

RESEARCH ARTICLE

ADAPTING NURSING INTERVENTION TO IMPROVE HEART FAILURE PATIENTS' OUTCOMES

Khalil Ahmad¹, Sardar Ali², Prof. Dr Dildar Muhammad³, Shah Hussain⁴, Ashfaq Ahmad⁵¹Principal Hayatabad Institute of Medical Sciences, College of Nursing, Peshawar²Assistant Professor, Institute of Nursing Sciences, Kyber Medical University, Peshawar, Pakistan³Dean/ Professor, Institute of Nursing Sciences, Kyber Medical University, Peshawar, Pakistan.⁴Principal/ Associate Professor, Janbar College of Nursing, Swat.⁵Lecturer, Institute of Nursing Sciences, Kyber Medical University, Peshawar, Pakistan.*Corresponding Author
Sardar Ali

Article History

Received: 09.10.2025

Revised: 24.10.2025

Accepted: 10.11.2025

Published: 25.11.2025

Abstract: *Introduction:* Heart failure is a complex and progressive condition that often begins with vague symptoms but can lead to life-limiting consequences over time. Effective management of heart failure relies heavily on nursing interventions, especially those emphasizing patient-centered care. Among these, physical activity and rehabilitation commonly referred to as mobilization strategies have shown promise in improving functional capacity and reducing hospital readmissions. *Objectives:* This study aimed to adapt a nurse-led mobilization intervention based on the FITT principle for heart failure patients. *Methodology:* A qualitative study was carried out at the Peshawar Institute of Cardiology Peshawar. Data were collected from health care professionals such as nurses, doctors, physiotherapist and patients with heart failure. A total of 16 participants were employed in the study. Participants were employed using purposive sampling technique. Nurses, physiotherapists, and doctors working in the critical care unit involved in patient care and patients currently admitted with heart failure in critical care unit were included in the study. Data were collected using semi-structured interviews. Assessment, Decision, Adaptation, Production, Topical Experts, Integration, Training, and Testing (ADAPT-ITT) Modal was used for adapting the FITT principal. Data were analyzed using thematic analysis. *Results:* The key themes including challenges, perceived benefits and strategies for optimizing mobilization interventions were identified using the thematic analysis approach based on interviews with patients and healthcare professionals. FITT principle was used to modify the interventions that are based on patient preferences as well as healthcare provider insights. *Conclusion:* The results of this study underscore the need for tailoring mobilization interventions to patients' experiences as well as healthcare professional's insights. The intervention adapted to the FITT criteria ensures feasibility and adherence. Adopting this model may help the patients in fast recovery.

Keywords: Adaptation, Nursing Intervention, Heart Failure, Patients, ADAPT-ITT Modal

INTRODUCTION

Heart failure (HF) is the clinical syndrome that results from any structural or functional impairment of ventricular filling or ejection of blood. It's a life-threatening condition in which the heart is unable to pump blood throughout the body. 1 Heart failure is a major public health problem of worldwide prevalence, morbidity, mortality, and high economic burden. Despite tremendous advances in the management of heart failure, its therapy is nonetheless challenging, and this warrants coordinated efforts using pharmacologic or non-pharmacologic therapies. 2,3

The American Heart Association (AHA) reports that there are 21 cases of heart failure for every 1,000 people in the country, with the elderly having the highest incidence of the illness. 4 It is estimated that in the United States, approximately 6.9 million adults have heart failure, an important number projected to increase significantly in the upcoming decades, according to the American Heart Association (AHA). 5 The European Society of Cardiology (ESC) states that heart failure affects from 1 to 2% of adult population in developed countries and is more prevalent in older adults. 6

Approximately 64.3 million individuals worldwide, with a similar distribution of men and women, are affected by

heart failure. The prevalence of the disease is between 1% to 3% in developed nations such as Pakistan, India and Bangladesh, but it rises to about 10% among those over the age 65 years of age. 7 According to estimates from the World Health Organization, cardiovascular disease (CVD) causes 17.9 million deaths worldwide annually, or 32% of all fatalities. Eighty-five percent (85%) of deaths from CVD occur in low- and middle-income nations. 8

In recent epidemiological studies, a rising incidence of these cases has been observed. There's not only a rise in heart failure around the world, but mortality and hospitalization are also increasingly associated with heart failure, despite enormous efforts to manage this disease. The increase mortality rate not only a concerning issue but heart failure is associated with severe consequences with may lead to high morbidity. 9,10

Management of heart failure includes a multicomponent process of lifestyle modification, pharmacologic therapy, device therapy, and surgical intervention. For HFrEF, guideline directed medical therapy includes ACEIs, ARBs, beta blockers; mineralocorticoid receptor antagonist and sodium glucose co transport 2 inhibitors. These drugs have been demonstrated to improve

survival, reduce hospitalizations and improve the quality of life. 11,12

Heart failure management also depends on non-pharmacologic interventions. Dietary modifications, fluid restriction, regular exercise, weight control and smoking cessation are considered to be the major factors which include these. Some elements of comprehensive care include patient education and self-care practices like daily weight monitoring and detecting early signs of decompensating. 13

In the health care settings, nurses have a vital role in the management of heart failure patients. Nursing interventions are created to satisfy their physical, emotional and psychosocial needs of patients thereby adhering to the treatment plans and make the person generally alright. 14 There are certain key nursing intervention for heart failure management includes educating the patients and their families about the nature of heart failure, treatment options, medication adherence, dietary restrictions, lifestyle modifications, etc. 15 Anticipation that patients will understand their medication regimen, likely side effects, as well as the significance of adhering to it is necessary. 16 Medication reconciliation, administration, and monitoring directed to adverse effects are attributes in which the nurses are playing a key role. 17

However, the effect of heart failure on the emotional and psychological life of patients and their families can be severe. For example, counseling, support groups and referrals to other mental health services help in dealing with anxiety, depression and other psychosocial related issues. The ADAPT-ITT model, originally designed to guide the adaptation of public health interventions, provides a systematic approach to modifying existing interventions to fit new populations and contexts. By applying the ADAPT-ITT model, this study aims to explore how a mobilization intervention based on the FITT principle can be effectively adapted to the unique needs of heart failure patients, to improve outcomes such as hospital stay duration, functional independence, and overall prognosis. 18 Adapted nursing intervention gives a great understanding by which evidence-based practices can be formed or policy decisions can be adopted. These findings can play a role in the development of comprehensive care models that are patient centered and will reduce hospital readmissions, improve quality of life, and decrease heart failure related health care costs.

Methodology

This study employed a qualitative exploratory research design guided by the ADAPT-ITT model to adapt a

nurse-led mobilization intervention for heart failure patients. The research was conducted in the Critical Care Unit of the Peshawar Institute of Cardiology, located in district Peshawar. A purposive sampling technique was used to recruit participants, including four heart failure patients, four nurses, four doctors, and four physiotherapists directly involved in patient care. Inclusion criteria focused on healthcare professionals working in the critical care unit and patients currently admitted with heart failure. The study utilized the first four phases of the ADAPT-ITT model—Assessment, Decision, Administration, and Production—to ensure systematic adaptation of the intervention. The FITT (Frequency, Intensity, Time, and Type) principle, recognized as an evidence-based intervention, was selected and modified to align with the local clinical and cultural context while maintaining fidelity to its theoretical framework

Data Collection Procedure

Data were collected through semi-structured interviews designed specifically for healthcare professionals and heart failure patients. The interview guide included questions related to participants' perceptions and beliefs about heart failure mobilization, application of the FITT criteria, challenges and barriers in implementation, and suggestions for improving the intervention. Interviews were conducted in a clinical setting, ensuring participant comfort and confidentiality. All interviews were audio-recorded with consent and later transcribed into English for analysis. Ethical approval for the study was obtained from the Khyber Medical University ethical review board, ensuring adherence to ethical standards such as informed consent, confidentiality, and voluntary participation.

Data Analysis Procedure

The collected data were analyzed using thematic analysis following the six-phase framework proposed by Virginia Braun and Victoria Clarke. Initially, audio recordings were transcribed verbatim and reviewed multiple times to ensure familiarity with the data. In the second phase, initial codes were generated systematically across the dataset. These codes were then organized into categories, which were further refined into overarching themes representing key patterns in the data. Subsequent phases involved reviewing, defining, and naming the themes to ensure coherence and relevance to the research objectives. This rigorous analytical process ensured credibility, depth, and consistency in interpreting participants' experiences and perspectives regarding the adapted intervention.

Results

Demographic Analysis

The study sample (n=16) consisted of two distinct cohorts: healthcare professionals (n=12), including nurses, doctors, and physiotherapists from the critical care unit, and heart failure patients (n=4) admitted to the Peshawar Institute of Cardiology.

Among the professional participants, roles were equally distributed to capture multidisciplinary perspectives, with no specific gender or age restrictions applied beyond direct involvement in patient care. The patient cohort included both male and female adults currently undergoing treatment for heart failure, with data collection prioritized for individuals capable of providing informed consent without severe cognitive impairment.

Thematic Analysis (Health Care Professionals Data)

Thematic analysis was done after the interviews. A total of five themes were generated after codes and categories. These themes are Strategies for Optimizing FITT Components in Mobilization, Impact of FITT-Based Interventions on Patient Outcomes, and Challenges in Implementing FITT-Based Interventions, Perceived Benefits of a Nurse-Led Intervention and Current Practices and Limitations in Patient Mobilization (Figure 1).

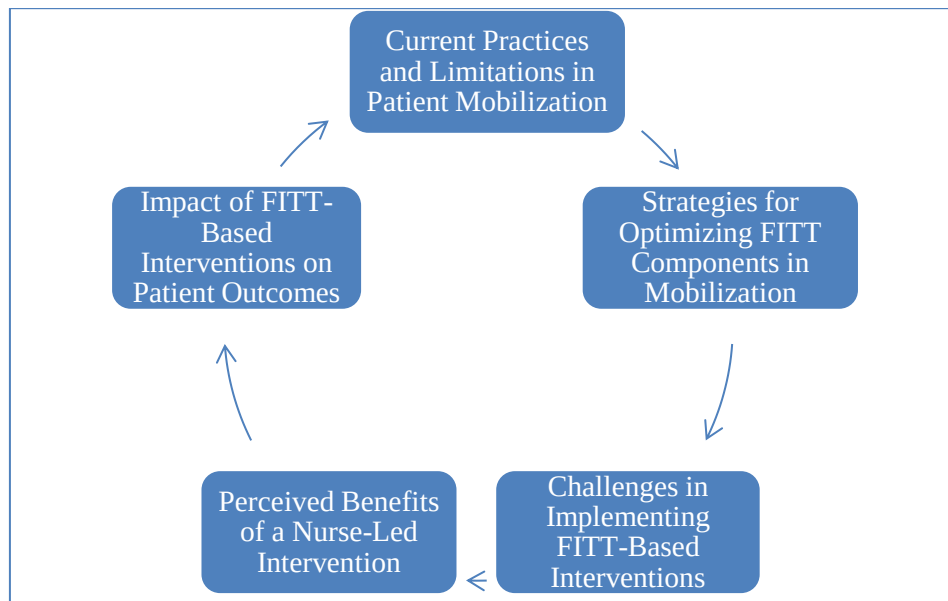


Figure 1: SmartArt Depicting Extracted Themes after Thematic Analysis

Thematic Analysis (Patient's data):

Thematic analysis of patient's data was done. Themes such as Patients' Experience with Mobilization, Perceived Benefits of Mobilization, Challenges in Mobilization, Patients' Preferences for Mobilization and Feedback on Nurse-Led Mobilization Program were extracted from the data (Figure 2).

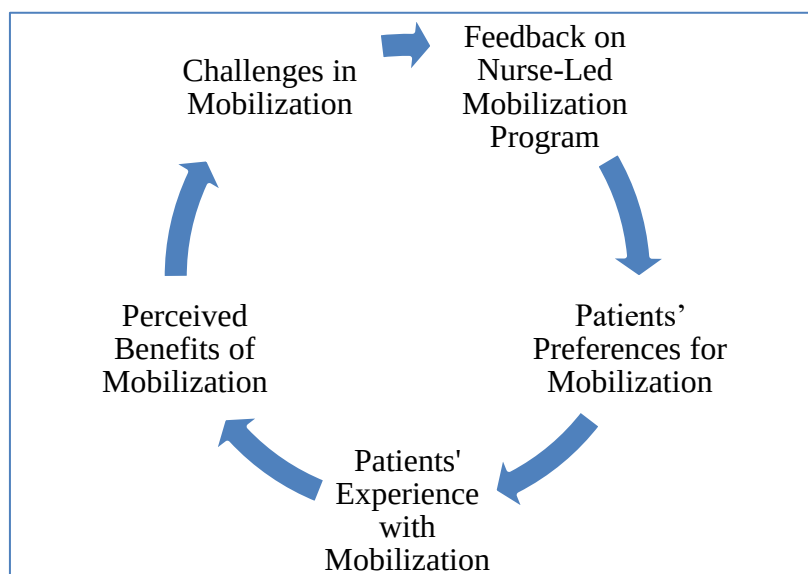


Figure 2: Thematic analysis of heart failure patient's data

Application of ADAPT-ITT Model to for adapting evidence based Interventions for Heart Failure patients

Based on the FITT (Frequency, Intensity, Time, and Type) principle, and as per the evidence of the European Society of Cardiology (ESC), there exist interventions for heart failure patient mobilization (EBIs). Yet these interventions need to be modified so as to be in unison with findings of thematic analysis of healthcare professionals and patients

Table 1: European Society of Cardiology Guidelines for patients with heart failure

SNO	FITT Component	ESC Recommended Interventions
1	Frequency	Exercise 3–5 days per week.
2	Intensity	Moderate intensity (40–70% VO ₂ max or HR reserve).
3	Time	20–60 minutes per session, depending on tolerance.
4	Type	Aerobic exercise (walking, cycling), resistance training, and breathing exercises.

Comparison of Modified ESC guidelines and Modified ADAPT-FITT Interventions Integrating Thematic Findings:

The results are compared to the European Society of Cardiology (ESC) guidelines for mobilization of heart failure patients with modified interventions through thematic analysis of interviews with patients and healthcare professionals. The changes were brought about to solve practical issues, patient wants, and healthcare provider suggestions. The intervention consists of greater frequency of sessions and shorter, more manageable sessions, decreasing intensity by patient fatigue levels, exercise time into smaller intervals with rest breaks as well as more functional mobility and breathing exercises before structured aerobic activities. They are consistent with how patients report being fatigued, breathless and weak and they should be safe and effective ways of mobilizing patients at home (Table 2).

Table 1: Comparison between ESC's interventions and FITT guidelines using ADAPT-ITT model

FITT Components	ESC Guidelines for Mobilization in Heart Failure Patients	Modified Interventions Based on Thematic Analysis	Justification for Modification
Frequency (F)	3–5 sessions per week	4–6 sessions per week, with shorter, more frequent activities	Patients and nurses highlight the need for frequent but shorter sessions to prevent exhaustion.
Intensity (I)	Moderate (40–60% peak VO ₂ or heart rate reserve)	Light to moderate, individualized based on fatigue levels and patient feedback	Patients reported fatigue and breathlessness, requiring personalized intensity adjustments.
Time (T)	20–45 minutes per session	10–20 minutes per session, divided into 5–10 minute intervals with rest breaks	Patients preferred shorter sessions due to fatigue and weakness, confirmed by nurse observations.
Type (T)	Aerobic (walking, cycling), resistance training, flexibility exercises	Aerobic (short-distance walking), functional mobility (bedside-to-chair transfer), resistance training (low-intensity), breathing exercises	Healthcare professionals suggest prioritizing functional mobility and breathing exercises before structured aerobic training.

The interview results are explicated specifically in the table 3 with the second table serving as a comparison of ESC recommended mobilization interventions to the modified interventions. In an example, patients choose guided, nurse assisted short walking sessions to conduct agitation in the way of continuous 20–30 minutes of walking. Adaptation of resistance training to seated exercises with resistance bands when there is weakness in the leg. To reduce fall risks, function task training, such as sit to stand transfers, are adapted to simple bedside to chair transfers and balance drills. Prior to mobilization, patients and professionals emphasized pre-mobilization breathing exercises to help patients manage dyspnea and anxiety, which both role factors. Motivational coaching by nurses is also used to enhance adherence and increase the confidence of the patient in subject to mobilization activities

Table 2: Specific Mobilization Interventions of patients with heart failure

ESC Intervention	Modified Intervention Based on Thematic Analysis	Justification for Modification
Continuous Walking for 20–30 minutes	Guided Walking Program (Shorter, Nurse-Assisted, Gradually Progressing)	Patients reported exhaustion, so sessions are divided into smaller intervals.
Resistance Training (Leg & Arm Strengthening)	Seated Resistance Training with Resistance Bands	Nurses observed leg weakness, and patients prefer seated exercises first.
Functional Task Training (Sit-to-Stand, Stair Climbing)	Functional Mobility Training (Bedside to Chair Transfer, Balance Drills)	Patients expressed fear of falling; nurses recommend gradual functional movements first.
Breathing Exercises (Pursed-Lip, Diaphragmatic Breathing)	Pre-Mobilization Breathing & Relaxation	Patients and professionals agreed that breathing exercises reduce dyspnea and anxiety before mobilization.
30–45 Minute Sessions	10–15 Minute Intervals with Rest Breaks	Patients reported fatigue; professionals suggested shorter, manageable durations.
Nurse-Led Education on Mobilization	Motivational Coaching & Symptom-Based Adjustments	Patients reported low motivation; nurses recommend personalized coaching.

DISCUSSION

This study aimed to Adapt Nursing Intervention to Improve Heart Failure Patients' Outcomes. This present study focused on patients and healthcare professional's perspectives regarding mobilization interventions for inpatients in terms of the FITT (Frequency, Intensity, Time, and Type) framework. Key themes from both groups were identified through the thematic analysis of the strategies that would optimize FITT components, challenges in implementation, and perceived benefits from a nurse led intervention. The results have been used to inform the modifications of the European Society of Cardiology (ESC) evidence-based interventions to make them more applicable clinically. The implications of these findings are integrated with existing literature in a discussion.

Patients agreed on the benefits of mobilization, but additionally were concerned about fatigue, dizziness and pain. Previous studies have found that early mobilization reduces hospital acquired complications but this need be done with careful regard to patient tolerance.¹⁹ Additionally, previous research has highlighted the value of gradual mobilization progression in order to avoid the adverse effects.²⁰ Consequently the modified interventions consist of individualized mobilization plans with the shorter initial session and slow progression of the length and intensity.

Mobilization was officially recognized by patients and healthcare professionals as an important variable in recovery: promoting autonomy and decreasing the incidence of deep vein thrombosis, and muscle deconditioning. The current findings are supported by

the existing literature which highlight the importance of early mobilization of the heart failure patients and which are licking with the minimum hospital stay.²¹

Physical limitations, fear of falls and lack of adequate staffing to support mobilization efforts were the main challenges in mobilization. These areas of concern are consistent with existing literature which elucidates studies of similar barriers in acute care settings. ²² Therefore, the modified interventions include nurse-led structured mobilization programs, gradually and supervised. The idea that structured multidisciplinary interventions can help overcome barriers to mobilization is supported by research performed by Fordyce et al.²³

Healthcare professionals called for optimizing of FITT components in which interventions were tailored to the individual patient needs. There is existing literature that recommends that personalization of mobilization programs leads to better adherence and improved outcomes.²⁴ Standardized mobilization protocols are recommended by the ESC guidelines, but the modified protocols offer patient centered flexibility with varying frequencies, intensities and types of mobilization activities according to patient feedback and the clinical status.

Health care professionals and patients endorsed the integration of a nurse led mobilization program. There is literature supporting that nurse led programs are effective in improving patient engagement and functional outcome.^{25–28} With the modified interventions, the role of nurses is expanded, including education and motivation, patient adherence and addressing the patient's concern in mobilization.

However, gaps in current mobilization practices were identified by healthcare professionals, including inconsistent implementation and no structure of protocols. Such concerns were also reported in studies, which further suggest that while clear guidelines and staff training are crucial for effective mobilization programs, the balancing of adequacy, alignment, demand, and strength is necessary in risk communication practices.^{29,30} It is evidence based that the modified interventions fit in this because they provide structured nurse led protocols, staff training sessions and regular monitoring of patient progress.

CONCLUSION

The findings of this study supported a modification of FITT based (Frequency, Intensity, Time, and Type) mobilization strategies in accordance with the patient needs and towards profession insight at both patient and healthcare professional level. Key challenges, perceived benefits and practical considerations of mobilization programs were presented as themes through thematic analysis. The study proposed evidence based modifications adapted for the use of the ADAPT-ITT framework to improve patient engagement, feasibility and outcomes based on the European Society of Cardiology (ESC) guidelines. Findings suggest that that individualized mobilization programs based on patient preferences, fatigue and clinical conditions, as well as nurse led structured and for safety. In addition, healthcare professionals raised the value of interdisciplinary teamwork and addressing barriers, such as resource constraints and individual patient compliance.

REFERENCES

- Schwinger RHG. Pathophysiology of heart failure. *Cardiovasc Diagn Ther.* 2021;11(1):263.
- Savarese G, Becher PM, Lund LH, Seferovic P, Rosano GMC, Coats AJS. Global burden of heart failure: a comprehensive and updated review of epidemiology. *Cardiovasc Res.* 2022;118(17):3272–87.
- Yan T, Zhu S, Yin X, Xie C, Xue J, Zhu M, et al. Burden, trends, and inequalities of heart failure globally, 1990 to 2019: a secondary analysis based on the global burden of disease 2019 study. *J Am Heart Assoc.* 2023;12(6):e027852.
- Funato Y, Kono Y, Kawai H, Hoshino M, Yamada A, Muramatsu T, et al. The acute-phase ambulation program improves clinical outcome for acute heart failure. *J Cardiovasc Dev Dis.* 2022;9(10):314.
- Benjamin EJ, Virani SS, Callaway CW, Chang AR, Cheng S, Chiuve SE, et al. Heart Disease and Stroke Statistics—2018 Update: A Report From the American Heart Association. *Circulation.* 2018. CIR.0000000000000558.
- Members: AF, McDonagh TA, Metra M, Adamo M, Gardner RS, Baumbach A, et al. 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: Developed by the Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC). With the special contributi. *Eur J Heart Fail.* 2022;24(1):4–131.
- Groenewegen A, Rutten FH, Mosterd A, Hoes AW. Epidemiology of heart failure. *Eur J Heart Fail.* 2020;22(8):1342–56.
- Shahim B, Kapelios CJ, Savarese G, Lund LH. Global public health burden of heart failure: an updated review. *Card Fail Rev.* 2023;9.
- Azimzadeh D. Nurses' perceptions of family involvement in delirium assessment, prevention and management in postoperative cardiac surgery patients. *J Compil Adv Nurs.* 2024;2(21):191–201.
- Brennan K, Sanchez D, Hedges S, Lynch J, Hou YC, Al Sayfe M, et al. A nurse-led intervention to reduce the incidence and duration of delirium among adults admitted to intensive care: A stepped-wedge cluster randomised trial. *Aust Crit Care.* 2023;36(4):441–8.
- Jaarsma T, Hill L, Bayes-Genis A, La Rocca HB, Castiello T, Čelutkienė J, et al. Self-care of heart failure patients: practical management recommendations from the Heart Failure Association of the European Society of Cardiology. *Eur J Heart Fail.* 2021;23(1):157–74.
- Borlaug BA. Evaluation and management of heart failure with preserved ejection fraction. *Nat Rev Cardiol.* 2020;17(9):559–73.
- Metra M, Tomasoni D, Adamo M, Bayes-Genis A, Filippatos G, Abdelhamid M, et al. Worsening of chronic heart failure: definition, epidemiology, management and prevention. A clinical consensus statement by the Heart Failure Association of the European Society of Cardiology. *Eur J Heart Fail.* 2023;25(6):776–91.
- Son YJ, Choi J, Lee HJ. Effectiveness of nurse-led heart failure self-care education on health outcomes of heart failure patients: a systematic review and meta-analysis. *Int J Environ Res Public Health.* 2020;17(18):6559.
- Malara RT, Syarul S. Effect of nurse-led educational interventions on self-care of adult patients with heart failure: A systematic review. *J Keperawatan.* 2020;10(2):130–8.
- Dionne-Odom JN, Ejem DB, Wells R, Azuero A, Stockdill ML, Keebler K, et al. Effects of a telehealth early palliative care intervention for family caregivers of persons with advanced heart failure: the ENABLE CHF-PC randomized clinical trial. *JAMA Netw open.* 2020;3(4):e202583–e202583.
- Allida S, Du H, Xu X, Prichard R, Chang S, Hickman LD, et al. mHealth education interventions in heart failure. *Cochrane Database Syst Rev.* 2020;(7).
- Pelliccia A, Sharma S, Gati S, Bäck M, Börjesson M, Caselli S, et al. 2020 ESC Guidelines on sports cardiology and exercise in patients with cardiovascular disease. *Eur Heart J.* 2021 Jan;42(1):17–96.
- Kakutani N, Fukushima A, Kinugawa S, Yokota T, Oikawa T, Nishikawa M, et al. Progressive mobilization program for patients with acute heart failure reduces hospital stay and improves clinical outcome. *Circ Reports.* 2019;1(3):123–30.

20. Cortes OL, Delgado S, Esparza M. Systematic review and meta-analysis of experimental studies: In-hospital mobilization for patients admitted for medical treatment. *J Adv Nurs.* 2019;75(9):1823–37.
21. Nirmalasari N, Mardiyono M, Dharmana E, Arifin T. Deep breathing exercise and active range of motion influence physiological response of congestive heart failure patients. *Indian J Appl Res.* 2020;5:123–35.
22. Vitomskyi V V, Lazarev OB, Doroshenko EY, Vitomska M V, Kovalenko TM, Hertsyk AM, et al. The impact of mobilization protocols on the length of postoperative hospitalization among cardiac surgery patients. *Interdiscip Rehabil Interdiscip.* 2021;(3):353–265.
23. Fordyce CB, Katz JN, Alviar CL, Arslanian-Engoren C, Bohula EA, Geller BJ, et al. Prevention of complications in the cardiac intensive care unit: a scientific statement from the American Heart Association. *Circulation.* 2020;142(22):e379–406.
24. Lopes I, Delgado B, Costa P, Padilha JM. Aerobic and resistance exercise in heart failure inpatients: a scoping review. *Heart Fail Rev.* 2023;28(5):1077–89.
25. Mares MA, McNally S, Fernandez RS. Effectiveness of nurse-led cardiac rehabilitation programs following coronary artery bypass graft surgery: a systematic review. *JBIC Evid Synth.* 2018;16(12):2304–29.
26. Nydahl P, Sricharoenchai T, Chandra S, Kundt FS, Huang M, Fischill M, et al. Safety of patient mobilization and rehabilitation in the intensive care unit. Systematic review with meta-analysis. *Ann Am Thorac Soc.* 2017;14(5):766–77.
27. Son HM, Lee H. Association Between Nurse-Led Multidisciplinary Education and Cardiac Events in Patients With Heart Failure: A Retrospective Chart Review. *Asian Nurs Res (Korean Soc Nurs Sci).* 2024;18(1):60–7.
28. Stollendorf DP, Dietrich MS, Chidume T, McIntosh M, Maxwell CA. Nurse-initiated mobilization practices in 2 community intensive care units: a pilot study. *Dimens Crit Care Nurs.* 2018;37(6):318–23.
29. Munir H, Fromowitz J, Goldfarb M. Early mobilization post-myocardial infarction: A scoping review. *PLoS One.* 2020;15(8):e0237866.
30. Köse S, Avşar G. Impact of early and regular mobilization on vital signs and oxygen saturation in patients undergoing open-heart surgery. *Brazilian J Cardiovasc Surg.* 2021;36(4):506–14.