APPROPRIATE EDUCATIONAL INTERVENTIONS IN PATIENTS WITH HEART FAILURE: A SCOPING REVIEW

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Abstract. This review aimed to determine effective educational intervention in heart failure patients. The method of searching for articles, based on Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, utilized three databases, namely Google Scholar, PubMed, and Science Direct. Inclusion and exclusion criteria for such searching were determined using the Population, Intervention, Comparison, Study design (PICOS) method. A total of 645 articles were retrieved (523 from Google Scholar, 78 from Science Direct, 44 from PubMed), and 57 duplicates were eliminated. Following screening, 565 out of 588 articles were excluded as they did not meet the inclusion criteria which were (1) being written in English, (2) focusing on heart failure patients, (3) being randomized control trials and (4) full-text articles were available. Articles that did not use educational interventions in heart failure patients and gray literatures (dissertations and books) were also excluded. Finally, 23 articles were eligible and were analyzed in this review. The most of educational programs for heart failure patients consist of several sessions delivered over a period of time. Follow-up after education is needed to monitor the patient's ability to adapt to the treatment regimen. Educational intervention is essential for empowering heart failure patients to be knowledgeable and actively involved in their self-care. Providing appropriate education could increase knowledge and help improve self-care behavior in heart failure patients.

Keywords: educational intervention, educational program, providing education, self-care, heart failure patients

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INTRODUCTION

Heart failure is a chronic condition that affects 26 million people around the world and imposes a tremendous medical burden due to high hospitalization and mortality rates (Ponikowski *et al*, 2016; Rahimi Kordschooli *et al*, 2018. Patients with heart failure frequently have symptoms such as shortness of breath, peripheral edema, and fatigue that occur frequently and worsen unexpectedly (McDonagh *et al*, 2021). Numerous patients still have unresolved symptoms after being discharged from the hospital, even those who receive the best care possible during their stay (Chang *et al*, 2020).

Self-care is a crucial part of a multidisciplinary heart failure management program and has been demonstrated to minimize mortality, rehospitalization, and enhance the quality of life in heart failure patients (Jaarsma *et al*, 2021). Self-care in heart failure patients focuses on enhancing health, maintaining symptoms, and managing them to enhance physical function, avoiding problems, and quality of life (Koirala *et al*, 2018). Appropriate self-care is key for heart failure patients' quality of life and prevention of hospitalization (Lee *et al*, 2018).

Inadequate self-care in heart failure patients is influenced by a lack of self-care knowledge and information (Herber *et al*, 2019). Knowledge of heart failure has a correlation with the practice of self-care behavior in patients with heart failure as an important predictor of self-care behavior (Beker *et al*, 2014; Herber *et al*, 2019). Inadequate knowledge about heart failure leads to poor engagement rates in self-care practices (Sitotaw *et al*, 2022). Heart failure practice guidelines generally recommend patient education to improve patient knowledge and enhance self-care (Ponikowski *et al*, 2016; Yancy *et al*, 2013).

Self-care education is crucial for empowering patients with heart failure to be knowledgeable and actively involved in monitoring their status and optimizing their treatment (Son *et al*, 2020a). Improvements in

self-care knowledge and practice have been linked to heart failure education interventions (Hwang *et al*, 2020). The implementation of an education program enhances the knowledge and self-care of heart failure patients (Tawalbeh, 2018). This review aimed to determine effective educational intervention in heart failure patients.

MATERIALS AND METHODS

Searching for articles in this review utilized three databases: Google Scholar, PubMed, and Science Direct based on Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The search covered articles published between 2018 and 2022. The search was performed using keywords such as "educational program", "educational interventions", "self-care", "heart failure patients", and "randomized control trials" with Boolean search methods (Frants *et al*, 1999) such as "AND", and "OR" to find relevant articles that match the purpose of writing a review. Article search focused on reputable articles, namely original, full-text, English-language articles. Exclusion criteria were review articles, gray literature, papers, book chapters, personal opinions, or non-scientific publications. The inclusion and exclusion criteria were defined using the Population, Intervention, Comparison, Outcome and Study design (PICOS) method, with modifications made to fit the review's objective (Table 1).

RESULTS

Fig 1 shows the selection results in a flowchart using the PRISMA guidelines. Following a search, 645 items were retrieved from Google Scholar, Science Direct, and PubMed. The retrieved articles were subjected to a duplicate selection process using the Endnote 20 software program (https://support.clarivate.com/Endnote/s/article/Download-EndNote?language=en_US); the result revealed 57 articles with similarities which later be eliminated.

Table 1
Search categories in PICOS headings

Categories	Included	Excluded
Population	Heart failure patients	Patients with diabetes mellitus, COPD, heart failure and families or caregiver of patients with stroke
Intervention	Health education program given by nurses	Health education program given by others healthcare providers
Comparison	Usual care or standard care	None
Outcome	Educational interventions in heart failure patients are effective in improving self-care	None
Study design	Randomized control trials	Research articles that use quasi-experimental designs, mix-methods, cross-sectional study and review articles

COPD: chronic obstructive pulmonary disease; PICOS: Population, Intervention, Comparison, Outcome, Study design

After eliminating duplicates, 588 articles were determined against the inclusion and exclusion criteria. There were 463 articles that did not meet the preset inclusion criteria, therefore, 125 articles were selected for the preliminary review. During the preliminary review, 102 items were not considered appropriate for usage. Then, 23 articles were considered appropriate for inclusion of this scoping review.

According to the review results (Table 2), 23 articles address how education might improve disease knowledge and self-care, therefore, decreasing the risk of rehospitalization and mortality; 15 articles carry out the educational interventions of educational materials in several sessions and 8 articles evaluate the effectiveness of the educational interventions delivered then suggest the follow-up on such interventions.

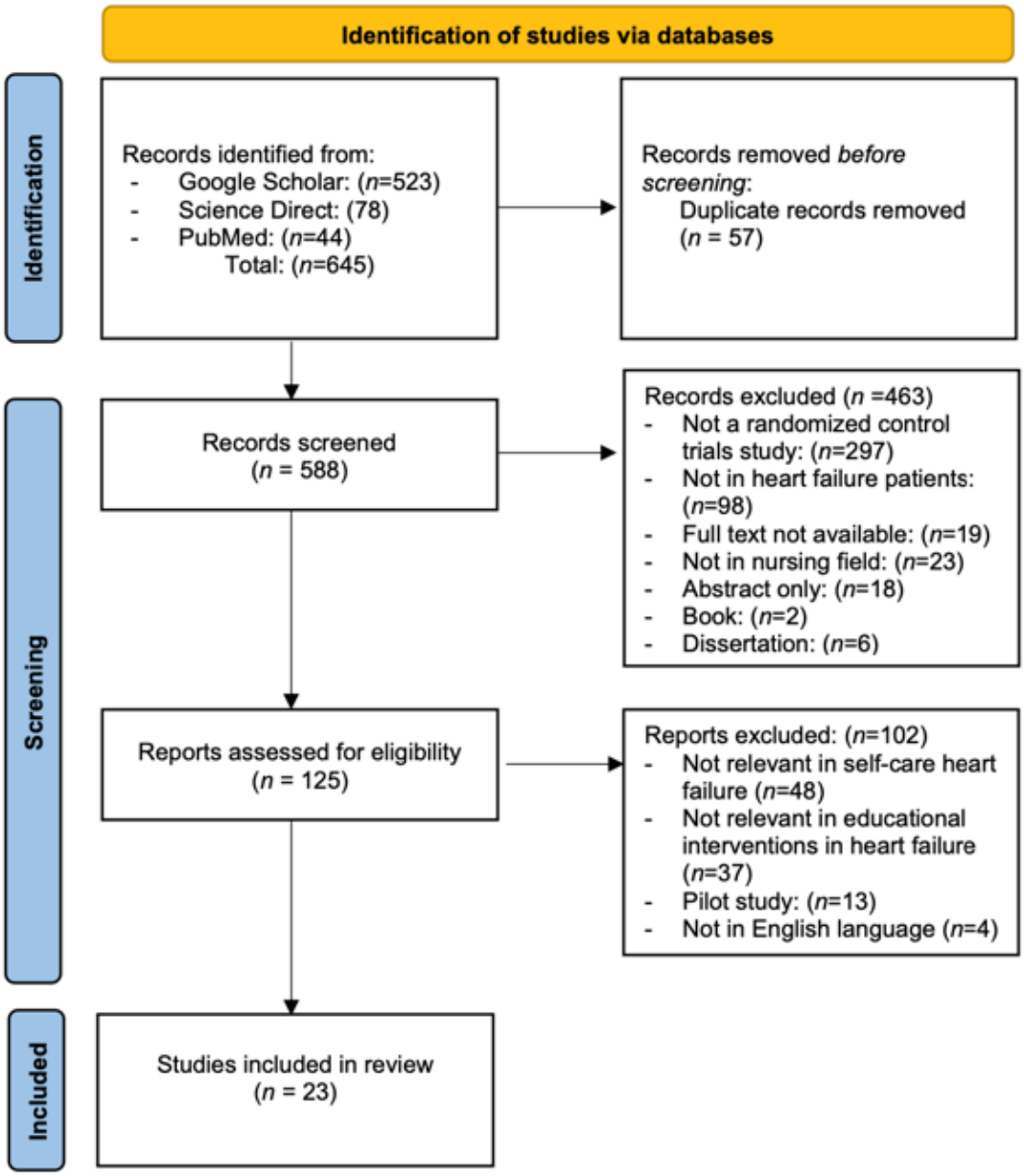

Fig 1 - Flowchart of articles selection process using Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)

Table 2

Summary of the review's analysis of educational interventions provided to patients with heart failure

Reference	Study site	Interventions	Findings
Dessie *et al* (2021)	Nepal	Education was given in four sessions over four days.	Providing education programs significantly improved self-care adherence in heart failure patients
Boyde *et al* (2018)	Australia	Education was provided via digital video disc (DVD) with a duration of 60-90 minutes.	Educational intervention through multimedia could increase knowledge and self-care scores of but there was no significant difference between the intervention and control groups.
Cui *et al* (2019)	China	Structured educational intervention was divided into sessions during hospitalization and after discharge.	A structured nurse-led education intervention delivered during and after hospitalization enhanced self-management abilities and lowered the risk of rehospitalization within 12 months of discharge.
Wonggom *et al* (2020)	Australia	The educational program was divided into four sessions and is given through the Avatar educational application	Education provided by the application might enhance knowledge, but has no statistically significant impact on the self-care component.
Sadeghi Akbari *et al* (2019)	Iran	The educational program consisted of three 30-minute sessions on three consecutive days, as well as weekly 10-minute phone conversations for eight weeks.	This educational program could be utilized as a discharge plan to improve quality of life, self-care, and disease perception.
Van Spall *et al* (2019)	Canada	The educational program was provided together with a follow-up program in a discharge planning.	The provided educational program was not relevant to the patient's clinical state, but it could serve as a model for the transition from hospital care to home care.

Table 2 (cont)

Reference	Study site	Interventions	Findings
Deek *et al* (2021)	Lebanon	Education was provided by involving the existing Lebanese ethnic culture. The provision of self-care education was divided into several topics.	This educational program offered the chance to reduce mortality and readmission rates.
Chew *et al* (2021)	Singapore	Education was given face-to-face using a booklet which is divided into four parts	The approach was successful in enhancing heart failure self-care and had the potential for clinical adoption and generalization to other chronic conditions.
Guo *et al* (2017)	China	The patient's educational program consisted of eight components, plus extra patient self-support items. Patients accessed the intervention program through mobile device.	The knowledge, medication adherence, and quality of life of people with heart failure could be enhanced by educational programs.
Chang *et al* (2020)	Taiwan	The educational program for heart failure patients comprised of multiple topics and was delivered individually. There was a teach-back method for assessing and reinforcing the participants' awareness of their heart failure, as well as discussing how to manage symptoms through lifestyle changes or medication.	According to findings, educational programs for enhancing self-care were successful. However, during the 3-month follow-up, it had no significant influence on self-care maintenance and self-care confidence.
Sahlin *et al* (2022)	Sweden	Education was delivered interactively using specialized tools, with follow-up occurring every five days.	Education could enhance self-care and reduce the risk of recurrent hospitalizations.

Table 2 (cont)

Reference	Study site	Interventions	Findings
Collins *et al* (2021)	United States	The patient received the education program from the moment they arrived at the emergency room until three months after they returned home. Education was provided in phases, and home visits were used for follow-up.	Integrated education from patients admitted to patients being treated at home could improve the patient's quality of life and health conditions for up to 30 days following discharge.
Elpida *et al* (2021)	United States	Education was provided through a constructive technique, with educational material divided into ten sessions, 60 to 90 minutes of education per session.	Educating the intervention group led to a significant increase in knowledge, quality of life, self-efficacy for appropriate medicine use, and self-care practices.
Yu *et al* (2022)	China	Education was given in groups (4-5 heart failure patients per group) with five face-to-face education sessions.	Educational programs by empowering patients could improve significantly in knowledge, self-care, symptom perception, quality of life.
Melin *et al* (2018)	Sweden	The patient was educated via a special tablet that contains a section of educational material consisting of several sessions and a section for monitoring the patient's symptoms.	Education using tablet computers significantly enhanced self-care practice and health-related quality of life, increased knowledge of heart failure, and decreased hospitalization days.
Hwang *et al* (2022)	South Korea	Education was provided in several educational sessions on self-care management of heart failure during hospitalization and three telephone calls after discharge from the hospital.	A telephone follow-up and educational intervention decreased all-cause mortality while enhancing knowledge, self-care behavior, and quality of life.

Table 2 (cont)

Reference	Study site	Interventions	Findings
Abbasi *et al* (2018)	Iran	The educational program comprised of three 3-month-long sessions. Depending on participant needs, each session lasted between 45 and 60 minutes.	The self-management education program could be viewed as a strategy for enhancing quality of life, reducing psychological symptoms, and enhancing social and economic situations for people with heart failure.
Hwang *et al* (2020)	South Korea	Education was delivered face-to-face for around 50 minutes per educational session and followed-up by telephone for two months	Simple educational interventions were successful in enhancing heart failure patient knowledge and self-care. To guarantee that the educational intervention has a lasting impact, annual booster sessions and follow-up sessions might be conducted.
Jiang *et al* (2021)	Singapore	Patients received three education sessions, a self-management toolkit (eg, a visual reminder of fluid intake and an alarm reminder for medication adherence), and home visits every two weeks for six months as well as follow-up.	The provided educational program could enhance heart failure patients' self-care management, self-efficacy, quality of life, and depression levels.
Amaritakomol *et al* (2019)	Thailand	When a patient was going to be discharged from the hospital, interactive games were used to educate them.	An interactive instructional board game was an effective educational tool and may be utilized as an alternate educational method for patients with heart failure. As part of a complete educational program, an interactive educational board game improved heart failure patients' knowledge and self-care practices.

Table 2 (cont)

Reference	Study site	Interventions	Findings
Tavakoly Sany *et al* (2019)	Iran	Education was provided through the use of a three-part focus group discussion method. Every educational session was sixty minutes.	This educational intervention might be an effective method for increasing health literacy and self-care confidence among patients with heart failure.
Hsu *et al* (2021)	Taiwan	The educational program was conducted over the course of four weeks, with each session lasting 20 to 30 minutes. Additionally, patients received twice-weekly follow-up and telephone therapy.	This educational program could improve self-care understanding and practice. In addition, telephone follow-up enhanced patient comprehension following the educational session.
Zuraida *et al* (2022)	Indonesia	The educational programs consisted of health coaching, the use of heart failure self-management booklets and logbook, with two follow-up home visits.	The provision of self-care management education through health coaching might improve self-care and positively affect the outcomes of heart failure patients.

DISCUSSION

Nurses perform a crucial role in interacting with patients, including educating patients about self-care prior to discharge (Hany and Vatmasari, 2021). Heart failure education programs conducted by nurses are a crucial element of promoting heart failure patients' self-care (Huesken *et al*, 2021). Current guidelines emphasize the necessity of patient and family education on heart failure management and the importance of patient and family knowledge (Bidwell *et al*, 2018).

Certain health education approaches are required for them to comprehend and retain information regarding self-care (Zeng *et al*, 2017). According to the study findings, the most of education for heart failure patients was divided into several sessions at a particular time (Abbasi *et al*, 2018; Elpida *et al*, 2021; Hsu *et al*, 2021; Hwang *et al*, 2020; Jiang *et al*, 2021; Melin *et al*, 2018; Tavakoly Sany *et al*, 2019; Yu *et al*, 2022). It is essential to educate patients intensely through targeted multi-sessions, therefore they are able to retain the information given in phases (Deek *et al*, 2017).

Education could be provided individually or through group discussions (Sadeghi Akbari *et al*, 2019; Chang *et al*, 2020; Dessie *et al*, 2021; Tavakoly Sany *et al*, 2019; Yu *et al*, 2022). Group-based intervention is one strategy employed by disease management programs in heart failure patients (Arruda *et al*, 2018; da Silva *et al*, 2015). Providing intervention through self-help groups facilitates the implementation of self-care behaviors because it may encourage patients to believe in their ability to overcome their illness (Son *et al*, 2019). In addition to providing education through groups, providing individual education can be carried out with interactive educational programs that will be more interesting and will facilitate patient understanding of instructional content (Sahlin *et al*, 2022; Amaritakomol *et al*, 2019).

Existence of educational interventions could enhance the patient's understanding, resulting in modifications to the patient's attitude and self-

care behavior (Huesken *et al*, 2021). Education interventions are designed to enhance patient knowledge, self-care, and eventually health-related quality of life while lowering hospitalization and mortality rates (Barnason *et al*, 2017). Educational programs might also reduce psychosocial symptoms and levels of depression (Abbasi *et al*, 2018; Jiang *et al*, 2021).

Educational interventions could be enhanced through the use of follow-up programs (Sassen, 2018). In patients with heart failure, the presence of a follow-up program would enhance self-care, quality of life, and patient readmission rates (Sezgin *et al*, 2017). Program of follow-up that can be conducted via telephone or home visits (Hwang *et al*, 2020; Collins *et al*, 2021; Jiang *et al*, 2021; Hsu *et al*, 2021; Zuraida *et al*, 2022).

Follow-up through individual home visits was found to reduce the risk of recurring hospitalizations and self-care in heart failure patients (Sassen, 2018). However, there are challenges to follow-up through house visits, including cultural issues, negative community perceptions, security and safety concerns, and a lack of trust in nurses (Gohari *et al*, 2022). In addition to follow-up through home visits, there is a follow-up by telephone that can assist patients in increasing knowledge and self-care in heart failure patients (Awoke *et al*, 2019).

Previous research has found that telephone follow-up within 7 days of discharge can increase patient participation in effective self-care (Boisvert *et al*, 2015). Telephone follow-up facilitates nurse discussions with heart failure patients to raise their disease knowledge, identify their own self-care practices, and strengthen their motivation to make self-care improvements (Hsu *et al*, 2021). Telephone follow-up could also enhance heart failure patients' adherence to treatment (Son *et al*, 2020b).

In conclusion, nurses have an important role in providing education especially in patients with heart failure. Educational intervention is essential for empowering heart failure patients to be knowledgeable and actively involved in their self-care. Educational interventions in heart failure patients can be divided into several sessions with various educational media.

Providing appropriate education can increase knowledge and help improve self-care behavior in heart failure patients.

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CONFLICT OF INTEREST DISCLOSURE

The authors declare no potential conflict of interest.

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