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The Impact of Nurse-Led Interventions on Improving Self-Management and Quality of Life for Patients with Heart Failure

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Abstract

According to the American Heart Association, over 5 million Americans suffer from heart failure, and an additional 500,000 are diagnosed with the condition every year. It's crucial that you comprehend the nature of the illness and your possibilities for treatment because of this. We provide you the inside scoop so you can give this expanding patient population the finest treatment possible.

According to National Institutions of Health, It is anticipated that the number of fatalities in India from CVD will increase from 2.26 million in 1990 to 4.77 million in 2020. According to estimates throughout the past few decades, the prevalence of coronary heart disease in India has varied between 1.6% and 7.4% in rural areas and between 1% and 13.2% in urban areas.

Heart failure remains the most common cause of hospitalization for adults over 65, making it a serious public health concern in the US. Regretfully, there isn't much hope for this illness: within four years, 50% of heart failure sufferers will pass away from the condition. Heart failure claims the lives of over 287,000 individuals annually, and 40% of patients who are hospitalized for the illness either pass away or return within a year. Not to add that in 2006, the anticipated yearly cost of treating heart failure was $29.6 billion.

In this paper, we will discuss through the pathophysiology, causes, and symptoms of heart failure in this post. I'll also cover key diagnostic resources, available treatments, and patient education techniques to assist your patient take care of his condition.

Keywords: health outcomes, heart failure, meta-analysis, nurse, self-care intervention.

1. Introduction

Patient-centered care is the foundation of nurse-led self-management programs, which are designed to help patients better understand their conditions and provide them the tools they need to make decisions about their own health.6, 7 These programs frequently include instruction on how to identify symptoms, follow prescription instructions, reduce risk factors, and alter one's lifestyle.4,8 Given their distinct role at the nexus of clinical knowledge and patient advocacy, nurses are highly qualified to assist patients in navigating the challenges associated with CVD self-management (Central illustration). The foundation of successful self-management is education. By converting difficult ideas into facts that patients can use, nurses may help patients understand medical language. Through enhancing patients' understanding of CVD risk factors, disease development, and available treatment options, nurses empower patients to

make lifestyle decisions that support cardiovascular health.9. By this kind of instruction, patients are able to actively participate in joint decision-making with medical professionals.

Globally, heart failure is the primary cause of illness and mortality. Heart failure was predicted to become more common by 46% and to cost USD 69.7 billion (or 127% of GDP) by 2030. (Mozaffarian et al., 2016; Heidenreich et al., 2013) Heart failure is the most prevalent cardiac cause for hospitalization in Singapore, accounting for 18% of all cardiac admissions and affecting about 4.5% of Singaporeans. (Reuter and others, 2010) Heart failure self-care is one tactic that could lessen the healthcare burden associated with the condition. A six-month economic research revealed that patients with heart failure who participated in a heart failure self-care program experienced a significant reduction in their mean length of hospitalization (3 against 7.3 days) and health resource use ($9065 versus $16,712). Nonetheless, the global adherence rate to heart failure self-care is still below 50%, despite a variety of educational and counseling initiatives. (Murray and Mullan, 2019; Hall and Fong, 2015)

The term "heart failure self-care" describes a series of routinely carried out actions intended to preserve physiological stability, keep an eye out for heart failure symptoms, and control symptom exacerbations. (Elliston and others, 2017) It can be difficult to incorporate maintenance behaviors like sodium restriction, consistent exercise, and daily weight monitoring into one's lifestyle because they demand ongoing self-control and offer few, if any, short-term benefits (such as the absence of symptoms). (Liddelow et al., 2020; Elliston et al., 2017) This clarifies the intention-behavior gap, which occurs when patients say they want to change but are unable to do so through their actions. (Reuter and others, 2010)

The Temporal Self-Regulation Theory (Fig. 1) states that self-regulation ability, behavioral prepotency, and time perspective all have an impact on behavior, which means that actions are not always purposeful and rational. (Fong and Hall, 2007) In a nutshell, self-regulation capacity refers to the cognitive ability to monitor and control thoughts, emotions, and behaviors; time perspective refers to the degree to which one considers the future consequences of current behaviors; and behavior prepotency refers to behavioral automaticity (akin to habits). (Fong and Hall, 2007) The intention-behavior relationship for a number of health-related behaviors, such as increasing physical activity, binge drinking, snacking, medication adherence, and hall and fong (2015), Murray and Mullan (2019), and Elliston et al. (2017), has been explained by this hypothesis. Liddelow and colleagues, 2020). Heart failure self-care is believed to be significantly improved by a self-regulation intervention based on the Temporal Self-Regulation Theory, as it involves similar health behaviors such as daily body weight, regular physical activity, dietary restriction of sodium, and medication adherence. To the best of the authors' knowledge, however, no such research exist. In order to improve heart failure self-care, future-thinking, and behavioral automaticity, this study set out to create a self-regulation program and evaluate its efficacy.

By recreating one's own general or outcome-specific future events, episodic future thinking is an approach that has gained popularity to improve future-thinking and influence decision-making. (Schacter and others, 2017) It has been demonstrated that periodic future-thinking significantly enhances healthy decision-making for alcohol intake (Snider et al., 2016), cigarette usage, and food habits (Dassen et al., 2016). (Stein and others, 2018) But robust biological brain networks mean that automatic behaviors, like habits, are hard to break and need active top-down cognitive regulatory control. Gawande and colleagues, 2019) Therefore, in order to overcome these instinctive reactions, self-regulation skills are typically required. These abilities involve goal-setting, action planning, coping planning, and the identification and correction of harmful behaviors.

2. Methods

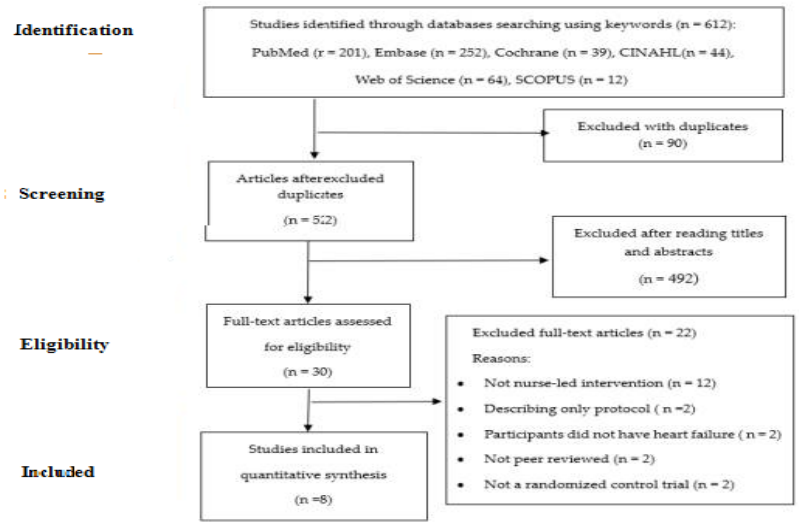
2.1 Search Strategies

We created research questions using the PICO format for systematic review [20] and followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [19]: Is hospital-based, nurse-led heart failure self-care education (Intervention) better for the health outcomes (Outcomes) of the intervention group than the control group (Comparison) in randomized controlled trials (RCTs) (Type of studies) for heart failure patients (Participants)? Prior to starting this systematic review, we looked up any previous or ongoing reviews in the International Prospective Register of Systematic Reviews and the Joanna Briggs Institute Cochrane Library. To minimize potential sources of bias when evaluating the efficacy of nurse-led heart failure self-care education, we limited the scope of our review to randomized controlled trials. A comprehensive search of six databases was carried out in order to verify all pertinent publications published between January 2000 and October 2019: PubMed, EMBASE, Cochrane library, CINAHL, Web of Science, and SCOPUS. (heart failure, cardiac failure, congestive heart failure, heart decomposition, or myocardial failure) AND (self-care, self-care behavior, self-management, or self-care behavior) AND (nurse-led, or nursing-led) were the search terms that were used, based on Medical Subject Heading (MeSH) terms and keywords. By looking through the references lists of the papers that had already been found, more studies were found in table 1.

2.2 Study Selection

Studies that met the following criteria were included in this review: (1) original articles on RCTs that tested interventions on heart failure self-care or self-management that are created and/or provided by nurses; (2) published in English; and (3) consisting of patients who are 18 years of age or older and undergoing treatment for a heart failure diagnosis. The following were excluded: (1) research with no results; (2) studies without peer reviews; and (3) editorials, observational studies, letters, conference abstracts, and reviews.

In terms of health outcomes, patient-reported quality of life and knowledge of heart failure were considered secondary outcomes, while all-cause death, heart failure specific readmission, and readmission for any reason were the major outcomes. Two reviewers (YJS and HJL) separately chose pertinent publications by looking through the titles and abstracts they had retrieved in order to assure dependability. Discussion was used to settle any disagreements. In the end, eight RCTs were found and added to the study. Figure 1 depicts both the entire procedure and the reasons for exclusion.



2.3. Data Extraction

Data were extracted from each study using a data extraction sheet that was arranged by the last name of the first author, the year of publication, the study location, the patient characteristics (e.g., sample size, mean age, percentage of males and females, and severity of heart failure), the start and length of the intervention, the details of the intervention group, the details of the control group, outcome variables, and main findings. The data extraction was carried out separately by two writers (YJS and HJL), with any disagreements resolved by the third author (JYC).

Table 1

Description of studies included (N=8)

Authors (Publication Year)/Location	Participants		Time of Initiation	Duration of Intervention Delivery	Follow-Up Period	Intervention	Outcome Variables	Main Findings
	Intervention Group	Control Group						
Krumholz et al. (2002)/USA [24]	*N* = 44 Mean age: 75.9 yr M: 48%, F: 52% NYHA: unreported Mean LVEF: 38.0%	*N* = 44 Mean age: 71.6 yr M: 66%, F: 34% NYHA: unreported Mean LVEF: 37.0%	Prior to discharge	12 months	12 months	·Intervention: Cardiac nurse reviewed (once/1 h) patient's knowledge of heart failure in one to one and used phone call (17 times) to support heart failure care and management. ·Control: Not detail reported.	All-cause mortality or readmission, heart failure mortality or readmission, costs	Intervention group had significantly lower on all-cause mortality or hospital readmission (p = 0.01), heart failure mortality or readmission (p = 0.01), costs (p = 0.02)
Koelling et al. (2005)/USA [25]	*N* = 107 Mean age: 65 yr	*N* = 116 Mean age: 64 yr M: 58%, F:	Prior to discharge	1 day	6 months	·Intervention: Nurse educator discussed	All-cause mortality or	Intervention group had

Authors (Publication Year)/Location	Participants		Time of Initiation	Duration of Intervention Delivery	Follow-Up Period	Intervention	Outcome Variables	Main Findings
	Intervention Group	Control Group						
	M: 58%, F: 42% NYHA: unknown n Mean LVEF: 26%	42% NYHA: unknown Mean LVEF: 27%				(once/1 h) heart failure-specific information that covered the basic principles of the causes of heart failure and rationale for pharmaceutical therapies. ·Control: Received standard written discharge information.	readmission, all-cause mortality, heart failure specific readmission, cost	significantly lower on all-cause mortality or readmission (p = 0.018), heart failure specific readmission (p = 0.015), cost (p = 0.035); No significant difference in all-cause mortality, QoL
Aldamiz-Echevarría Iraúrgui et al. (2007)/Spain [26]	N = 137 Mean age: 75 yr M: 39%, F: 61% NYHA: unreported Mean LVEF: 50.9%	N = 142 Mean age: 76 yr M: 40%, F: 60% NYHA: unreported Mean LVEF: 48.3%	Within 15 days after hospital discharge	15 days	12 months	·Intervention: Nurse visited home 3 times (1 h) after discharge to administer the education program, teaching patient and	All-cause mortality or readmission, all-cause mortality, all-cause readmission	No significant difference in all-cause mortality or readmission, all-cause mortality

Authors (Publication Year)/Location	Participants		Time of Initiation	Duration of Intervention Delivery	Follow-Up Period	Intervention	Outcome Variables	Main Findings
	Intervention Group	Control Group						
						relatives basic facts about heart failure and its management (symptoms, lifestyle, diet, therapy) ·Control: Not detail reported.		, all-cause readmission
Kommuri et al. (2012)/USA [27]	*N* = 128 Mean age: 66 yr M: 61%, F: 39% NYHA: unknown Mean LVEF: 25%	*N* = 137 Mean age: 67 yr M: 61%, F: 39% NYHA: unknown Mean LVEF: 26.5%	Prior to discharge	1 day	3 months	·Intervention: Nurse educated (once/1 h) the basic principles of heart failure, role of dietary sodium, importance of limitation of fluid intake, the mechanisms of diuretics, and the rationale for other pharmacotherapy. ·Control: Received standard	Heart failure knowledge	Intervention group had significantly higher on heart failure knowledge (p = 0.007).

Authors (Publication Year)/Location	Participants		Time of Initiation	Duration of Intervention Delivery	Follow-Up Period	Intervention	Outcome Variables	Main Findings
	Intervention Group	Control Group						
						discharge information.		
Cockayne et al.(2014) /UK [28]	*N* = 95 Mean age: 70 yr M: 73%, F: 27% NYHA: I-II= 73%, III-IV= 27%, Mean LVEF: unreported	*N* = 165 Mean age: 70 yr M: 72%, F: 28% NYHA: I-II= 66%, III-IV= 34%, Mean LVEF: unreported	After discharge	12 months	12 months	·Intervention: Specialist heart failure nurse provided (up to 6 times) self-management program (The heart plan) and accompanying DVD, relaxation tape, exercises, regular monitoring of symptoms, blood tests, clinical assessments, referrals.·Control: Given the same self-management manual.	All-cause readmission, QoL	No significant difference in all-cause readmission, QoL
de Souza et al.(2014)/ Brazil [29]	*N* = 123 Mean age: 62 yr M: 61 %, F:	*N* = 129 Mean age: 62 yr M: 64%, F: 36% NYHA:	Within 10 days after hospital discharge	4 months	6 months	·Intervention: Nurses provided a heart failure-focused physical	All-cause mortality, all-cause readmiss	Intervention group had significantly

Authors (Publication Year)/Location	Participants		Time of Initiation	Duration of Intervention Delivery	Follow-Up Period	Intervention	Outcome Variables	Main Findings
	Intervention Group	Control Group						
	39% NYHA: I-II= 46%, III-IV= 54%, Mean LVEF: 29%	I-II= 42%, III-IV= 58%, Mean LVEF: 30%				examination (Clinical Congestion Score, blood pressure, jugular venous pressure) through a home visits (4 times/~60 min). Phone calls (4 times/~10 min) were used to reinforce recommendations given during home visits, check the use of prescribed medications. ·Control: Received instructions regarding pharmacological and non-pharmacological therapeutic strategies.	ion, heart failure specific readmission & ED visits, heart failure knowledge	higher on heart failure knowledge ($p < 0.001$); No significant difference in all-cause mortality, all-cause readmission, heart failure specific readmission & ED visits
Boyde et al. (2018)/	*N* = 100 Mean age: 64	*N* = 100 Mean age: 64 yr	Unreported	1 day	12 months	·Intervention: Patients watched the	All-cause readmiss	Intervention group

Authors (Publication Year)/Location	Participants		Time of Initiation	Duration of Intervention Delivery	Follow-Up Period	Intervention	Outcome Variables	Main Findings
	Intervention Group	Control Group						
Australia [30]	yr M: 77%, F: 23% NYHA: I-II= 35%, III-IV= 65%, LVEF: <36%: 75%	M: 69%, F: 31% NYHA: I-II= 31%, III-IV= 69%, LVEF: <36%: 83%				DVD for 30 min on the role model of self-care behaviors and participated in a one to one discussion with a specialist heart failure nurse (once/60~90 min) ·Control: Received 30–60 min of standard education and offered a short booklet outlining a brief overview of diagnosis, symptoms, and treatment of heart failure.	ion, heart failure specific readmission, heart failure knowledge, self-care behaviors	had significantly lower on all-cause readmission (p = 0.005); No significant difference in heart failure specific readmission, heart failure knowledge, self-care behaviors
Huynh et al. (2019)/ Australia [31]	N = 215 Mean age: 73.9 yr M: 51%,	N = 197 Mean age: 74.7	Prior to discharge	2 weeks	3 months	Intervention: Patients were checked for intravascular capacity before	All-cause mortality or readmiss	Intervention group had significa

Authors (Publication Year)/Location	Participants		Time of Initiation	Duration of Intervention Delivery	Follow-Up Period	Intervention	Outcome Variables	Main Findings
	Intervention Group	Control Group						
	F: 49% NYHA: I–II = 30%, III–IV = 70%, Mean LVEF: 39%	yr M: 58%, F: 42% NYHA: I–II = 35%, III–IV = 65%, Mean LVEF: 40%				discharge and educated in self-care and exercise by leaflet and video instruction. Cardiac nurse's phone calls (twice) for transition coach and support. Home visits (twice) provided an opportunity to react to any outstanding or emerging issues to prevent them from growing into more serious events, as well as to provide patients with mental and physical support. Control: Received a standard disease management program and standard discharge plan.	ion, all-cause mortality, all-cause readmission	ntly lower on all-cause mortality or readmission (95% CI = 0.46–0.84), all-cause readmission (95% CI = 0.45–0.88); No significant difference in all-cause mortality

Note: IG = intervention group; CG = control group; M = male; F = female; NYHA = New York Heart Association; LVEF = left ventricular ejection fraction; QoL = quality of life; CD-ROM = compact disc read only memory; ED = emergency department; DVD = digital versatile disc; CI = confidence interval.

2.4. Assessment of Methodological Quality

The Cochrane Risk of Bias (RoB) tool [21] was used to classify each study's quality as high, low, or unclear. Two authors (YJS and HJL) independently assessed the quality of the studies included in this review, noting their level of agreement. Differences between the two authors were resolved through discussion with a third author (JYC).

2.5. Data Synthesis

The study design heterogeneity (e.g., sample size and duration of intervention) was taken into consideration when we used the random-effects model to calculate individual effect sizes and perform a meta-analysis using Comprehensive Meta-analysis software (version 3.0; Biostat, Englewood, NJ, USA). The heterogeneity was measured using the X2 test (statistical significance when $p < 0.05$) and the I2 statistic with its 95% CI. We were unable to evaluate the publication bias because the meta-analysis results included fewer than 10 studies, which precluded evaluation of publication bias [23].

3. Results

It was determined that there was a comparatively small overall risk of bias in this review (Figure 2). In all eight trials, the three categories of reporting, attrition, and detection were deemed sufficient. Six studies (75%), blinding the data collecting process, allocation concealment, and random sequence generation were deemed sufficient techniques; however, two research [24, 31] did not address these topics. As a result, it was unclear how likely these studies were to be biased (Figure 3).

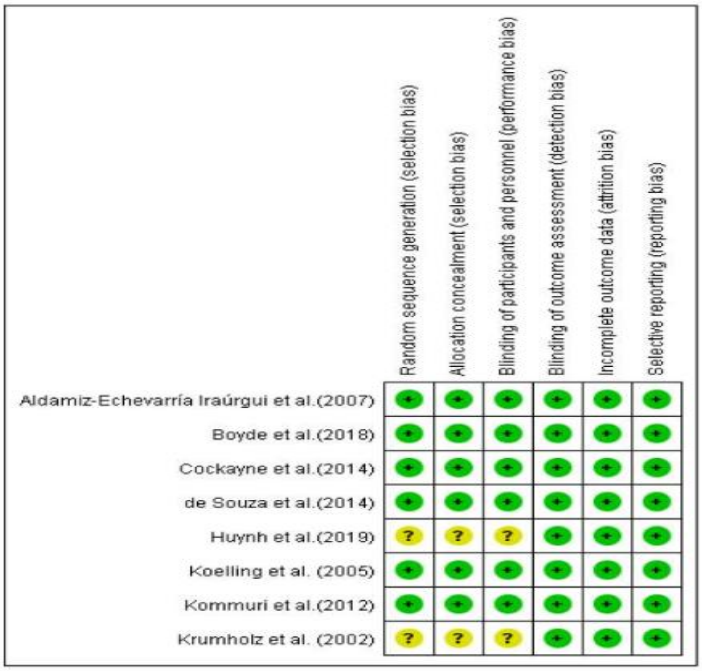


Figure 2 Risk of bias graph

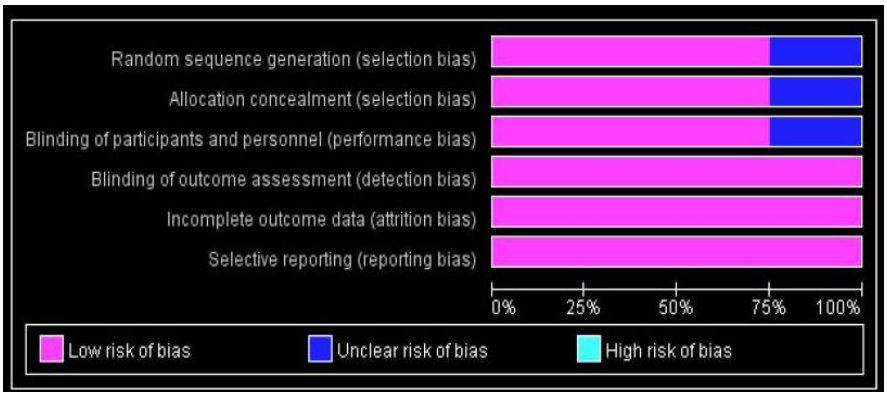


Figure 3 Risk of bias summary

4. Conclusion

Our results demonstrate the advantages ofOur results demonstrate how heart failure self-care education delivered by nurses improves clinical outcomes like readmission and mortality. The effectiveness of nurse-led treatments in improving patient-reported quality indicators, such as illness awareness and quality of life, remains unclear, nevertheless. More RCTs with longer follow-ups are therefore required in order to potentially have long-term impacts and influence patients' behavioral changes. Additionally, nurse-led heart failure teaching initiatives ought to be methodically organized both at the time of diagnosis and before patients are released from the hospital. The function and responsibilities of nurses in carrying out nurse-led heart failure interventions should be clearly stated in each program in order to increase the efficacy of nurse-led approaches.

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