhancing QoL, while their impact on rehospitalization depends on the intervention's timing, duration, and intensity. Nurse-led interventions should be integrated into routine HF management, particularly during transitional care following hospital discharge, when patients are most vulnerable to readmission

Conclusion: Nurse-led interventions improve QoL and show potential to reduce rehospitalization among HF patients.

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1. Background

Heart failure (HF) remains a major public health problem worldwide, characterized by high morbidity and mortality rates [1]. Heart failure affects approximately 64.3 million people worldwide and is a leading cause of hospitalization and death [2]. HF imposes a substantial burden on healthcare systems due to high rates of hospitalizations and the need for intensive medical care [3]. Hospitalization of heart failure patients is associated with poor health-related quality of life,

frequent readmissions, high mortality, and high costs. Approximately 50% of heart failure patients are readmitted to the hospital within 6 months of their initial hospitalization. The rate of rehospitalizations within one year can be as high as 59% [4]. Many patients are readmitted within 30 days, with significant implications for their prognosis [5]. Poor adherence to medication, diet, and self-care practices, as well as living alone,

anxiety, and depression, are critical factors for rehospitalization in HF patients [4], [5], [6].

Therefore, Comprehensive management strategies, including both pharmacologic and nonpharmacologic interventions, are essential to improve patient outcomes and quality of life. Future advancements in technology and personalized medicine hold promise for better management and treatment of heart failure [2], [3], [7]. A support-based intervention, such as a nurse-led intervention. Nurse-led interventions have been increasingly recognized for their potential to improve patient outcomes across various healthcare settings. Nursing interventions have been shown to improve patients' experiences in communicating about treatment and discharge information, as well as their overall experience, including their overall assessment of the hospital and their willingness to recommend it [8].

A nurse-led program involving telehealth interventions demonstrated significant improvements in QoL at 3 and 6 months, although these benefits diminished over time. Another study found that nurse-led interventions maintained physical and mental health status over 12 months [9]. Long-term blood pressure control has also been improved through nurse-led interventions [10]. In addition, nurse-led counseling and systematic follow-up have proven effective in reducing cardiovascular risk factors, including cholesterol levels and waist circumference [11]. However, despite the existence of nurse-led interventions, there is still little research that simultaneously measures the impact of nurse-led interventions on readmission rates and quality of life using a robust design. Therefore, based on the identified gaps, researchers sought to evaluate the effectiveness of nurse-led interventions in improving the quality of life and reducing readmission rates among patients with heart failure.

2. Methods

2.1 Research design and Review Question

Study design and review question. This study used the PRISMA-ScR (Preferred Reporting Elements for Systematic Reviews and Meta-Analyses of Exploratory Reviews) framework. The PRISMA-ScR checklist is provided as Appendix 1 (Appendix A). This design was used to investigate the effectiveness of nurse-led interventions in improving quality of life and reducing readmission rates in patients with heart failure. Therefore, the review question was: How do nurse-led

interventions improve quality of life and reduce readmission rates in patients with heart failure?

2.2 Search Strategy

Electronic databases, such as PubMed, ScienceDirect, and Taylor & Francis, were used to obtain primary studies in any language. In the search for articles, three general concepts were used to identify medical subject descriptors (MeSH) with keywords: "Heart failure" ("heart failure" OR "HF" OR "heart" AND (failure OR dysfunction)) OR ("congestive heart failure" OR "CHF") AND "Nurse-led" ("nurse" OR "nursing" OR "nurse-led" OR "nurse-managed") AND ("intervention" OR "treatment" OR "strategy") AND "Readmission" ("readmission" OR "hospital readmission" OR "re-admission") AND "Quality of life" ("quality of life" OR "health-related quality of life" OR "quality of care" OR "healthcare quality" OR "well-being" OR "life satisfaction" OR "standard of living").

All keywords were searched in titles, abstracts, and fields. Boolean operators were used in the search. Keywords within the same conceptual category were linked using 'OR', while distinct concepts were integrated using 'AND'. The logical operator "AND" was used to link key concepts. Data retrieval from the database was performed between July and August 2025. Nurse-led intervention was the independent variable, and readmission and quality of life were the dependent variables.

2.2.1 Inclusion Criteria

- Original experimental studies involving human participants
- Nurse-Led Intervention
- Rehospitalization and quality of life outcomes reported

2.2.2 Exclusion Criteria

- Review articles, conference abstracts, or editorials.
- Pharmacological or combined interventions.
- Pathological sample
- Not reported: Rehospitalization and Quality of Life outcomes

2.3 Study Selection and Data Extraction

All search records were downloaded from three databases (PubMed, ScienceDirect, and Taylor & Francis). Search results were checked for duplication using Rayyan software. Five reviewers (TP, DS, DV, RDN, and AL) independently screened search results based on identified titles and abstracts. After obtaining the full versions of all identified studies, one reviewer compiled the relevant full texts. The five reviewers also

independently assessed the full texts for inclusion using predetermined criteria. If there were discrepancies between the five reviewers' assessments, the other reviewer (TP) participated in the evaluation to resolve the issue.

2.4 Risk of Bias Assessment

We used the Cochrane risk of bias (ROB 2.0) to determine the bias of research articles.

2.5 Statistical Methods

Five reviewers (TP, DS, DH, RDN and AL) independently extracted data from the study results using Excel, with a high degree of interrelation ($\geq 95\%$). Any discrepancies were resolved by consensus with another reviewer (RDN). One reviewer (TP) extracted data from all included studies. The extracted data are presented in a table that includes demographic characteristics: (1) first author's name and year of publication, (2) sex, (3) age, (4) body weight, and (5) method of analysis, and the main findings of the studies: (1) first

author's name and year of publication, (2) variables studied, and (3) results.

3. Results

The reviewers identified 476 studies from three databases, namely PubMed, ScienceDirect, and Taylor & Francis. All studies were loaded into the Rayyan software, and 406 duplicates were removed, leaving 70. Five reviewers selected articles based on titles and abstracts, removing 62 that did not meet the predefined inclusion criteria. Subsequently, the full texts of 8 articles were evaluated for eligibility, and reasons for excluding each article were provided. A total of 3 articles were excluded due to failure to meet the eligibility criteria based on the full-text assessment and wrong outcome, leaving only 5 for review. The specific details of the selection process are best illustrated in the PRISMA flowchart (Figure 1).

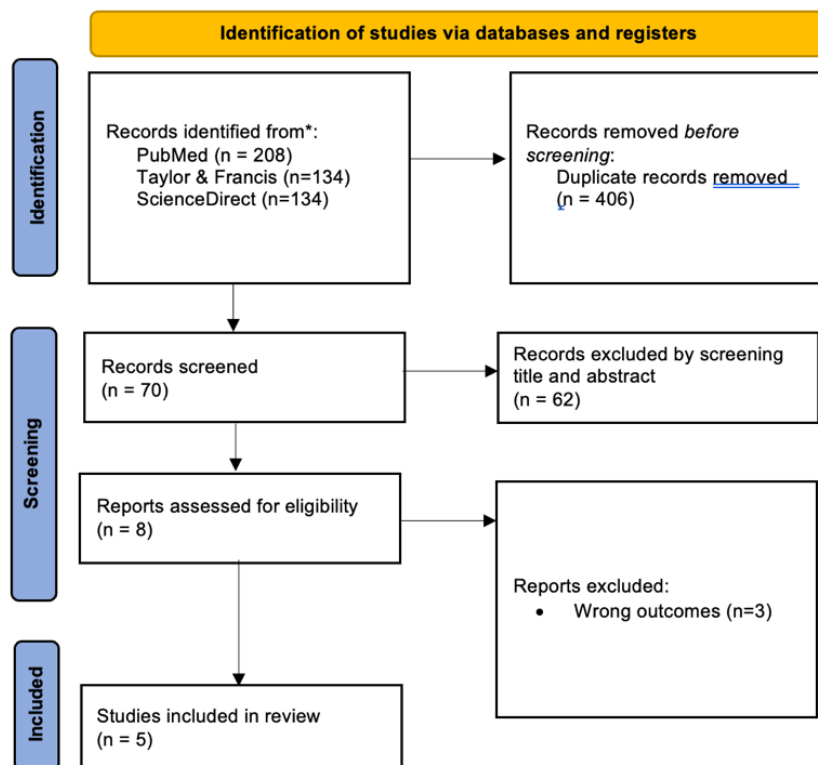


Figure 1. PRISMA flowchart of the study selection process

Notes: Adapted from Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*. 2021; [372:n71](#)

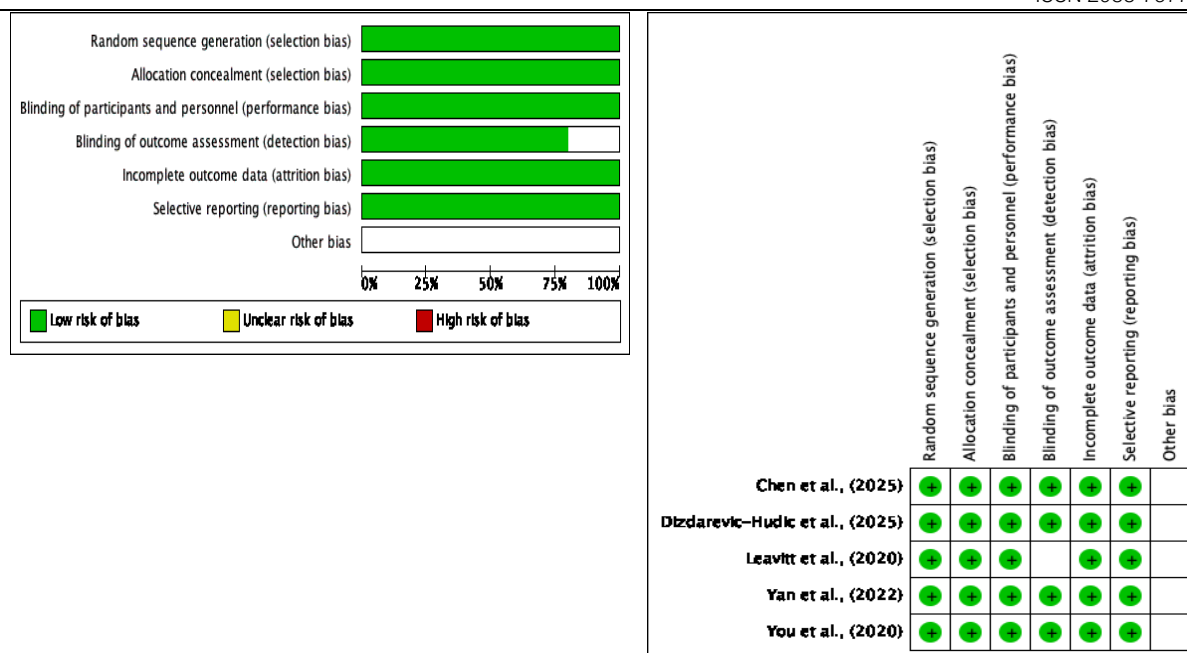


Figure 1.2 Cochrane Risk of Bias (ROB2.0) using RevMan 5.4.1

Table 1. Characteristics and Main Results of the article

Author	Study Design	Sample	Respondents	Intervention	Results
Chen et al., (2025)	RCT	Patients diagnosed with heart failure, classified as New York Heart Association functional classes I-III by a cardiologists	82 participants	the Chronic Care Model and the Collaborative Health Management Model, specifically designed for heart failure patients	all patients who survived and completed data collection at all four time points. Since no participants withdrew from the study, The dropout rate was 0% in both the intervention and control groups.
Dizdarevic-Hudic et al., (2025)	RCT	HF with reduced ejection fraction (HFrEF) patients.	64 participant	involved two groups of patients with chronic HFrEF receiving optimized guideline-directed therapy. Group 1 (32 patients) received structured education from trained nurses about disease management, medication adherence,	Educated group demonstrated significantly improved QoL. Additionally, none of the educated patients had rehospitalizations, while 34% of the non-educated group did.

Author	Study Design	Sample	Respondents	Intervention	Results
				lifestyle changes, symptom monitoring, and when to seek medical attention. Group 2 (32 patients) received standard routine care without any additional, more detailed education.	
You et al., (2020)	RCT	Exacerbation of CHF during index hospitalization, left ventricular ejection fraction (LVEF) $\leq$ 45% as assessed by echocardiography, and discharge to home with stable status.	152 Participant	Patients in the interventional group received standard care plus post-discharge program of care during the first 14 days ($\pm$ 2 days) after discharge. Patients in the control group received standard care	Indicate that among patients with CHF, a nurse-led discharge program of care can increase adherence to guideline-directed medications therapy, improve QoL, and reduce rehospitalization.
Yan et al., (2022)	RCT	Patients diagnosed with atrial fibrillation who consented.	235 participant	Participants in each group received the same standard of care, based on guidelines for the management of atrial fibrillation, provided by the nurse in charge during the pre-discharge phase. In both groups, baseline characteristics of all participants were verified by a cardiology nurse (from the multidisciplinary team) using their medical records	Patients under intervention showed a fewer cardiovascular hospitalization (17 vs. 35, $p = 0.006$) than those receiving usual care. Discernible differences were also observed in rates of cardiovascular hospitalization between the two groups (hazard ratio: 2.115, 95% confidential interval: 1,228–3,643, log-rank = 6,746, $p = 0.009$). Quality of life improved in both groups, but more significantly in the intervention group (scores: 88.0 ± 106.0 vs. 519.1 ± 120.7 at 6 months and 674.4 ± 53.4

Author	Study Design	Sample	Respondents	Intervention	Results
				and a standardized scale or questionnaire within 24 hours of assignment.	vs. 584.1 $\pm$ 105.9 at 12 months; $p < 0.001$ in both cases). Repeated measures analysis of variance showed group-time and intersubject interaction effects on patients' quality of life ($F = 9.310$, $p < 0.01$; $F = 29.042$, $p < 0.01$, respectively). No association with cardiovascular mortality was found.
Leavitt et al., (2020)	RCT	Participant had a primary or secondary diagnosis of HF and was randomized into an intervention (n = 19) or control (n = 21) group.	40 Participant	Patients in the intervention group received one visit in the hospital by the CareNavRN nurse followed by four visits by that same nurse over 30 days post-discharge. The control group received usual care, which comprised printed and verbal HF discharge education delivered by the primary hospital RN.	Hospital readmissions within 30 days occurred in six (29%) patients in the control group and three (16%) patients in the intervention group, although results were underpowered and non-significant. HF knowledge improved significantly over time in the intervention group ($p = 0.043$). Self-care maintenance ($p = 0.071$) and management ($p = 0.480$) improved over time in both groups. Confidence in heart failure self-care improved significantly over time in the intervention group ($p = 0.003$). Heart failure-related quality of life showed significant improvement over time in the intervention group ($p < 0.001$). Of the three variables that improved over time, only quality of life significantly predicted the likelihood of readmission in both groups, regardless of the intervention ($\chi^2[1] = 3.86$, $p = 0.049$, Nagelkerke's $R^2 = 0.17$).

4. Discussion

This preliminary review synthesizes evidence from five randomized controlled trials (RCTs) investigating the effectiveness of nurse-led interventions to improve quality of life (QoL) and reduce hospital readmissions in patients with heart failure (HF). Overall, the findings demonstrate that nurse-led programs meaningfully enhance QoL and may reduce rehospitalization. However, the magnitude and consistency of these effects varied across studies depending on intervention design, duration, and intensity.

The study by Chen et al. [12] implemented the Chronic Care Model and the Collaborative Health Management Model tailored for patients with heart failure. While attrition was absent in both groups, the program underscored the feasibility and sustainability of structured nurse-led care, suggesting that patients can successfully adhere to such models over time. Similarly, Dizdarevic-Hudic et al. [13] showed the strongest effect on patient readmissions: no patients in the structured nursing education group were readmitted, compared with 34% in the control group, along with a significant improvement in quality of life. In contrast, Leavitt et al. [16] observed a reduction in hospital readmission rates within 30 days (16% vs. 29% in the intervention and control groups), although the small sample size precludes this finding from having sufficient statistical power. Notably, however, HF knowledge, self-care confidence, and QoL improved significantly in the intervention group, highlighting the potential psychosocial and educational benefits of nurse-led transitional care.

Other studies emphasized broader cardiovascular outcomes. Yan et al. [15] found that nurse-led discharge and follow-up care in atrial fibrillation patients reduced cardiovascular hospitalizations (17 vs. 35; HR = 2.115, 95% CI = 1.228–3.643, $p = 0.009$) and significantly improved QoL over 12 months. Similarly, You et al. [14] reported that a nurse-led discharge program during the vulnerable 14-day post-discharge period improved medication adherence, QoL, and reduced rehospitalization in patients with chronic HF. Together, these studies underscore the consistent benefit of nurse-led interventions on QoL and their potential to lower rehospitalization rates when structured, sustained, and integrated into discharge planning.

Our synthesis aligns with recent systematic reviews and meta-analyses that evaluated nurse-led interventions across various contexts. A meta-analysis of nurse-led education in HF patients demonstrated significant improvements in QoL and reductions in HF-related readmissions, though effects on all-cause readmission were inconsistent [17]. Similarly, a review of nurse-led HF clinics showed improvements in patient-reported QoL, but highlighted variability across instruments and contexts [12]. A broader scoping review of nurse-led self-care interventions also confirmed benefits for QoL and symptom burden but found limited impact on emergency visits or all-cause rehospitalization [18]. These patterns mirror our findings: nurse-led interventions appear most effective at enhancing QoL, while their impact on rehospitalization depends on the intervention's timing, duration, and intensity.

Several mechanisms may account for these outcomes. Nurses provide tailored education that promotes medication adherence, lifestyle modification, and symptom monitoring, which together enhance self-care behavior and patient empowerment. Psychosocial support also contributes significantly by reducing anxiety and depression, factors strongly associated with poor outcomes and readmissions in HF patients [19], [20]. Moreover, the frequent contact and continuity afforded by nurse-led transitional programs facilitate early detection of symptom exacerbation, allowing timely intervention before hospitalization becomes necessary.

The variability in outcomes across studies highlights the importance of intervention characteristics. High-intensity and multimodal programs, such as those involving structured education, collaborative management, and follow-up monitoring, demonstrated the greatest reductions in rehospitalization [13], [15]. Conversely, interventions with shorter duration or limited intensity, while improving QoL, were less consistently associated with reduced rehospitalization [16]. These findings are corroborated by Li et al. [21], who reported a dose-response relationship in transitional care, with greater intensity and duration of nurse follow-up producing larger reductions in HF-specific readmissions.

The implications of these findings for practice and policy are considerable. Nurse-led interventions should be integrated into routine HF

management, particularly during transitional care following hospital discharge, when patients are most vulnerable to readmission. Training programs for nurses should emphasize not only clinical management of HF but also skills in patient education, motivational interviewing, and the use of telehealth technologies. At the health system level, reimbursement and policy structures should recognize and support the critical role of nurses in managing chronic diseases such as HF. Importantly, nurse-led care models may be especially valuable in resource-limited settings, where physicians are less available, and nurses serve as primary patient educators and coordinators.

Despite promising evidence, significant gaps remain. Few studies have evaluated the results beyond 12 months, which creates uncertainty about the long-term sustainability of the benefits. Cost-effectiveness analyses were scarce, which limits the ability of policymakers to justify scaling interventions. Heterogeneity in QoL instruments and rehospitalization definitions complicates cross-study comparisons. In addition, most of the included studies were conducted in high-income countries, which limits their generalizability to the context of low- and middle-income countries, where the burden of heart failure is increasing.

This scoping review has notable strengths, including its comprehensive mapping of evidence focused on two critical outcomes, QoL and rehospitalization, and the inclusion of recent trials up to 2025. However, its limitations must be acknowledged. Because we did not conduct a meta-analysis, we cannot quantify pooled effects or assess heterogeneity statistically. Potential publication bias is also possible, given that positive results are more likely to be published. Finally, the heterogeneity of interventions, populations, and outcome measures across studies limits the certainty with which conclusions can be generalized.

Future research should address these shortcomings by conducting large-scale, multicenter, randomized clinical trials with standardized intervention components and consistent outcome measures. Long-term follow-up (≥ 12 months) is essential to assess the durability of effects, and economic analyses should be incorporated to determine cost-effectiveness. Research should also focus on diverse populations, particularly older adults with multimorbidity and patients in low-resource settings. Implementation

science approaches could help identify barriers and facilitators to adopting nurse-led interventions at scale, ensuring that effective models are translated into sustainable clinical practice.

These findings reinforce Orem's Self-Care Deficit Nursing Theory (OSCDNT) with evidence that nurse-led interventions are effective in closing the self-care gap in heart failure patients through patient and family education, remote monitoring, and self-care skills training. This supports the core concept of OSCDNT: nursing interventions are necessary when patients experience deficits in self-care abilities. With nurse interventions, patients can be more independent in managing their chronic conditions [22]. Furthermore, research results showing improvements in mental health, decreased depression and anxiety, and improved quality of life are in line with the role of OSCDNT in optimizing physical and psychological aspects [23]. These findings also modify the application of the theory by emphasizing the importance of integrating telehealth technology and family involvement as external factors that strengthen the effectiveness of OSCDNT-based interventions, thus not only improving patient self-care but also contributing to reduced rehospitalization rates and healthcare costs.

Family participation in nurse-managed interventions is crucial for improving the quality of life and reducing the frequency of rehospitalizations in patients with heart failure. Emotional and psychological support from families has been shown to improve patients' mental health, improving overall quality of life [24]. Furthermore, family participation plays a role in improving self-management and adherence, including monitoring the patient's health status and ensuring adherence to treatment. Families play a crucial role in strengthening communication among patients, healthcare professionals, and the nursing team, which helps facilitate more accurate decision-making and a focus on the patient's needs [25]. Various nurse-led intervention programs, such as education, counseling, telehealth services, and family follow-up, effectively improve patient knowledge, skills, and emotional support [26]. Family involvement in a multidisciplinary approach produces more clinically and socially comprehensive outcomes. Several studies have shown that patients' quality of life improves in the short and long term [27], along with reduced rehospitalization rates and associated medical costs [28]. Therefore, involving families in nurse-led

interventions should be considered a crucial aspect of clinical practice to achieve the best outcomes for patients with heart failure and their families.

Reducing rehospitalizations in patients with heart failure not only improves quality of life but also makes a significant contribution to lowering healthcare costs. Several nurse-led interventions involving patients and their families are successful, including telemonitoring, which can reduce healthcare costs by up to 68.3% by reducing hospitalizations and patient transportation costs. Disease management programs that include education, health coaching, and remote monitoring have also shown significant cost savings while improving patient outcomes. A nurse practitioner-led care management model effectively reduces medical costs and improves patient self-efficacy, with an average savings of \$6147.94 [29]. A post-discharge intervention, which includes home visits by nurses specialized in heart failure care, has been shown to reduce rehospitalization rates from 78% to 37% over six months, with a potential savings of €2266 per patient per year. Furthermore, remote monitoring devices saved \$6723 over five years by reducing rehospitalization rates [30]. In contrast, a therapeutic education program delivered through home visits and telephone calls by nurses significantly reduced rehospitalizations and saved costs [31]. Thus, patient and family participation in nurse-led interventions has been shown to improve quality of life, reduce rehospitalization rates, and be a cost-effective strategy to reduce the economic burden of heart failure.

The implications of this study suggest that nurse-led interventions for heart failure patients need to be expanded. This is crucial for improving quality of life and reducing hospital readmission rates, as well as for assessing mortality, functional outcomes, and long-term sustainability. Future research should consider cost-effectiveness, the context of low to middle-income countries, tailoring interventions to individual needs, and integrating digital technology. Furthermore, impacts on families and implementation research related to nurse workload and the health system are crucial to ensure these interventions' broad implementation and sustainability.

5. Conclusion

In conclusion, this scoping review provides evidence that nurse-led interventions improve QoL and show potential to reduce rehospitalization among HF patients. Their effectiveness appears

strongest when programs are intensive, comprehensive, and sustained over time. Although the current literature provides encouraging results, future research should focus on long-term outcomes, economic evaluation, and broader implementation. Strengthening nurse-led care in the management of heart failure has the potential to improve patient outcomes and reduce the burden on healthcare systems worldwide. Limitations in the evaluation timeframe for readmissions also varied across studies (e.g., 30 days, 90 days, or 12 months after hospital discharge), which limits the ability to draw uniform conclusions regarding the long-term impact of the intervention.

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7. References

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