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# Nonpharmacological Interventions for Preventing Rehospitalization Among Patients with Heart Failure: A Systematic Review and Meta-Analysis

**Nader Alnomasy[1] and Carolyn Harmon Still[2]**

## Abstract

**Background:** Heart failure (HF) is the most common condition for rehospitalization among people aged ≥65 years in the United States, with 35,197,725 hospitalizations between 2014 and 2017. Hospitalized patients with HF have the highest 30-day readmission rate (25%). Overall, HF management, despite its progress, remains a challenge. Although several studies have evaluated interventions designed to reduce HF-related hospital readmissions, research comparing their effectiveness remains insufficient.

**Purpose:** This systematic review and meta-analysis focused on studies that investigated the effectiveness of nonpharmacological interventions (NPIs) on reducing rehospitalization among patients with HF.

**Methods:** This review conformed to the preferred reporting items for systematic reviews and meta-analyses guidelines, used four databases: Cumulative index to Nursing and Allied Health Literature, PubMed, Cochrane, and Web of Science. Studies were included in the review according to the following criteria: (a) included only randomized control trials (RCTs), (b) included participants with HF who were over 18 years of age, (c) peer-reviewed, (d) written in English, and (e) rehospitalizations occurring within 30-day, 90-day, and 1 year of discharge from the initial hospitalization.

**Results:** Fourteen studies were included, with a total of 2,035 participants. Meta-analysis showed that rehospitalization was different between the intervention and usual care groups. The odds ratio was 0.54 (95% confidence interval [0.36, 0.82, $p < 0.01$]).

**Conclusions/Implications for Practice:** NPIs designed to increase HF knowledge and self-management may effectively reduce rehospitalization among HF patients. NPIs can be delivered at the patient's home through visits, phone calls, or digital platforms and technologies.

## Keywords

heart failure, heart failure interventions, nonpharmacological interventions, patient readmission, self-management

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## Introduction

In the United States, heart failure (HF) affects more than 6 million people, with more than 550,000 new cases diagnosed annually (Virani et al., 2021). The risk of developing HF is high among adults over 50 years of age (Benjamin et al., 2019). As the aging of society continues to increase, HF prevalence will also increase (Vespa et al., 2018). The proportion of HF incidence throughout the United States is 2.4%, with prevalence rates of 11, 12.1, and 13% among adults aged 65–69, 70–74, and 75–79 years, respectively (Virani et al., 2021).

As defined by the Center for Medicare and Medicaid Services (CMS, 2020), rehospitalization refers to the admission of an individual to the same or other acute care hospital within a specified period of time from the initial admission.

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Hospitalized patients with HF have the highest 30-day readmission rate (23%; Mathew et al., 2023). HF is the most common condition for rehospitalization among people aged 65 years and older in the United States (Benjamin et al., 2019), with 35,197,725 hospitalizations between 2014 and 2017 (Koser et al., 2018). In 2020, HF accounted for 25% of total hospital readmissions, and 20% of Medicare beneficiaries were readmitted within 30 days of discharge (CMS, 2020).

Despite the significant progress in HF management, it remains a challenge (CMS, 2020). Some evidence-based strategies improve self-care and decrease hospital readmissions among HF patients. Although nonpharmacological interventions (NPIs) have been evaluated to reduce HF-related hospital readmissions, systematic research and meta-analysis comparing the effectiveness among these studies are not well established (Ruppar et al., 2019).

Current HF guidelines recommend primary care practitioners should provide comprehensive education that focuses on self-management (SM) skills and knowledge to patients with HF (Heidenreich et al., 2022). NPIs, including home visits, intensive technology-based monitoring, and inpatient education, are being used to improve patient care and reduce the healthcare burden (Charais et al., 2020). Interventions focused on rehospitalization reduction are necessary to facilitate improved patient and healthcare provider (HCP) outcomes, and health system outcomes for HF (Dai et al., 2023).

## Objectives

Given the need to improve care and reduce hospital readmission, the authors conducted a systematic review (SR) and meta-analysis to evaluate the body of evidence regarding NPIs designed to mitigate HF readmissions. The SR and meta-analysis aimed to assess the efficacy of NPIs on hospital readmissions in patients with HF and to compare their effectiveness with that of standard care.

## Methods

### Identification and Selection of Data Sources

This SR was based on Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021). Articles were searched using the following databases: Cumulative Index to Nursing and Allied Health Literature, PubMed, Cochrane, and Web of Science. The SR was registered in Prospero (ID: CRD42021268675).

### Search Strategy

Studies were searched using the following MeSH terms: "heart failure" OR "cardiac failure" OR "myocardial failure" OR combined "congestive heart failure," "heart failure programs" OR "heart failure intervention," and "patient hospitalization" OR "patient readmission" OR "hospital admission."

### Inclusion and Exclusion

Studies were included in the SR according to the following criteria: (a) RCTs, (b) included participants with HF who were over 18 years of age, (c) peer-reviewed, (d) written in English, and (e) rehospitalizations occurring within 30-day, 90-day, and 1 year of discharge from the initial hospitalizations. Conversely, the authors excluded studies according to these criteria: (a) pharmacological interventions, (b) SR studies, (c) case studies, (d) editorial research reports, (e) opinion research, (f) pharmacological interventions, or (g) protocol papers.

### Data Extraction

Using the Rayyan SR software (Ouzzani et al., 2016), two review authors independently screened the titles and abstracts of all searched studies. Abstracts were then reviewed and coded as "eligible" and "maybe." Unclear or potentially eligible abstracts were further reviewed. Next, the authors retrieved the full text of the studies and identified those that should be included in the paper. The authors also recorded rationale for the studies' ineligibility. The authors identified and excluded duplicate studies and collated multiple reports from the same study. Figure 1 presents the PRISMA flowchart detailing the study's data extraction and selection (Page et al., 2021).

### Data Analysis and Synthesis

The authors used Review Manager version 5.4 for conducting meta-analysis and assessing the heterogeneity of the studies (Review Manager, 2020), and the random effects model for estimating the pooled magnitude. The random effects model allows studies to have their own effect sizes, assuming the sample size difference is caused by the sampling error and not by the effect sizes (Deeks et al., 2021). The degree of heterogeneity was assessed using the Cochrane's Q statistic and the $I^2$ threshold values of 25%, 50%, and 75% to indicate low, moderate, or high levels of heterogeneity. A 2-tailed $p$ 0.05 was regarded as a statistically significant indicator (Deeks et al., 2021).

### Assessment of Risk Bias in Included Studies

In each study, the risks of bias, which were independently assessed by two review authors, were evaluated using the criteria outlined in the *Cochrane Handbook for Systematic Reviews* (Higgins et al., 2021). The authors identified the following four domains where bias could occur: random sequence generation, allocation concealment, blinding of

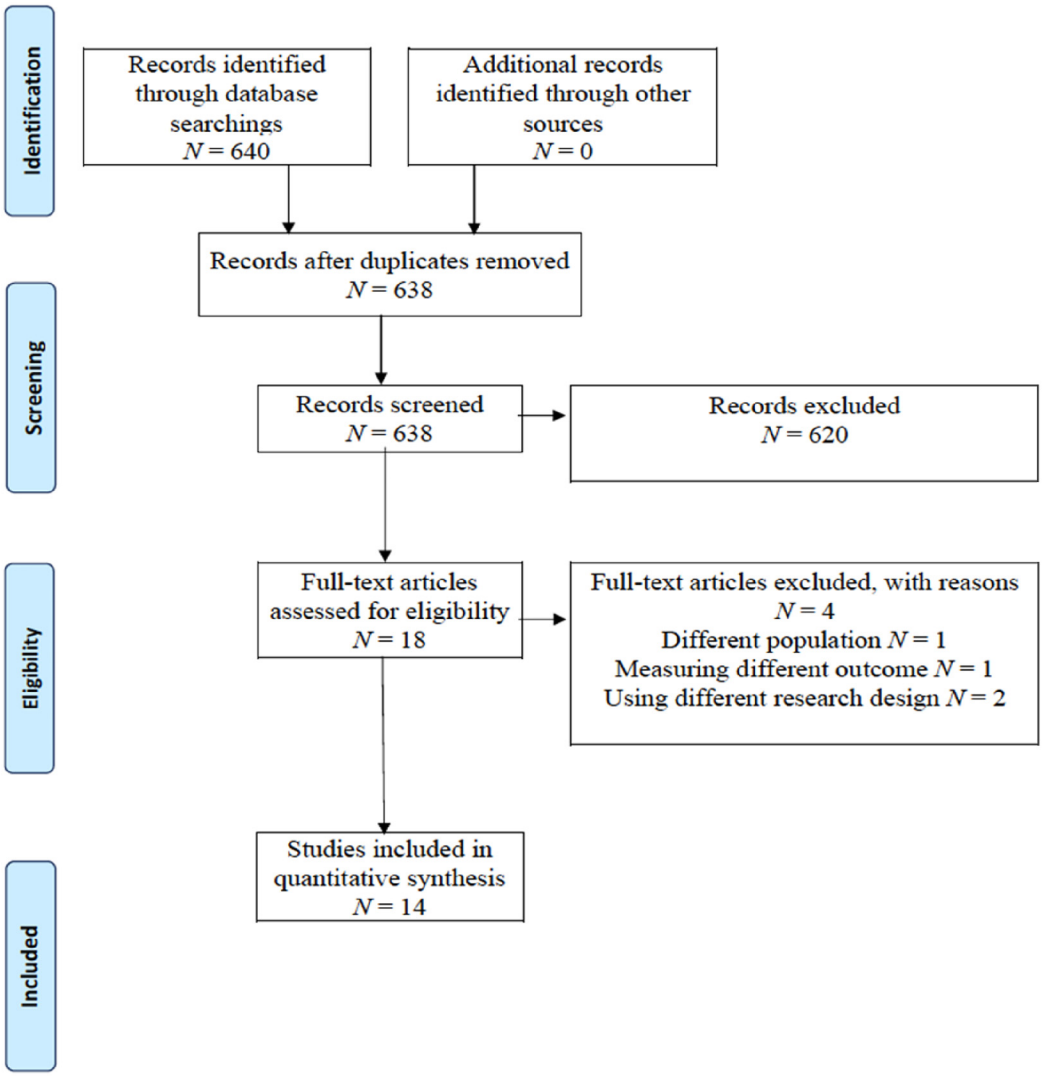


**Figure 1.** PRISMA flowchart.

participants, and incomplete outcome data biases (Higgins et al., 2021). The authors rated the potential sources of bias for each study as high, low, or unclear according to the criteria and then justified their judgment for each domain.

## Results

### *Description of Studies*

Out of 640 records found, two were removed because of duplication, thereby leaving 638 unique publications. After the studies were screened by title and abstract, 620 were excluded; 18 studies were left for full-text screening. During the screening process, four articles were excluded. Ultimately, the authors included 14 full-text studies. Table 1 lists the peer-reviewed studies of NPIs in comparison with those of usual care (UC). Most studies were conducted in the US ($n = 5$), followed by China ($n = 4$). Others originated from Australia, Taiwan, Vietnam, Japan, and Turkey ($n = 1$ each). These studies were mostly two-group RCTs. The duration of intervention and the frequency of follow-up (FU) varied among these studies. The duration of intervention was 12 months in five studies (Boyde et al., 2018; Breathett et al., 2018; Chen et al., 2020; Cui et al., 2019; Mizukawa et al., 2019), 6 months in four studies (Chen et al., 2018; Chen et al., 2019; Sezgin et al., 2017; Wang et al., 2014), 1 month in three studies (Davis et al., 2012; Leavitt et al., 2020; Sales et al., 2013), 4 months in one study (Young et al., 2016), and 2 weeks in one study (Dinh et al., 2019).

### *Types of Interventions*

The interventions in the included studies were classified into the following four types: (a) multimedia educational, (b)

**Table 1.** Characteristics of the Included Studies.

| Author/year country | Goal | Design | Sample | Mean age | Gender men (%) | Outcomes |
|---|---|---|---|---|---|---|
| Boyde et al. (2018) Australia | To evaluate the effectiveness of an educational intervention designed to reduce hospital readmissions among patients with HF | RCT | Intervention = 100 Control = 100 | Intervention = 64 Control = 64 | Intervention = 77 Control = 69 | Unplanned hospital readmissions at 28 days, 3 months, and 12 months after recruitment |
| Breathett et al. (2018) USA | To examine the effectiveness of a novel tablet application that uses conditional logic to evaluate patient responses to nurse practitioner education at reducing 30 days of readmission | RCT | Intervention = 60 Control = 66 | Intervention = 61.1 Control = 60.2 | Intervention = 73.6 Control = 63.3 | 30 days of readmission |
| Chen et al. (2019) China | To examine the effectiveness of postdischarge phone-based interventions on clinical outcomes and self-care behavior in patients with HF | RCT | SMS group ($n$ = 252) STS group ($n$ = 255) UC ($n$ = 260) | SMS group = 60 STS group = 62 UC group = 61 | SMS group = 57.5 STS group = 54.5 UC group = 57.3 | Hospitalization in patients with HF at 180-day follow-up |
| Chen et al. (2020) Taiwan | To examine the effects of a predischarge educational program with a one-year postdischarge follow-up on self-care behaviors, depression, readmission, and sleep quality in patients with HF | Pretest–posttest | Intervention = 25 Control = 22 | Intervention = 56.4 Control = 58.2 | Intervention = 75 Control = 52.9 | Readmission at one-year |
| Chen et al. (2018) China | To determine if a multidisciplinary disease management program improves the quality of life, physical performance, depressive symptoms, self-care behaviors, and mortality or rehospitalization in patients with HF in China | RCT | Intervention = 31 Control = 62.4 | Control = 62.4 Intervention = 61.1 | Intervention = 71 Control = 48.4 | Rehospitalization within 180-day of follow-up |
| Cui et al. (2019) China | To examine the effects of a structured nurse-led educational program on patient SM and hospital readmission | RCT | Intervention = 48 Control = 48 | Intervention = 55.1 Control = 56.6 | Control = 68.8 Intervention = 72.9 | Readmission within 12 months of discharge |
| Davis et al. (2012) USA | To evaluate the effectiveness of a customized educational intervention for patients with mild to moderate on HF knowledge, self-care behavior, and readmission rates | RCT | Intervention = 63 Control = 62 | Intervention = 60 Control = 57 | Intervention = 49 Control = 56 | 30-day readmission rate |
| Dinh et al. (2019) Vietnam | To examine the effectiveness of a nurse-led intervention using the teach-back method to teach self-care to adults with HF | RCT | Intervention = 70 Control = 70 | Intervention = 52.9 Control = 55.9 | Intervention = 60 Control = 47.1 | Hospitalization within three months of postdischarge |
| Leavitt et al. (2020) USA | To examine the impact of the CareNavRN intervention on hospital readmissions, self-care, HF knowledge, and quality of life in older adults with HF | RCT | Intervention = 19 Control = 21 | Intervention = 82.7 | Intervention = 52.6 Control = 52.4 | 30-day readmission |
| Mizukawa et al. (2019) Japan | To compare the effectiveness of CM and SM with (UC) in improving psychosocial status and their effectiveness in reducing rehospitalization and all-cause mortality within 24 months | RCT | UC = 19 CM = 20 SM = 20 | Intervention = 71.6 | Intervention = 62.7 | Hospitalization within 12 months of follow-up |

(continued)

**Table 1.** Continued.

| Author/year country | Goal | Design | Sample | Mean age | Gender men (%) | Outcomes |
|---|---|---|---|---|---|---|
| Sales et al. (2013) USA | To examine whether formally trained volunteers providing ancillary services can reduce readmissions for patients with HF | RCT | Intervention = 70 Control = 67 | Intervention = 72.5 Control = 72.6 | Intervention = 37.1 Control = 47.8 | 30-day HF readmission |
| Sezgin et al. (2017) Turkey | To examine the effect of a nursing care and follow-up program on self-care, quality of life, and hospitalization for patients with HF | RCT | Intervention = 45 Control = 45 | Intervention = 60.75 Control = 65.8 | Intervention = 84 Control = 69 | Rehospitalization within 3–6 months |
| Wang et al. (2014) China | To compare the WM intervention with UC among Chinese individuals with HF | RCT | Intervention = 32 Control = 34 | Intervention = 66.16 Control = 69.72 | Control = 61.76 Treatment = 75 | HF-related rehospitalization after the 6-month WM intervention |
| Young et al. (2016) USA | To evaluate the effects of the patient activation intervention on hospital readmission and emergency department visit rates at 30 days, 3 months, and 6 months | RCT | Intervention = 51 Control = 49 | Intervention = 68.7 Control = 71.8 | Intervention = 47.1 Control = 24.5 | Readmissions within 30, 90 and 180 days of follow-up |

RCT = randomized control trial, SMS = short message service, STS = structure telephone support, UC = usual care, HF = heart failure, CM = collaborative management, SM = self-management, WM = weight management.

phone-based, (c) education-based self-care, and (d) pre-/post-discharge education for follow-up (see Table 2).

## *Effect of Interventions on Hospital Readmissions*

*Multimedia Educational Intervention.* Two studies (Boyde et al., 2018; Breathett et al., 2018) implemented a multimedia educational intervention designed to reduce readmission. In Boyde et al.'s (2018) study, the intervention significantly reduced the risk of readmission for 12 months following readmission; the intervention group had a 30% lower risk of hospital readmission than the control group. Similarly, Breathett et al. (2018) implemented a tablet application, which applied personalized conditional logic and alerts health care staff to patient responses, to mitigate readmission of patients with HF within 30 days. The intervention group had lower all-cause readmission rates at 30 days than the control group (13.2% vs. 26.7%, $p = 0.08$); the difference was not significant.

*Phone-Based Intervention.* Chen et al. (2019) implemented and evaluated phone-based interventions such as short message service (SMS) and structure telephone support (STS) designed to improve all-cause hospitalization at the 180-day FU. The SMS group received short messages that explained the symptoms of HF decompensation; the STS group received one structured phone call from research nurses within 30 days after discharge. Results showed that SMS and STS significantly reduced all-cause readmission in 180 days of FU.

*Education-Based Self-Care Intervention.* Six studies (Cui et al., 2019; Davis et al., 2012; Dinh et al., 2019; Leavitt et al., 2020; Mizukawa et al., 2019; Wang et al., 2014) evaluated an SM-intervention through education. Cui et al. (2019) determined the effect of a nurse-led education program on patient SM and hospital readmissions in rural Chinese patients with HF. Davis et al. (2012) examined the impact of a tailored educational intervention designed for patients with mild cognitive impairment (MCI) on 30-day hospital readmission. The readmission rates within the 30-day study period were not significantly different between the intervention and control groups. The intervention was associated with a reduction in hospital readmission caused by cardiac causes within the first 12 months of discharge. Dinh et al. (2019) also investigated the efficacy of a nurse-led intervention that used the teach-back method to teach self-care to adults with HF. However, hospitalization showed no significant differences between the groups 3 months after discharge (relative risk [RR] = 0.98, 95% confidence interval [CI] [0.57, 1.68], $p = 0.95$). Leavitt et al. (2020) used a home health nurse education intervention to improve self-care and lower hospital readmission rates in people with HF. This study revealed that six (29%) patients in the control group and only three (16%) patients in the intervention group were readmitted within 30 days, although the results were underpowered and nonsignificant. In Mizukawa et al.'s (2019) study, an SM education intervention was implemented within 24 months; 24 patients with recurrent HF were rehospitalized. Most of these patients belonged to the UC group (57%), followed by the SM group (27%). The event-free survival curves indicated that the HF-related hospitalization rate

**Table 2.** Characteristics of the Types of Interventions in the Included Studies.

| Author and year | Intervention | Follow-up | Findings |
|---|---|---|---|
| Breathett et al. (2018) | Multimedia educational intervention | 12 months | The 30-day readmission rate was lower in the intervention group than in the control group, the results were not statistically significant |
| Boyde et al. (2018) | Multimedia educational intervention | 12 months | The multimedia educational intervention reduced the risk of readmission at 12 months by 30% (OR = .407, 95% CI [0.216–0.766]) |
| Chen et al. (2019) | Phone-based intervention | 6 months | The primary endpoint was the 180-day composite event. The 30-day readmission showed no difference between the intervention groups and the control group. The 180-day readmission rate decreased in the SMS and STS groups compared with that in the UC group |
| Chen et al. (2020) | Pre-/postdischarge education intervention for FU | 12 months | The Cox proportional hazards model revealed that the intervention group had fewer first readmissions (53%) than the control group (47%) after adjustment for the New York Heart Association functional group classification and left ventricle ejection fraction. The model focusing on the time to first three readmissions showed that the intervention group had fewer first three events than the control group. The intervention group also did not require more than two readmissions in a year |
| Chen et al., 2018 | Pre-/postdischarge education intervention for follow-up | 6 months | The readmission rates were not different between the intervention and control groups within the 180-day FU period |
| Cui et al. (2019) | Education-based self-care intervention | 12 months | The intervention was associated with a reduction in hospital readmission caused by cardiac causes within the first 12 months of discharge |
| Davis et al. (2012) | Education-based self-care intervention | 30 days | The readmission rates, days to first readmission, and total hospital days within the 30-day study period were not significantly different between the intervention and control groups |
| Leavitt et al. (2020) | Education-based self-care intervention | 30 days | Six (29%) patients in the control group and only three (16%) patients in the intervention group were readmitted within 30 days, although the results were underpowered and nonsignificant |
| Mizukawa et al. (2019) | Education-based self-care intervention | 12 months | Within 24 months, 24 patients with recurrent HF were rehospitalized. Majority were in the UC group (57%), followed by the SM group (27%). The event-free survival curves indicated that the HF-related hospitalization rate was significantly different between the two groups ($p = 0.048$) |
| Sales et al. (2013) | Pre-/postdischarge education intervention for follow-up | 30 days | At 30-day follow-up, the rate of readmission caused by acute exacerbation of HF was lower in the intervention group than in the UC group (7% vs. 19%) |
| Sezgin et al. (2017) | Pre-/postdischarge education intervention for FU | 1 month | When comparing the baseline with the third month, the hospitalization status of the intervention group showed significant differences compared with that of the control group |
| Wang et al. (2014) | Education-based self-care intervention | 6 months | During the 6 months following the intervention, the HF-related rehospitalization rate was significantly lower in the intervention group than in the control group |
| Young et al. (2016) | Pre-/postdischarge education intervention for FU | 4 months | The readmission rates were not different between the intervention and control groups at 12 weeks of FU |

significantly differed between the SM and UC groups ($p = 0.048$). Wang et al. (2014) examined whether weight management (WM) intervention could reduce HF-related readmission. Before discharge, the intervention group was given a weight management booklet and a weight diary. Within 6 months following the intervention, the rehospitalization rate for HF was significantly lower in the intervention group than in the control group.

*Pre-/Postdischarge Education Intervention for Follow-up.* Five studies (Chen et al., 2020; Chen et al., 2018; Sales et al., 2013; Sezgin et al., 2017; Young et al., 2016) implemented a pre-/postdischarge education intervention for the FU program of patients with HF to mitigate readmissions. Chen et al. (2020) investigated whether a predischarge educational program combined with a one-year postdischarge FU reduced readmission in patients living with HF. At 12 months after hospital discharge, the intervention group had fewer hospital readmissions than the control group, but not significant. According to Sales et al. (2013) and Sezgin et al. (2017), those who received pre-/postdischarge education intervention were less likely to be readmitted than those who did not. However, Chen et al. (2018) and Young et al. (2016) discovered that the readmission rates between

intervention and control groups were not significantly different.

### Meta-Analysis Results

In this meta-analysis, the authors evaluated the outcomes from 14 studies encompassing a total of 2,035 patients. These studies provided data on rehospitalization rates, an essential measure of the quality of care for patients living with HF. The results indicated a significant difference in rehospitalization rates between the groups receiving NPIs and those receiving UC. Patients who received NPIs had 46% lower odds of rehospitalization compared to those receiving UC, with an odds ratio of 0.54 (95% CI [0.36, 0.82]). This difference was statistically significant, as evidenced by a $p$-value less than 0.01. However, there was a moderate degree of heterogeneity across the studies, as indicated by an $I^2$ statistic of 61%. The $I^2$ statistic assesses magnitude and direction of effect sizes across studies, with higher values indicating considerable heterogeneity. The $I^2$ statistic shows the percentage of studies that have significant heterogeneity (see Figure 2).

*Allocation.* The authors rated the studies according to the Cochrane criteria and found no high risk of selection bias. However, three studies did not report methods of sequence generation and randomization (Davis et al., 2012; Sales et al., 2013; Wang et al., 2014). Four studies used computer-generated sequences (Boyde et al., 2018; Breathett et al., 2018; Chen et al., 2018; Cui et al., 2019). Seven studies did not clearly report the allocation concealment (Breathett et al., 2018; Chen et al., 2020; Chen et al., 2018; Davis et al., 2012; Leavitt et al., 2020; Sales et al., 2013; Sezgin et al., 2017).

*Blinding.* Blinding in a trial refers to whether participants and researchers are aware of the specific intervention each participant is receiving (Higgins et al., 2021). The risk of blindness bias was unclear in six studies related to the lack of details regarding participant blinding (Boyde et al., 2018; Breathett et al., 2018; Davis et al., 2012; Mizukawa et al., 2019; Sezgin et al., 2017; Wang et al., 2014). Only three studies reported that the primary researcher was blinded (Chen et al., 2018; Cui et al., 2019; Davis et al., 2012).

*Incomplete Outcome Data.* One study had a high risk of bias related to a high attrition rate at over 20% (Mizukawa et al., 2019). The authors evaluated one study for the unclear risk of bias in reporting outcomes (Sales et al., 2013). The remaining studies were at a low risk of bias.

*Selective Reporting Bias.* The authors rated the published studies as having a low risk of being biased for selective reporting owing to the availability of the study outcomes and all the study results. See Figure 3 for risk of bias details.

## Discussion

This SR and meta-analysis sought to assess the effect of NPIs on hospital readmissions in persons with HF and to compare their effectiveness with that of UC. Fourteen studies with a total of 2,035 participants were included. This meta-analysis highlighted the importance of NPIs on reducing rehospitalization risk among persons with HF. Most of the reviewed NPIs successfully reduced hospital readmission in persons living with HF. However, the degree to which the interventions were successful depended on the type and duration of the interventions. This SR covered four main intervention types, namely, (a) multimedia educational, (b) phone-based, (c) education-based self-care, and (d) pre-/postdischarge education for FU. The duration of interventions ranged from 2 weeks (Dinh et al., 2019) to 12 months (Boyde et al., 2018; Breathett et al., 2018; Chen et al., 2020; Cui et al.,

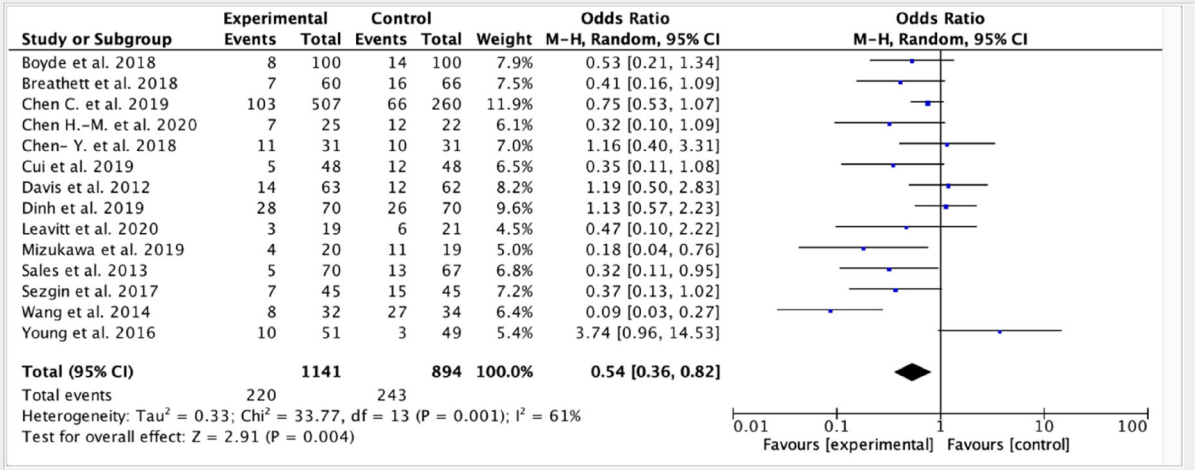


**Figure 2.** Forest plot for hospitalization results.

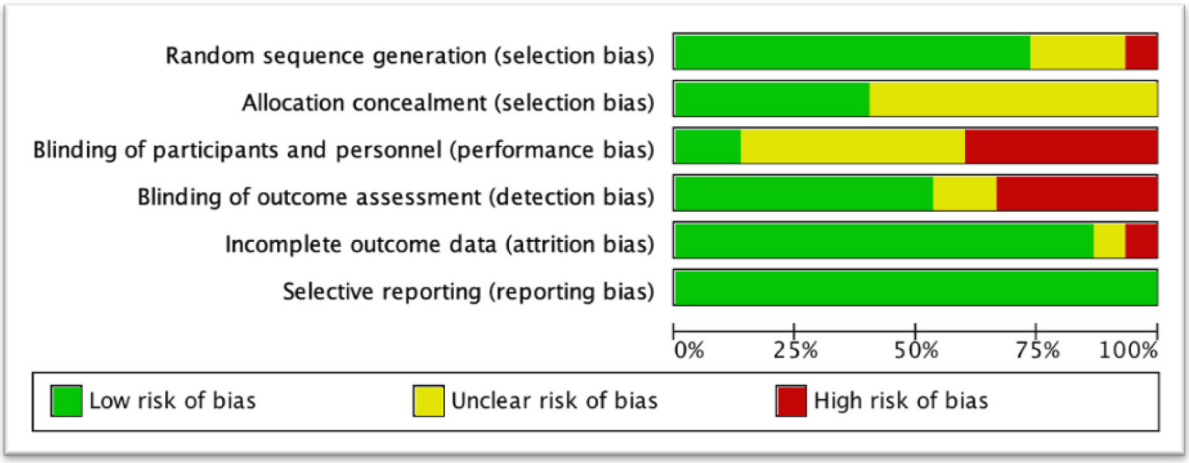


**Figure 3.** Risk of bias graph.

2019; Mizukawa et al., 2019). Although the intervention types were varied, the components of these interventions were similar in that most interventions included education-based intervention about HF, medication, diet, and exercise advice, as well as self-care skills.

The results of this review emphasized the importance of HF management programs and have important implications for nurses as key coordinators to HF SM. This viewpoint is consistent with Riley and Masters' (2016) study that highlighted the importance of developing multidisciplinary interventions for rehospitalized patients. A multidisciplinary intervention involves a team of experts such as a nurse, a physician, a social worker, and a pharmacist. Hospitalizations for patients with HF can be substantially reduced by delivering postdischarge interventions focusing on education and SM (DeVore et al., 2021).

### *Limitations*

Although this SR and meta-analysis explained the effectiveness of using NPIs to mitigate HF readmissions, it has a few limitations that need to be acknowledged. First, the studies included in this review have small sample sizes. Considering the small sample size for all intervention groups, significant benefits may not be detected. Second, the significance and effect sizes varied significantly across studies, thereby influencing the efficacy of the interventions. This concept can be explained by the many factors that may reduce the quality of evidence; these factors include the high risk of bias and the lack of consistency reported between studies. Additionally, some studies presented multicomponent interventions; thus, the efficacy of specific components of the intervention can be difficult to determine. Third, the inconsistency in point estimates between studies revealed the lack of generalizability because most studies excluded patients diagnosed with New York Heart Association Stage IV.

Although the included studies provided broad inclusion criteria, they limited the participants to persons living with HF without significant comorbidities, terminal diseases, cognitive impairment, or those in long-term care facilities. One study (Davis et al., 2012) included patients with MCI. Thus, the benefit of the intervention may not be extended to those excluded groups. This review included studies from both Western and non-Western countries. The findings may be applicable to multiple diversities; however, the issues raised by these studies still need to be investigated. Future studies should aim to measure the impact of interventions on various health aspects including self-efficacy, patient acceptance of the intervention, and medication adherence.

## Implications for Practice

HF presents complex challenges for health care, and further research on the aging population is necessary to improve patients' health care and HF-related outcomes. Evidence supports the need for treatment tailoring, which should be accompanied by clear communication coupled with education and nurse-led interventions to reduce rehospitalization rates.

## Conclusions

In conclusion, interventions designed to increase HF knowledge and SM may effectively reduce rehospitalization among patients with HF. These interventions can be delivered at the person's home through visits, phone calls, or digital platforms and technologies. Regarding the implications of this SR for nursing practice, it helps elucidate intervention strategies and components that are effective in reducing rehospitalization in patients with HF.

### Authors' Contribution

Study conception and design by NA, CHS. Data collection by NA, CHS. Data analysis and interpretation by NA. Drafting of the article by NA, CHS. Critical revision of the article by NA.

## Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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