

IDENTIFICATION OF EARLY MOBILIZATION INTERVENTIONS IN CARDIOVASCULAR DISEASE PATIENTS IN HOSPITAL

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ABSTRACT

This study aims to categorize various early mobilization therapies in heart disease patients. The research method used is a systematic review by searching for articles using the Science Direct, PubMed, and Google Scholar databases. Key phrases included "early mobilization," "exercise training," and "cardiovascular disease and heart failure." The results showed that the interventions had 6MWT, CPET, progressive mobilization I, muscle breathing/inhalation training on day I, leg and limb exercises on the second and third days, ambulation, limb exercises, sitting, and walking. Around the bed, low-intensity resistance exercises in bed, and standing and tiptoe exercises on the floor beside the bed. Patients with acute heart failure often receive 20 to 40 minutes of therapy daily, including bedside exercises and a 50-step walk. In conclusion, there are still differences in time, scope, and implementation of early mobilization initiatives. However, mobilization therapy can be given to cardiac patients of all ages and is safe and practical. They help reduce re-hospitalization risk and improve a patient's VO₂ and quality of life (QOL).

Keywords: Heart Failure, Exercise, Early Mobilization, Exercise, Cardiovascular Disease

INTRODUCTION

Most incidences of cardiovascular disease (CVD), which affects both men and women equally, occur in industrialized and developing nations. One of the most prevalent cardiac conditions, heart failure is the result of different heart disorders. Even after receiving the best possible care, heart failure patients frequently have difficulties like activity intolerance and shortness of breath along with a lower quality of life (Pranata et al., 2017). Heart failure is one of the leading reasons of hospitalization in adults and the elderly, with comparatively high rates of morbidity and mortality (Suzuki et al., 2019).

The World Health Organization estimates that 17.9 million fatalities globally each year are caused by cardiovascular disease (CVD), which accounts for 32% of all deaths. More than 75% of CVD deaths (85%) take place in low- and middle-income countries. According to the American Heart Association (AHA), there are 21 heart failure cases for every 1,000 persons in America, with the elderly having the greatest rates of the condition (Benjamin et al., 2018). According to Riskesdas (2018) there are approximately 1,017,290 doctors-diagnosed cases of all sorts of heart disease, including congenital heart problems, in Indonesia (Kemenkes RI, 2019). The prevalence of heart failure identified by doctors in Indonesia was 0.13%, or 229,696 people, according to Riskesdas (2013), and there was a marked rise in heart cases in Indonesia between 2013 and 2018.

Due to the possibility of developing arrhythmias and ischemia, most heart failure patients are frequently advised to rest in bed during the acute period. Yet, prolonged inactivity can result in muscular atrophy and reduce a patient's ability to exercise and engage in daily activities (Ishikawa et al., 2020). decreased cardiac output, as well as secondary issues such pneumonia infection, decubitus ulcers, and deep vein thrombosis (Kanejima et al., 2020). To reduce the frequency of activity disruptions in heart failure patients, intervention is required.

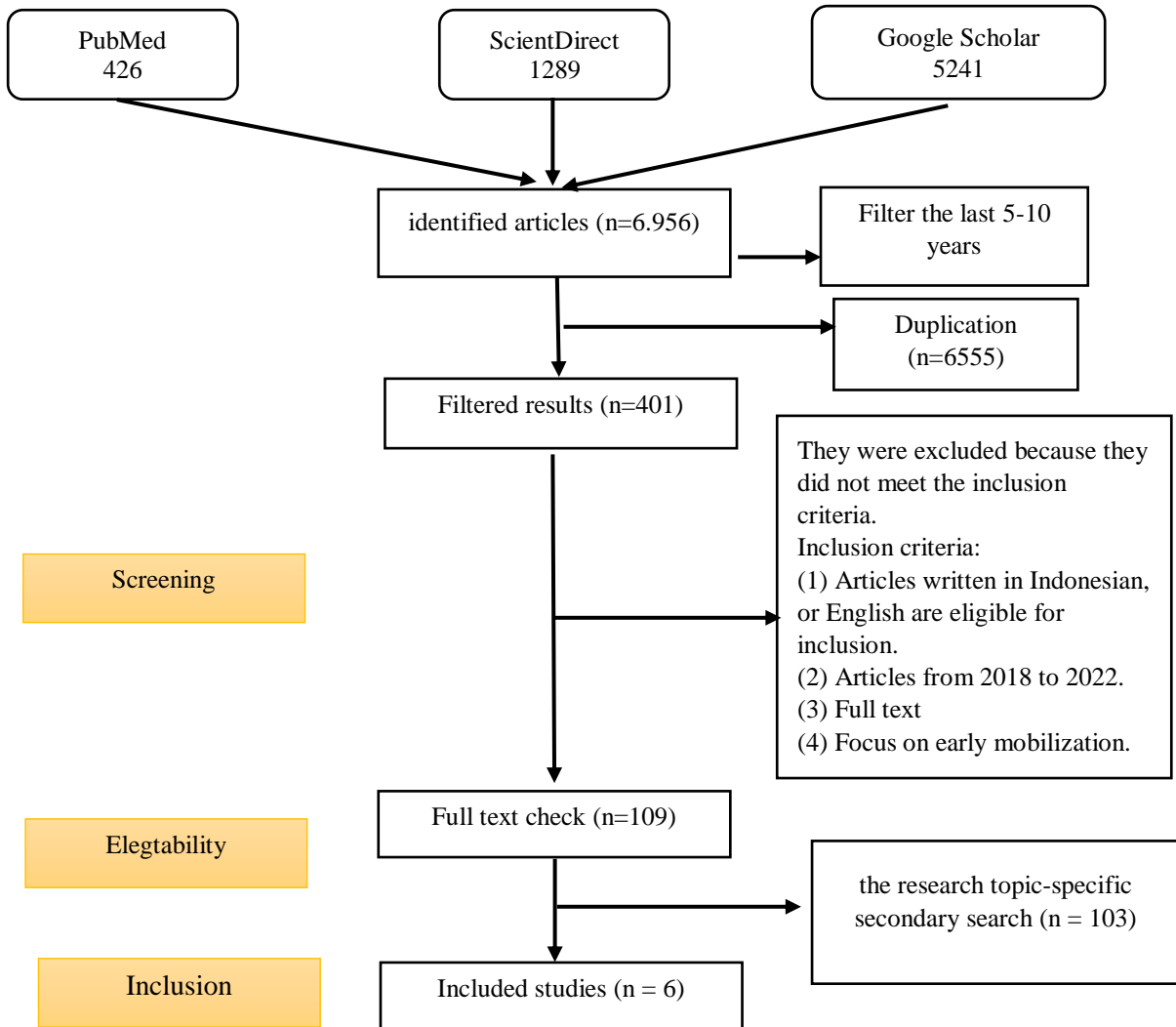
In the acute period of rehabilitation, early mobilization intervention is one of the methods. To avoid cardiac failure, early mobilization is beneficial (primary prevention). Secondary prophylaxis is also advantageous for patients who have experienced heart failure in the past (Cattadori et al., 2018). Heart failure patients are typically treated during the acute phase with a focus on hemodynamic stabilization and bed rest to reduce exercise tolerance. As a result, a given mobilization program can be started at the bedside during the acute phase, and the patient's hemodynamics should be stable as they transition from a lying down position to an upright sitting position in a chair. Early mobilization requires health professionals to keep an eye on vital signs and EKG monitors (Izawa et al., 2019). Heart failure patients must be mobilized as soon as possible because delaying mobilization can raise the risk of cardiovascular disease and subsequent consequences (Ishikawa et al., 2020).

Due to the availability of specialized tools, expertise, and abilities, all of which are obviously necessary, early mobilization management is occasionally nevertheless reluctant to begin early mobilization initiatives (Adamopoulos et al., 2019). Moreover, executing mobilization in heart patients can be hampered by health professionals' ignorance of the procedure (Anekwe et al., 2017). Because they are thought to be helpful in avoiding potential problems and even mortality, health professionals must be knowledgeable about doing basic physical activities like early mobilization. There are still several variances in the way early mobilization programs are put into practice, including those in implementation time, mobilization activities, implementation protocols, and outcomes. Given the stability of the patient's physiological and psychological state, early mobilization interventions can be started when the patient is experiencing an acute condition. Interventions for early mobilization might be carried out within the first 24 hours of admission or within the first 48 to 72 hours of ICU admission (Clarissa et al., 2019). To improve quality of life, hemodynamic stabilization, and reduce rehospitalization events, it is nevertheless expected that patients with heart failure should be conversant with basic physical exercises. This review's goal is to identify the various forms of early mobilization in individuals with cardiovascular disease.

RESEARCH METHODS

The study conducts a review of the literature by following the outcomes of scientific publications using PICO (population, intervention, comparison, and outcome). The review in this instance is concentrated on the execution of early mobilization interventions. The terms "*early mobilization*" or "*exercise training*" and "*cardiovascular disease*" or "*heart failure*" were combined to conduct a thorough database search using PubMed, Science Direct, and Google Scholar. Using the criterion for inclusion (1) English or Indonesian-language articles; (2) Articles from 2018 to 2022; (3) Complete text (4) Emphasizing early mobilization and the following exclusion

criteria: (1) not in line with the research aims; (2) not research findings; (3) duplicate publications; and (4) solely in the form of an abstract.



Figur. 1
Flowchart

RESULT

Table. 1
Description of the Study and Study Result

Author Name, Article Title, Type of Literature	Year	Aims	Findings
Kono et al., Predictive impact of early mobilization on rehospitalization for elderly Japanese heart failure patients, prospective, observational, and predictive study.	2020	To determine whether early mobilization was associated with rehospitalization among elderly heart failure patients.	This study demonstrates that the interval since the patient was admitted to the hospital for mobilization may be a potential predictor for rehospitalization in senior heart failure patients. The first goal for the management of acute-phase HF may be early mobilization within 3 days of hospitalization.

Chen et al., Home-based cardiac rehabilitation improves quality of life, aerobic capacity, and readmission rates in patients with chronic heart failure, randomized prospective trial.	2018	To evaluate the beneficial effects of home-based cardiac rehabilitation on the quality of medical care in patients with chronic HF.	Patients enrolled in the home-based cardiac rehabilitation programs displayed statistically significant improvement in (Equation is included in full-text article.)peak (18.2 ± 4.1 vs 20.9 ± 6.6 mL/kg/min, $P = .02$), maximal 6-Minute Walking Distance (6MWD) (421 ± 90 vs 462 ± 74 m, $P = .03$), anaerobic threshold (12.4 ± 2.5 vs 13.4 ± 2.6 mL/kg/min, $P = .005$), and QOL. In summary, patients receiving home-based cardiac rehabilitation experienced a 14.2% increase in (Equation is included in full-text article.)peak, a 37% increase in QOL score, and an improvement of 41 m on the 6MWD test. The 90-day readmission rate for patients reduced to 5% from 14% after receiving cardiac rehabilitation.
Kakutani et al., Progressive Mobilization Program for Patients With Acute Heart Failure Reduces Hospital Stay and Improves Clinical Outcom, This was a single-center and retrospective study	2019	To determine the feasibility of a mobilization program and its potential safety and efficacy, in order to provide an estimate of the intervention effect size in future clinical trials	We developed a progressive mobilization program for HF patients that classifies the mobilization process into 7 stages based on disease condition and physical function. We retrospectively analyzed 136 patients with acute HF (80 ± 11 years), who were assigned either to the mobilization program (intervention group, $n=75$) or to usual care (control group, $n=61$). The program was safely implemented without any adverse events. Hospital stay was significantly reduced in the intervention group compared with the control group (33 ± 25 vs. 51 ± 36 days, $P < 0.01$). The intervention group had higher activities of daily living (ADL) score at discharge evaluated using the Barthel index (64 ± 38 vs. 49 ± 36 , $P < 0.05$). The intervention group also had a higher percentage of discharge to home (71% vs. 52%, $P < 0.05$) and a lower rate of HF-related readmission (16% vs. 36%, $P < 0.05$) compared with the control group. Conclusions: The progressive mobilization program for acute HF was feasible and was associated with better ADL and reduced hospital stay, leading to improvement of clinical outcome.

Sugiyono et al., Implementation of Evidence Based Nursing: Effects of Early Mobilization in Post Cardiac Surgery (CABG) Patients Experiment	2022	To apply the effect of early mobilization on improving physical function in patients after CABG cardiac surgery based on the latest research results (Evidence- Based Nursing Practice).	The research results show that the application of EBPN obtains a p- value of 0.005. In conclusion, there is a relationship between giving early mobilization interventions and functional ability with the 6 MWT test.
Suzuki et al., Effectiveness of Early Rehabilitation for Acute Heart Failure, retrospective cohort study	2019	to investigate the impact of early rehabilitation on activities of daily living in patients with acute heart failure.	After applying exclusion criteria, a total of 8351 eligible patients with acute heart failure were included in this study. Significantly more Barthel Index decline (18.7% vs 12.4%, $P < .001$) was seen in patients in the no rehabilitation group than in those in the early rehabilitation group. Multiple linear regression analysis showed that early rehabilitation was negatively associated with Barthel Index decline after adjustment (OR = 0.57; 95% CI, 0.46-0.67). Conclusion: This study showed that early rehabilitation could possibly be a feasible alternative for maintenance of the Barthel Index in patients with acute heart failure.
Goldfarb et al., Early mobility in frail and non-frail older adults admitted to the cardiovascular intensive care unit	2018	Little is known about the effects of early mobilization in older adults in the Cardiovascular Intensive Care Unit (CICU).	There were 264 patients in the cohort (77.1 ± 9.3 years old; 40% female; 34% frail). Frail patients were more likely to have lower prehospital, CICU admission, day of transfer LOFs (all $P < 0.001$). The mean LOF improvement during CICU stay was 0.5 ± 0.8 and did not differ based on frailty status. Frailty was not predictive of EM responsiveness in the adjusted analysis. Conclusions: EM is feasible in older adults admitted to the CICU. Functional status improved in both frail and non-frail older adults during CICU admission. Prospective studies are needed to determine whether frail older adults may benefit from EM.

The purpose of this literature review is to determine the types of early mobilization interventions for heart patients. Of the six included articles, three were conducted in Japan, one in Taiwan, one in Indonesia, and one in California. 2 articles

employ the prospective method, 2 the retrospective method, 1 the experimental method, and 1 the study design, participants, and settings.

DISCUSSION

Giving 6MWT mobilization interventions within the first three days of a patient's hospitalization can be an initial target for early mobilization for elderly patients with heart failure to improve the quality of acute phase heart failure treatment and as a predictor of heart failure patient readmission. (Kono et al., 2020). Home-based cardiac rehabilitation, which entails asking participants to perform aerobic exercise at home at least three times per week for at least 30 minutes per session, can increase VO₂ and improve the quality of life (QOL) of patients with heart failure compared to those who do not, thereby decreasing the rehospitalization rate in heart failure patients at 90 days (Chen et al., 2018).

In the acute period of rehabilitation, early mobilization intervention is one of the methods. To avoid cardiac failure, early mobilization is beneficial (primary prevention). Secondary prophylaxis is also advantageous for patients who have experienced heart failure in the past (Cattadori et al., 2018). Heart failure patients are typically treated during the acute phase with a focus on hemodynamic stabilization and bed rest to reduce exercise tolerance. As a result, a given mobilization program can be started at the bedside during the acute phase, and the patient's hemodynamics should be stable as they transition from a lying down position to an upright sitting position in a chair. Early mobilization requires health professionals to keep an eye on vital signs and EKG monitors (Izawa et al., 2019). Heart failure patients must be mobilized as soon as possible because delaying mobilization can raise the risk of cardiovascular disease and subsequent consequences (Ishikawa et al., 2020).

Implementation of a progressive mobilization program in patients with heart failure is an early mobilization intervention that improves the patient's ADL at discharge and reduces the risk of readmission for one year after discharge (Kakutani et al., 2019). The first day of phase 1 rehabilitation included muscle respiratory exercise and respiratory training, followed by leg and limb training on the second and third days, and ambulation on the fourth day. To restore heart function to pre-disease levels in post-CABG patients who can walk 300 meters, limb exercises consisting of sitting and walking around the bed are prescribed (Sugiyono et al., 2022).

Providing early rehabilitation via limb-bending exercises, low-intensity resistance training in bed, and standing and tiptoe position exercises on the floor next to the bed. Those performed for 20 to 40 minutes per day can help heart failure patients of any age maintain their Bartel index score (Suzuki et al., 2019). Early mobilization in adult and elderly heart failure patients is safe and feasible for enhancing the level of function (LOF) from activity in bed to walking more than 50 steps once per shift during hospitalization (Goldfarb et al., 2018).

CONCLUSION

Attention to hemodynamic, psychological, and ECG stabilization, as well as a comprehensive understanding of the patient's medical history, makes early mobilization interventions safe and feasible for patients of all ages with heart failure. Early mobilization has positive effects on patients with heart failure, such as reducing readmissions and enhancing quality of life (QOL). Early patient mobilization implementation There are still variations in the implementation protocol, as well as the

type of mobilization, the time and duration of the implementation, and the duration of the implementation.

SUGGESTION

Hopefully the initial mobilization can be a reference for nurses in providing maximum nursing services for patients.

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