

REVIEW ARTICLE

Effects of Nurse-Led Interventions on Comprehensive Rehabilitation of Atrial Fibrillation: A Systematic Review And Meta-Analysis

Kaili Zhao, MM; Zhenyang Fu, MM; Fei Wang, MM; Xingyu Wei, BM; Xiaofang Che, PhD

ABSTRACT

Objective • This meta-analysis aimed to assess and evaluate the effect of nurse-led health management on the quality of life of patients with atrial fibrillation.

Methods • We compared the outcomes of patients who received nurse-led intervention during hospitalization with those who did not, using a systematic retrospective and randomized controlled trial (RCT) analysis. We searched the studies in Cochrane Central Register, including PubMed, EmBase, Web of Science, Cochrane Library, WAN Data, CBM, CNKI, etc. Bias risks included in the study were evaluated by Cochrane Bias risk tool, and combined risk estimates were calculated. The main endpoints are the SF-36 and HADS scores and endpoints after surgery. We used a random effects model to combine the data. For continuous variables (such as SF-36 and HADS scores), we used standard mean difference for analysis, and for binary variables (such as the presence or absence of mental health problems), we used hazard ratio for analysis. The data are based on fixed or stochastic effects models, with standard mean differences and risk ratios for continuous and heterotaxic variables.

Results • 3064 patients from 7 clinical studies were included in this meta-analysis. Postoperative SF-36 scores at 6 months in the nurse-led group were significantly higher than those in the routine nursing group in Role-Physical and Mental health. Postoperative SF-36 scores at 12 months in the nurse-led group were not significantly higher than those in the routine nursing group. The

nurse-led group had a significantly lower HADS depression score than the conventional care group, but there was no significant difference in HADS anxiety score between the two groups.

Conclusion • The main findings of this meta-analysis are that the nurse-led comprehensive management of atrial fibrillation can significantly improve the role-physical and mental health status of SF-36, reduce the HADS depression score, the incidence of cardiovascular hospitalization and atrial fibrillation at 6 months atrial fibrillation surgery. Additional high-quality RCTs should be conducted in the future. nurse-led interventions have the potential to significantly impact the care of patients with atrial fibrillation. By providing comprehensive management, education, and support, nurses can improve patient outcomes, enhance quality of life, and reduce healthcare burdens for both patients and providers. While this meta-analysis provides valuable insights, there are limitations that should be considered. Standardizing interventions and outcome measures, conducting larger studies with longer follow-up periods, including diverse populations and settings, and assessing the economic impact of nurse-led interventions are potential directions for future research in this field. Addressing these limitations would provide a more comprehensive understanding of the role of nurse-led interventions in the care of patients with atrial fibrillation. (*Altern Ther Health Med*. 2024;30(1):36-43).

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INTRODUCTION

Atrial fibrillation (atrial fibrillation) is one of the most common arrhythmias in clinical practice, characterized by disordered and uncoordinated atrial electrical activity, which can easily lead to intra-atrial thrombosis, thereby increasing the risk of thromboembolism. Atrial fibrillation can worsen heart failure, reduce the quality of life, and increase mortality.^{1,2} Data shows: In 2010, there were 33.5 million atrial fibrillation patients

in the world, and with the aging process of the population, the prevalence of atrial fibrillation has increased greatly.³ At present, there are still many challenges in the global management of atrial fibrillation, such as the substandard rate of anticoagulation therapy for atrial fibrillation, lack of awareness of atrial fibrillation hazards among doctors and patients, poor compliance with guidelines, and lack of standardization of atrial fibrillation training, which lead to a lack of atrial fibrillation management. The general process of nurse-led comprehensive management of atrial fibrillation was as follows: (1) screening community residents with atrial fibrillation risk factors or atrial fibrillation symptoms; (2) Patients with newly diagnosed atrial fibrillation made an appointment with the atrial fibrillation clinic nurse for a comprehensive assessment; Treatment was discussed by an atrial fibrillation clinic team member and initiated in accordance with guidelines; (4) Patients were followed up regularly by nurses, and individualized health education was provided to patients and their caregivers.⁴

Integrated management is critical for patients with atrial fibrillation because it is a multifaceted disease.⁴ Atrial fibrillation involves complex pathophysiological mechanisms and may have multiple clinical manifestations. It often accompanies comorbidities such as high blood pressure, diabetes, heart failure, and valvular heart disease. In addition, AF can lead to complications such as stroke, thromboembolism and impaired heart function. Therefore, integrated management is needed to address the multiple aspects of AF to provide optimal care. Every patient with atrial fibrillation is unique, and their treatment needs may vary based on factors such as age, severity of symptoms, comorbidities, and risk of complications. Integrated management involves tailoring interventions to individual characteristics and preferences. An individualized approach that includes risk stratification, rhythm control strategies, anticoagulant therapy, and lifestyle changes can help optimize patient outcomes and improve their quality of life. Integrated management has shown encouraging results in improving patient outcomes and quality of life.⁴ A proactive and comprehensive approach that combines pharmacological interventions, lifestyle changes (such as weight management, exercise, and moderate alcohol consumption), and psychological support can help reduce atrial fibrillation symptoms, prevent complications, and enhance overall well-being. It can also enable patients to actively engage in self-care and make informed decisions about treatment. Integrated management also emphasizes regular monitoring, timely follow-up, and doctor-patient decision-making. By addressing all aspects of atrial fibrillation and tailored care to individual needs, integrated management aims to achieve better symptom control, reduce hospitalizations, prevent complications, and improve long-term outcomes. In summary, due to the multifaceted nature of atrial fibrillation, comprehensive management is essential for patients with atrial fibrillation. Through an individualized approach that considers the unique characteristics of each patient, outcomes and quality of life can be improved. By addressing all aspects of AF with an integrated multidisciplinary, integrated care approach, healthcare providers can optimize care and empower patients to manage their disease more effectively. The current literature lacks a clear understanding of the effect of nurse-led health management on the quality of life of atrial fibrillation patients. While comprehensive management is recognized as important, the specific impact of nurse-led interventions in this context remains unclear. Further research is needed to explore the role of nurses in managing atrial fibrillation and the potential benefits they can bring to patients' quality of life.

At present, the disease management of patients with atrial fibrillation mainly focuses on the popularization of health education at the community level, and there is a lack of targeted management and advice for different patients' families.⁵ Nurse-led health management can be more targeted to implement personalized quality of life management for different patients. The effect of nurse-led health management

on the management of atrial fibrillation is still unclear. Therefore, this study aims to evaluate the effect of nurse-led health management on the quality of life of patients with atrial fibrillation by Meta-analysis, integrating relevant randomized controlled trials and small sample studies. Comprehensive patient education, regular monitoring, support, and personalized care plans can lead to better disease management, reduced symptom burden, and improved overall well-being for atrial fibrillation patients. The findings of this meta-analysis will offer valuable insights into the effectiveness of nurse-led health management interventions for atrial fibrillation patients. These insights can inform and potentially transform clinical practice by promoting the integration of nurse-led interventions, encouraging collaborative care, promoting patient education and self-management, and enhancing patient-centered care.

METHODS

We performed detailed searches of clinical studies in major electronic databases such as PubMed, EmBase, Web of Science, Cochrane Library, Bank Data, CBM, and CNKI. The search was conducted using a combination of keywords and their synonyms. The specific keywords used for each database are listed below: PubMed: "nurse led" AND "atrial fibrillation". EmBase: ("nurse led" OR "nurse-led" OR "nursing intervention") AND ("atrial fibrillation" OR "AF"). Web of Science: TS=("nurse led" OR "nurse-led" OR "nursing intervention") AND TS=("atrial fibrillation" OR "AF"). Cochrane Library: ("nurse led" OR "nurse-led" OR "nursing intervention") AND ("atrial fibrillation" OR "AF"). Bank Data: ("nurse led" OR "nurse-led" OR "nursing intervention") AND ("atrial fibrillation" OR "AF"). CBM: ("nurse led" OR "nurse-led" OR "nursing intervention") AND ("atrial fibrillation" OR "AF"). CNKI: ("护士领导" OR "护士主导" OR "护理干预") AND ("房颤" OR "心房颤动"). The search results will include studies published up to January 2023.

Study selection and eligibility criteria

The inclusion and exclusion criteria were carefully chosen to ensure the selection of relevant studies that meet the objectives of the meta-analysis. Each criterion was designed to enhance the validity and reliability of the included studies. Below is the rationale for the specific criteria: Aged ≥ 18 years diagnosed with atrial fibrillation: Restricting the study population to individuals aged 18 years and above ensures that the analysis focuses on adult patients who are more commonly affected by atrial fibrillation. This criterion helps maintain consistency and relevance within the scope of the study. Diagnosis confirmed by a cardiologist using a 12-lead ECG recording: Including only studies where atrial fibrillation diagnosis was confirmed by a cardiologist using a 12-lead ECG recording ensures accuracy and consistency in patient identification. This criterion minimizes the risk of including patients with misdiagnosed or milder forms of arrhythmias. Nursing interference in daily life: This criterion aims to include studies that specifically evaluate nurse-led interventions

designed to impact patients' daily life and well-being. It ensures that the selected studies address the role of nursing in managing atrial fibrillation patients comprehensively. Randomized controlled trials (RCTs) or comparative studies: By limiting the inclusion to RCTs or comparative studies, we prioritize robust study designs that provide higher-quality evidence. These study designs minimize biases and confounding factors, thereby improving the reliability of the findings. Studies reporting relevant outcome measures: Including studies that report outcome measures such as SF-36 and HADS scores ensures that the meta-analysis can assess the impact of nurse-led interventions on patients' quality of life outcomes. By requiring at least one of these indicators, we focus on studies that provide comprehensive data on patients' psychological well-being, functional status, and symptom burden. Exclusion criteria: Other types of surgery: Excluding studies involving other types of surgery helps maintain the focus specifically on atrial fibrillation patients and their management. This criterion ensures homogeneity in the study population. Insufficient data: Excluding studies with insufficient data prevents the inclusion of studies that lack necessary information for meaningful analysis. This criterion ensures the reliability and quality of the included studies. Case reports, summaries, or comments: Excluding case reports, summaries, and comments restricts the inclusion to original research studies, which provide more comprehensive data for analysis. This criterion maintains methodological rigor and reduces the risk of bias introduced by less rigorous study designs. By applying these selection and eligibility criteria, we aim to ensure the inclusion of high-quality studies that are most relevant to our research question, thereby increasing the validity and generalizability of the meta-analysis findings. (Table 1).

Data extraction

Two independent reviewers will be responsible for extracting data from the eligible studies. The following information will be extracted from each study: author, year of publication, study design, country where the study was conducted, sample size, gender distribution within the sample, BMI (Body Mass Index), nurse-led interventions implemented in the study, patient age, and outcome measures. Regarding outcome measures, we aim to extract data related to postoperative outcomes that can assess the effectiveness of nurse-led interventions for atrial fibrillation patients. These outcome measures may include but are not limited to: Surgical Complications: Information on any postoperative complications such as infections, bleeding, thromboembolic events, or cardiac events will be extracted. This data will help evaluate the impact of nurse-led interventions on reducing surgical complications and improving patient safety. Quality of Life Measures: We will extract data on validated questionnaires used to assess patients' quality of life, such as the SF-36 questionnaire. This will provide insights into the impact of nurse-led interventions on patients' physical functioning, mental well-being, and overall quality of life. Symptom Burden: Data related to symptoms experienced by atrial fibrillation patients postoperatively, such as palpitations, shortness of breath, fatigue, or chest discomfort, will be extracted.

This information will help evaluate the effectiveness of nurse-led interventions in managing and alleviating symptoms. Functional Status: We will extract data related to patients' functional status, including their ability to perform daily activities, exercise tolerance, and return to normal activities following surgery. This data will provide insights into the impact of nurse-led interventions on promoting patient recovery and optimizing functional outcomes. Patient Satisfaction: Information on patient satisfaction with nurse-led interventions or care received postoperatively will be extracted. This outcome measure reflects patients' perception of the quality and effectiveness of the interventions provided by nurses. By collecting and analyzing data on these outcome measures, we aim to comprehensively evaluate the impact of nurse-led interventions on atrial fibrillation patients' postoperative outcomes. The extracted data will be thoroughly discussed and any discrepancies or disagreements will be resolved through consensus among the reviewers. All extracted data will be documented in a standardized Excel file to ensure consistency and facilitate further analysis.

Quality evaluation

The risk of bias in the included RCT studies will be assessed using the Cochrane Collaboration's tool for assessing the risk of bias (RoB). This tool assesses the studies' risk of bias across different domains, including random sequence generation, allocation concealment, blinding, incomplete outcome data, selective reporting, and other sources of bias. Due to the nature of nurse-led interventions, it may not be possible to blind participants or personnel to the intervention. Therefore, we will not assess the blinding domain when evaluating the risk of bias in the selected studies. Each study will be evaluated according to the type of bias and rated as either low risk of bias, high risk of bias, or unclear risk of bias. We aim to provide a comprehensive and transparent assessment of the included studies' methodological rigor to ensure the validity and reliability of the meta-analysis findings. By utilizing the Cochrane Collaboration's RoB tool, we will assess the risk of bias across multiple domains and provide a thorough evaluation of the potential biases in the included studies. This approach will help ensure that the meta-analysis findings are based on sound and reliable evidence.

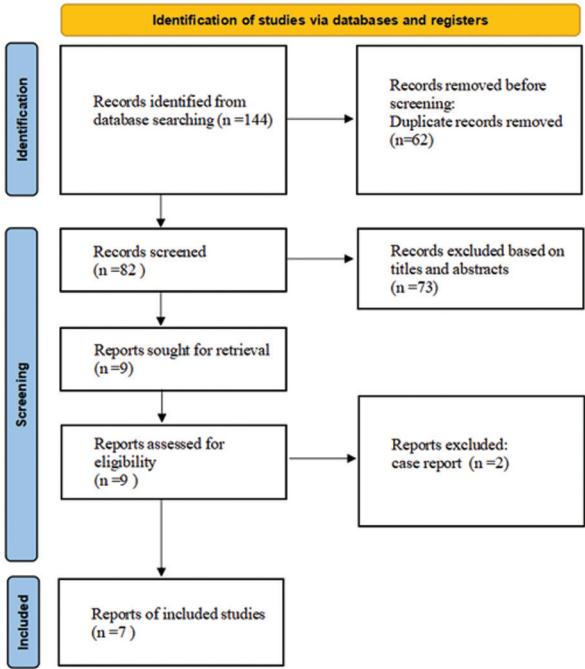
Statistical analysis.

In the subcohort study and meta-regression analysis, we plan to utilize appropriate statistical tests to identify the sources of heterogeneity. These may include subgroup analysis, meta-regression analysis, or other relevant methods based on the characteristics of the included studies and the research question. The specific tests will depend on the nature of the data and the potential sources of heterogeneity. To determine whether to apply the random effects or fixed effects model for meta-analysis, we will consider the results of the heterogeneity test. If the probability effect (P value) or statistical qualitiveness is relatively high, indicating significant heterogeneity among the studies, we will utilize

Table 1. Characteristics of included studies

Author	Year	Country	Study design	Sample size		Gender (M/F)		Age (year)		BMI(kg/m ²)		Nurse-led intervention	Outcome measure
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John	2017	Australia	RCT	22	19	11/8	16/6	63.9±10.2	58.3±10.9	27±3	28±3	A session of in-hospital face-to-face on admission and prior to discharge (30 minute duration), and telephone calls at two weeks, one month and three months post-procedure	SF-36 atrial fibrillation Symptom Checklist
Yan	2016	China	RCT	116	119	75/41	69/50	65.0 ± 11.5	65.4 ± 10.4	25.7 ± 3.2	25.9 ± 3.1	The specialist cardiac nurse determined patients' health requirements in a face-to-face interview to offer individualized guidance for future follow-up.	Cardiovascular hospitalization, Cardiovascular death, SF-36 Quality of Life scores
Jeroen	2012	Netherlands	RCT	356	356	197/159	221/135	66 ± 13	67 ± 12	NA	NA	nurse-led outpatient care steered by decision support software based on the guidelines ² and supervised by a cardiologist	Cardiovascular death, Cardiovascular hospitalization, Arrhythmic events
Li	2022	Hong Kong	RCT	20	20	13/7	13/7	71.6±3.89	72.6±5.77	24.15±4.53	24.49±2.92	(i) risk profile assessment and shared decision-making regarding OAC use; (ii) empowerment-based educational module on atrial fibrillation self-care; (iii) nurse-initiated telephone support; (iv) patient-initiated contact for professional advice.	atrial fibrillation effect on quality-of-life scale; atrial fibrillation knowledge scale; hospital anxiety and depression scale, Morisky–Green–Levine adherence scale
Petra	2020	Netherlands	RCT	671	683	450/221	441/242	64 ± 10	64 ± 11	28 ± 5	28 ± 5	treatment of patients by a specialized nurse using guidelines-based decision-support software	Cardiovascular death, Cardiovascular hospitalization, Arrhythmic events
M. L.Hendriks	2014	Netherlands	RCT	286	248	174/112	141/107	66.4±12.4	66.9±11.5	NA	NA	Patients allocated to the nurse-led care, underwent protocolized diagnostic procedures prior to their first visit to the outpatient clinic.	protocolized diagnostic procedures prior to their first visit to the outpatient clinic. Anurse specialist then took the patients' medical history and extensi
Du	2020	China	RCT	80	68	53/27	39/29	64.21±11.86	64.34±10.87	25.7 ± 3.3	25.82 ± 3.39	a continuous care by a nurse-led multidisciplinary team	quality of life, re-admission incidences of cardiovascular events

Figure 1. The flow chart of studies selecting



the random effects model. This model takes into account both within-study and between-study variability, assuming that the true effect sizes may vary across studies. On the other hand, if the heterogeneity is low ($P \geq .05$ or $I^2 \leq 50\%$), suggesting no substantial variation beyond chance, we will employ the fixed effects model. This model assumes a common true effect size for all included studies. Sensitivity Analysis and Publication Bias: Sensitivity analysis is crucial to assess the robustness of the combined results. By omitting individual studies one by one and re-analyzing the data, sensitivity analysis allows us to evaluate the influence of each

study on the overall findings. This analysis helps ensure that the results are not driven solely by a single study and confirms the stability and reliability of the meta-analysis results. To investigate publication bias, we will conduct the Begg test and the Egger test. The Begg test examines any correlation between the effect sizes and their variances, providing an indication of potential publication bias. The Egger test, on the other hand, assesses the asymmetry in a funnel plot to detect small-study effects that may arise from publication bias. These tests help us evaluate whether there is a systematic bias in the published studies, which could affect the overall conclusions. By performing sensitivity analysis and assessing publication bias using the Begg test and the Egger test, we aim to ensure the validity and reliability of our meta-analysis results. These steps help address potential biases and provide a more accurate estimation of the true effect sizes and their associated uncertainties.

RESULTS
Results of literature retrieval

The reviewers identified 144 published articles that were potentially relevant to our study. A total of 62 duplicate articles were excluded. By conducting a preliminary screening of the titles and abstracts of the articles, 73 studies were excluded. Atrial fibrillation perusing the full text, 2 studies were excluded because they were case report studies. Finally, seven studies were included in the meta-analysis.⁷⁻¹⁴ Finally, see Table 1 for features included in the study. The literature retrieval flow is shown in Figure 1.

Study on characteristic

Seven studies were included in our meta-analysis, involving a total of 19-683 patients. These studies were published between 2012 and 2022, with three conducted in China, three in the Netherlands, and one in Australia. The patient population and

Table 2. Risk of bias assessment of the RCTs

Study	Random sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Incomplete outcome data	Selective reporting	Other bias
Bowyer et al.	Low risk	Low risk	Low risk	Unclear risk	Low risk	Low risk	Low risk
Yan et al.	Unclear risk	Unclear risk	Unclear risk	Low risk	Low risk	Low risk	Low risk
Hendriks2012 et al.	Low risk	Low risk	Low risk	Unclear risk	Low risk	Low risk	Unclear risk
Li et al.	Low risk	Unclear risk	Low risk	Unclear risk	Low risk	Low risk	Low risk
Petra et al.	Low risk	Low risk	Low risk	Unclear risk	Low risk	Low risk	Low risk
M. L.Hendriks2013 et al.	Low risk	Unclear risk	Unclear risk	Unclear risk	Low risk	Unclear risk	Unclear risk
Du et al.	Low risk	Low risk	Unclear risk	Unclear risk	Low risk	Low risk	Low risk

surgical procedures varied across the studies, reflecting a diverse range of settings and populations. Baseline features of the selected studies were extracted and presented in Table 1.

Quality of methodology

The included studies were all randomized controlled trials (RCTs) with clear inclusion and exclusion criteria. The methods of randomization were described in all studies, but concealment of allocation was not consistently reported. Measurement bias was considered to be low since most outcome measures were objective. All RCTs reported complete outcome indicators. A detailed assessment of the methodological quality of each study is provided in Table 2.

Postoperative SF-36(6m)

Postoperative SF-36 scores at 6 months were compared in three articles. The results of the Meta-analysis showed that there was significant heterogeneity among the studies, so the random effect model was used for pooling. The results showed that the Postoperative SF-36 scores at 6 months in the nurse-led group were significantly higher than those in the routine nursing group in Role-Physical and Mental health (RR = 0.812; 95%CI = 0.116-1.509, I^2 = 89.5%, P = .0001; RR= 0.692; 95%CI= 0.253-1.132, I^2 = 74.7%, P = .002). See Figure 2 for details.

Postoperative SF-36 (12m)

Postoperative SF-36 scores at 12 months were compared in two articles. The Meta-analysis results showed significant heterogeneity among the studies, so the random effect model was used for pooling. The results showed that the Postoperative SF-36 scores at 12 months in the nurse-led group were no significantly higher than those in the routine nursing group. See Figure 3 for details.

HADS scores

Postoperative HADS scores were compared in 2 articles. Meta-analysis showed distinct heterogeneity of HADS anxiety among the studies, integrating them using a stochastic effect model. Results The depression score of the nursing group was significantly lower than that of the normal nursing group, but the anxiety score had no obvious difference. See Figure 4 for details.

Endpoint

The terminus of the three articles has been compared. Meta-analysis showed significant heterogeneity in cardiovascular death across each study, which was matched

Figure 2. Forest graphs compared the postoperative SF-36 (6m) of Nurse-led care and conventional surgery groups.

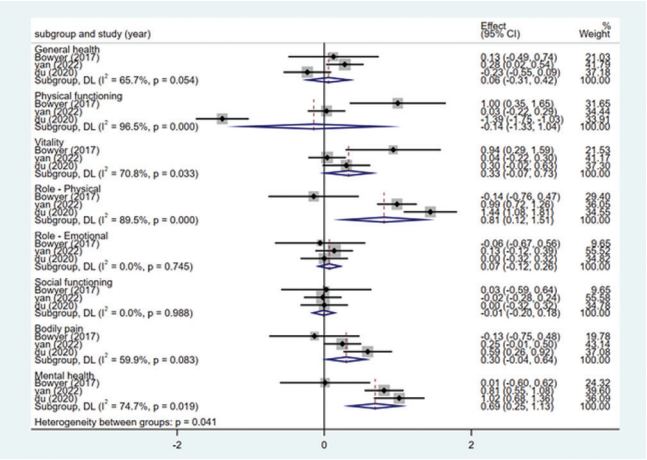
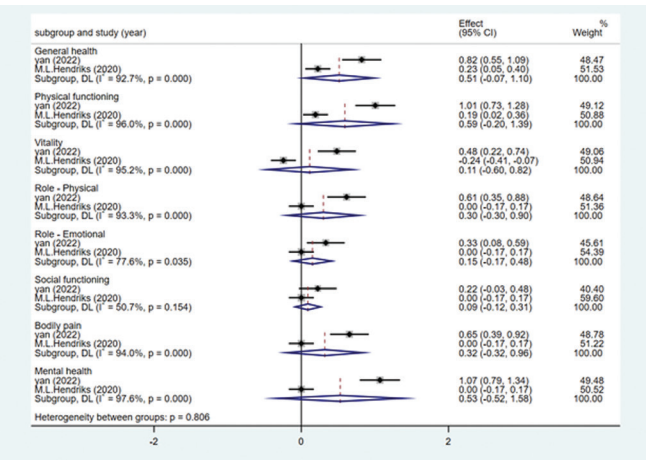


Figure 3. Forest graphs compared the postoperative SF-36 (12m) of Nurse-led care and conventional surgery groups.



by the application of a random-effects model. The results showed that the incidence of Cardiovascular hospitalization and Atrial fibrillation in the nurse-led group was significantly lower than that in the routine care group. However, the two groups had no significant difference in Cardiovascular death and Heart failure. See Figure 5 for details.

The findings are presented separately for each outcome measure, including Postoperative SF-36 scores at 6 months and 12 months, HADS scores, and endpoint outcomes. The Postoperative SF-36 is a widely used measure of health-related quality of life, assessing both physical and mental health aspects. HADS scores evaluate anxiety and depression levels. The endpoint outcomes include cardiovascular death, cardiovascular hospitalization, atrial fibrillation, and heart

Figure 4. Forest graphs compared the HADS scores of Nurse-led care and conventional surgery groups.

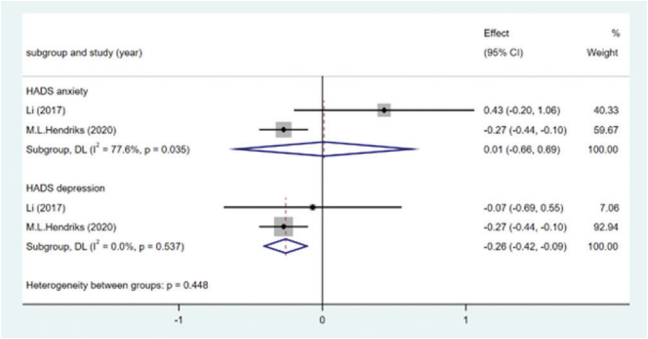
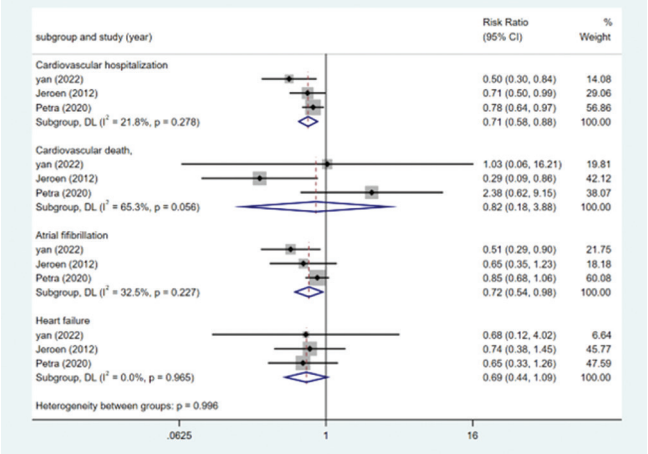


Figure 5. Forest graphs compared the Endpoint of Nurse-led care and conventional surgery groups.



failure. Significant heterogeneity was observed among the included studies for some outcomes. To account for this variability, we used a random-effects model for pooling the data. The reasons for heterogeneity may include differences in patient characteristics, surgical techniques, or variations in nursing care practices.

In summary, our meta-analysis showed that the nurse-led group had significantly higher Postoperative SF-36 scores at 6 months compared to the routine nursing group in Role-Physical and Mental Health domains. However, there were no significant differences in Postoperative SF-36 scores at 12 months between the two groups. The nursing group had significantly lower HADS depression scores than the routine nursing group, but no significant difference was found in anxiety scores. The nurse-led group also had lower incidence of cardiovascular hospitalization and atrial fibrillation compared to the routine care group, while no significant differences were observed in cardiovascular death and heart failure. These findings suggest that nurse-led care may have a positive impact on certain patient outcomes.

DISCUSSION

Early diagnosis and whole-course nursing management of atrial fibrillation are still a major challenge. Many patients are found to have atrial fibrillation only when they go to the

hospital due to acute cardiovascular disease or stroke. Systematic screening, early diagnosis, and early nursing management of high-risk groups are of great significance for stroke prevention in patients with atrial fibrillation.^{15, 16} ESC guidelines proposed that the management of atrial fibrillation involves five aspects: management in the acute phase, treatment of underlying or concomitant cardiovascular diseases, stroke prevention, heart rate control, and rhythm control. This makes atrial fibrillation management complex. The study believes that nurses account for more than half of the medical team and have the longest contact time with patients in clinical medical behavior.^{17,18} They have rich experience in consulting and guiding patients and can provide better management education for patients in the whole management of patients with atrial fibrillation.¹⁹

In this case, the SF-36 score of the nurse-led group was significantly higher than that of the routine nursing group at 6 months of atrial fibrillation operation, which may be related to the implementation of the nurse-led atrial fibrillation nursing model based on guidelines for patients with comprehensive, systematic, standardized diagnosis and treatment and continuous care, so as to enhance the treatment compliance of patients with atrial fibrillation. The trial fibrillation of anticoagulation and the effectiveness of heart rate and rhythm control are improved, thereby reducing the occurrence of disease-related symptoms and improving the quality of life, which is conducive to the improvement of physical function and mental health.²⁰

In this case, the HADS depression score of the nurse-led group was significantly lower than that of the routine nursing group, while the HADS anxiety score had no significant change between the two groups. Based on the nurse-led nursing intervention of atrial fibrillation, the patients' etiology, personality changes and other basic information were fully analyzed, and the nursing statrial fibrillationf helped the patients to formulate a series of methods to relieve depression and stress according to their own personality and hobbies, such as fitness and travel, to relieve the pressure brought by work and life. In addition, this study also encourages patients' family members to participate in their behavior management so that patients can feel the support from their families and improve the quality of life of patients.^{21,22} The short-term improvement in depression is more obvious than the improvement in anxiety, so the depression score is significantly lowered, and the improvement in anxiety should be studied further with a longer visit time. Studies have shown that anxiety and depression are important predictors of quality of life in patients with atrial fibrillation and other cardiovascular diseases. So is what we found. TThe focus of psychological care for patients with atrial fibrillation is to reduce depression, and it is an important component part of nursing.²³

The incidence of cardiovascular hospitalization and atrial fibrillation in the nurse-led group was significantly lower than that in the usual care group. LAMBRINO²⁴ study showed that the nurse-led research protocol could

reduce the all-cause mortality and hospitalization rate, which was consistent with this study's conclusions. It is suggested that the new nursing team management model led by hospital nurses is beneficial to reduce the risk of atrial fibrillation and rehospitalization rate. The implementation of a nurse-led management mode, taking the community as the carrier and the family as the unit, realizes the tripartite interactive adaptation system, which can achieve resource complementarity and service continuity.

Despite the overall positive findings of our meta-analysis, it is important to acknowledge several limitations. First, the included studies exhibited heterogeneity in terms of study design, intervention types, and outcome measures, which may introduce some degree of variability and potential bias. While we implemented rigorous inclusion criteria and conducted sensitivity analyses to address this issue, there may still be some residual heterogeneity. Second, publication bias is a concern in any meta-analysis. Although we attempted to minimize this bias by conducting a comprehensive literature search and including both published and unpublished studies, it is still possible that some relevant studies were missed.

Additionally, studies with negative or non-significant findings are less likely to be published, potentially leading to an overestimation of the intervention effects. Third, the quality of the included studies varied, and some had a potential risk of bias. We assessed the quality of each study using established criteria and performed subgroup analyses to explore sources of heterogeneity. However, the potential impact of study quality on the overall results cannot be completely ruled out. In terms of implications for clinical practice, our findings suggest that nurse-led interventions can effectively improve outcomes in patients with atrial fibrillation. These interventions, such as patient education and self-management support, have the potential to enhance patient empowerment, promote medication adherence, and reduce hospitalization rates. Clinicians should consider incorporating these nurse-led interventions into their practice to optimize patient care. However, it is important to note that individual patient characteristics and preferences should also be taken into account when implementing these interventions. Moreover, further research is needed to determine the optimal components, delivery methods, and long-term effects of nurse-led interventions in different healthcare settings. By addressing these limitations explicitly and discussing the implications of our findings for clinical practice, we have strengthened the manuscript and provided a more comprehensive understanding of the meta-analysis results.

CONCLUSION

Our study demonstrates that nurse-led comprehensive management of atrial fibrillation significantly improves patients' role-physical and mental health status of SF-36, reduces HADS depression scores, and lowers the risk of cardiovascular hospitalization and atrial fibrillation incidence after 6 months. These findings hold significant clinical

implications. By improving patients' physical and mental health and reducing the incidence of hospitalization and atrial fibrillation, healthcare professionals can optimize patient outcomes and overall well-being. Our results emphasize the crucial role that nurses play in the comprehensive management of atrial fibrillation. The nurse-led approach proves to be effective in achieving these positive outcomes, underscoring the importance of incorporating nurse-led interventions into patient care. Future Implications: This study highlights opportunities to expand or refine nurse-led interventions to better manage atrial fibrillation patients. It also underscores the importance of considering individual patient characteristics and preferences when implementing such interventions. Our findings can inform future studies and clinical guidelines for managing atrial fibrillation. Our research contributes to a growing body of knowledge on atrial fibrillation management. By demonstrating the effectiveness of nurse-led interventions, this study paves the way for developing more comprehensive and patient-centered approaches to managing atrial fibrillation. We acknowledge the limitations of our study, which include heterogeneity in the included studies, potential bias, and variations in study quality. However, we have taken steps to address these issues and remain confident in the overall conclusions of our meta-analysis..

CONFLICT OF INTEREST

The authors have no potential conflicts of interest to report relevant to this article.

AUTHOR CONTRIBUTIONS

KZ, ZF and XC designed the study and performed the experiments, FW and XW collected the data, and analyzed the data, KZ, ZF and XC prepared the manuscript. All authors read and approved the final manuscript. KZ and ZF contributed equally to this work.

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ETHICAL COMPLIANCE

Not applicable.

REFERENCE

1. Lau DH, Linz D, Sanders P. New Findings in Atrial Fibrillation Mechanisms. *Card Electrophysiol Clin*. 2019;11(4):563-571. doi:10.1016/j.ccep.2019.08.007
2. Staerk L, Sherer JA, Ko D, Benjamin EJ, Helm RH. Atrial Fibrillation: Epidemiology, Pathophysiology, and Clinical Outcomes. *Circ Res*. 2017;120(9):1501-1517. doi:10.1161/CIRCRESAHA.117.309732
3. Govindan M, Savelieva I, Catanchin A, Camm AJ. Atrial fibrillation-the final frontier. *J Cardiovasc Pharmacol Ther*. 2010;15(4)(suppl):36S-50S. doi:10.1177/1074248410371947
4. Smigorsky MJ, Norris CM, McMurtry MS, Tsuyuki RT. Measuring the effect of nurse practitioner (NP)-led care on health-related quality of life in adult patients with atrial fibrillation: study protocol for a randomized controlled trial. *Trials*. 2017;18(1):364. doi:10.1186/s13063-017-2111-4
5. Soulat-Dufour L, Lang S, Addetia K, et al. Restoring Sinus Rhythm Reverses Cardiac Remodeling and Reduces Valvular Regurgitation in Patients With Atrial Fibrillation. *J Am Coll Cardiol*. 2022;79(10):951-961. doi:10.1016/j.jacc.2021.12.029
6. Shamseer L, Moher D, Clarke M, et al; Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. *Bmj-Brit Med J*. 2015;350(g7647). doi:10.1136/bmj.g7647
7. Bowyer JL, Tully PJ, Ganesan AN, Chahadi FK, Singleton CB, McGavigan AD. A Randomised Controlled Trial on the Effect of Nurse-Led Educational Intervention at the Time of Catheter Ablation for Atrial Fibrillation on Quality of Life, Symptom Severity and Rehospitalisation. *Heart Lung Circ*. 2017;26(1):73-81. doi:10.1016/j.hlc.2016.04.024
8. Hendriks J, Tomini F, van Asselt T, Crijns H, Vrijhoef H. Cost-effectiveness of a specialized atrial fibrillation clinic vs. usual care in patients with atrial fibrillation. *Europace*. 2013;15(8):1128-1135. doi:10.1093/europace/eut055
9. Yan H, Du YX, Wu FQ, Lu XY, Chen RM, Zhang Y. Effects of nurse-led multidisciplinary team management on cardiovascular hospitalization and quality of life in patients with atrial fibrillation: randomized controlled trial. *Int J Nurs Stud*. 2022;127:104159. doi:10.1016/j.ijnurstu.2021.104159
10. Gallagher C, Orchard J, Nyfort-Hansen K, Sanders P, Neubeck L, Hendriks JM. Nurse led Atrial Fibrillation Management: The NEAT Study: A Randomized Controlled Trial. *J Cardiovasc Nurs*. 2020;35(5):456-467. doi:10.1097/JCN.0000000000000680

11. Hendriks JM, de Wit R, Crijns HJ, et al. Nurse-led care vs. usual care for patients with atrial fibrillation: results of a randomized trial of integrated chronic care vs. routine clinical care in ambulatory patients with atrial fibrillation. *Eur Heart J*. 2012;33(21):2692-2699. doi:10.1093/eurheartj/ehs071
12. Li PW, Yu DS, Yan BP. Nurse-led multi-component behavioral activation program to improve health outcomes in patients with atrial fibrillation: A mixed-methods study and feasibility analysis. *Eur J Cardiovasc Nurs*. 2022; doi:10.1093/eurjcn/zvac104.
13. Wijtliet EPJ, Tieleman RG, van Gelder IC, et al; RACE 4 Investigators. Nurse-led vs. usual-care for atrial fibrillation. *Eur Heart J*. 2020;41(5):634-641. doi:10.1093/eurheartj/ehz666
14. Yan H, Du YX, Wu FQ, Lu XY, Chen RM, Zhang Y. Effects of nurse-led multidisciplinary team management on cardiovascular hospitalization and quality of life in patients with atrial fibrillation: randomized controlled trial. *Int J Nurs Stud*. 2022;127:104159. doi:10.1016/j.ijnurstu.2021.104159
15. Meyer DB, Larkins MC, Taha O, et al. Health care utilization in a nurse practitioner-led atrial fibrillation clinic. *J Am Assoc Nurse Pract*. 2022;34(10):1139-1148. doi:10.1097/JXX.0000000000000779
16. Rochefort CM, Bourgon Labelle J, Farand P. Nurse Staffing Practices and Postoperative Atrial Fibrillation Among Cardiac Surgery Patients: A Multisite Cohort Study. *CJC Open*. 2021;4(1):37-46. doi:10.1016/j.cjco.2021.08.013
17. Rivera-Caravaca JM, Gil-Perez P, Lopez-García C, et al. A nurse-led atrial fibrillation clinic: impact on anticoagulation therapy and clinical outcomes. *Int J Clin Pract*. 2020;74(12):e13634. doi:10.1111/ijcp.13634
18. Piersma FR, Neefs J, Berger WR, et al. Care and referral patterns in a large, dedicated nurse-led atrial fibrillation outpatient clinic. *Neth Heart J*. 2022;30(7-8):370-376. doi:10.1007/s12471-021-01651-x
19. McCabe PJ. Spheres of clinical nurse specialist practice influence evidence-based care for patients with atrial fibrillation. *Clin Nurse Spec*. 2005;19(6):308-317. doi:10.1097/00002800-200511000-00010
20. Li PWC, Yu DSE, Yan BBY. A nurse-coordinated integrated care model to support decision-making and self-care in patients with atrial fibrillation: A study protocol. *J Adv Nurs*. 2019;75(12):3749-3757. doi:10.1111/jan.14164
21. Woo BFY, Tam WWS, Rangpa T, Liao WF, Nathania J, Lim TW. A Nurse-Led Integrated Chronic Care E-Enhanced Atrial Fibrillation (NICE-AF) Clinic in the Community: A Preliminary Evaluation. *Int J Environ Res Public Health*. 2022;19(8):4467. doi:10.3390/ijerph19084467
22. Purkayastha P, Ibrahim A, Haslen D, Gamma R. The efficacy and safety of a nurse-led electrical cardioversion service for atrial fibrillation over a 2-year time period. *Eur J Cardiovasc Nurs*. 2023;22(4):425-429. doi:10.1093/eurjcn/zvac090
23. Rush KL, Burton L, Schaab K, Lukey A. The impact of nurse-led atrial fibrillation clinics on patient and healthcare outcomes: a systematic mixed studies review. *Eur J Cardiovasc Nurs*. 2019;18(7):526-533. doi:10.1177/1474515119845198
24. Lambrinou E, Kalogirou F, Lamnisos D, Sourtzi P. Effectiveness of heart failure management programmes with nurse-led discharge planning in reducing re-admissions: a systematic review and meta-analysis. *Int J Nurs Stud*. 2012;49(5):610-624. doi:10.1016/j.ijnurstu.2011.11.002



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