Title: Health Education to Improve the Quality of Life for Coronary Heart Disease Patients: A Scoping Review

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Abstract:

Background: Coronary heart disease (CHD) is a leading cause of death and disability worldwide. Quality of life in CHD patients depends on effective disease management and serves as an indicator of management effectiveness and impact on daily living. Health education is crucial for enhancing CHD patients' quality of life. This scoping review mapped health education methods for improving quality of life in CHD patients, as well as benefits, barriers, and implementation challenges.

Methods: This review followed PRISMA Extension for Scoping Reviews (PRISMA-ScR) guidelines and Arksey and O'Malley's (2005) framework. Literature searches were conducted across nine databases: PubMed, Scopus, Cochrane Library, ProQuest, Global Index Medicus, Ebsco, ScienceDirect, Sage, and Garuda. Inclusion criteria were accessible full-text experimental research articles in English and Indonesian published 2014-2024. Excluded were reviews, non-English/Indonesian articles, inaccessible full-texts, protocols, and non-peer-reviewed articles. Selection used Rayyan software and quality was assessed using Joanna Briggs Institute (JBI) critical appraisal checklist. Three reviewers conducted selection, with data mapped, categorized, and summarized using thematic synthesis with explorative, descriptive approach.

Results: Twenty articles were included. Media and technology-based health education, plus individual, group, and community-based approaches, significantly improved knowledge, quality of life, behavior change, and self-care skills in CHD patients. Major barriers included limited technology access, variations in patient understanding, resource limitations, and motivation issues.

Conclusion: This scoping review provides comprehensive overview of health education strategies for improving CHD patients' quality of life and establishes foundation for developing more effective future health education programs.

Keywords: Health education, Quality of life, Coronary disease, Scoping review, Disease management

Highlights

- Media and technology-based health education, along with individual, group, and community-based approaches, significantly improved knowledge, quality of life, and self-care skills in CHD patients
- Major implementation barriers include limited technology access (13 articles), variations in patient understanding (12 articles), resource limitations (10 articles), and motivation issues (8 articles)
- Health education interventions resulted in improved quality of life (20 articles), behavior change (10 articles), and enhanced self-care skills (6 articles) among CHD patients

Plain Language Summary

This review explored various health education methods used to improve the quality of life of patients with coronary heart disease. Twenty studies were analyzed, showing that technology-based education (such as WeChat and mobile apps) and group-based programs effectively increased patient knowledge and quality of life. The main benefits included better understanding of their condition, healthier behaviors, and improved daily functioning. However, challenges remain, including difficulty accessing technology, differences in patients' ability to understand health information, and limited healthcare resources. These findings can help healthcare providers design better education programs that address these barriers and support CHD patients more effectively.

Introduction

Coronary heart disease (CHD) is one of the leading causes of death and disability worldwide. CHD occurs when the coronary arteries, which supply oxygen-rich blood to the myocardium, become narrowed or blocked. This condition can lead to complications such as angina, heart attacks, heart failure, and other issues, all of which can affect the quality of life of patients (Virani et al., 2020). According to the World Health Organization (WHO, 2018), cardiovascular diseases, including CHD, account for approximately 17.9 million deaths annually worldwide. The American Heart Association (AHA) reported that in 2023, 16 million adults in the United States were living with coronary heart disease (Virani et al., 2023). The prevalence of CHD continues to increase globally due to lifestyle changes and modifiable risk factors.

Quality of life of patients suffering from coronary heart disease (CHD) heavily relies on the ability to manage the disease effectively. The quality of life in CHD patients indicates the effectiveness of disease management and its impact on their daily lives. According to the World Health Organization, quality of life can be defined as an individual's perception of their position in life, goals, expectations, and living standards in relation to their cultural and value systems (WHO, 2018). CHD often diminishes patients' quality of life and can lead to psychological disturbances such as depression and anxiety, further reducing their quality of life (Xu et al., 2016). Symptoms like chest pain, shortness of breath, and fatigue can interfere with daily activities and physical functioning (Ali-Faisal et al., 2016). By understanding the impact of CHD on quality of life, the management of CHD can become more comprehensive and patient-centered, ultimately improving overall care outcomes.

Health education plays a crucial role in the management of chronic diseases, particularly in improving the quality of life for patients CHD. As described by Bastable (2023), patient education is the process of helping patients integrate health-related actions into their daily lives to achieve optimal health. The primary goal is to enhance patients' knowledge about their condition and improve their overall quality of life. Previous research has shown that patient education programs can significantly increase knowledge, promote healthier behaviors, and improve the quality of life for CHD patients. This has been demonstrated in a meta-analysis by Ghisi *et al.*, (2014), and a study by Lau-Walker et al. (2016). However, several challenges exist in implementing effective health education, such as using information and communication technologies (Coorey et al., 2018). These challenges highlight both the potential and concerns regarding the effectiveness of digital methods compared to traditional approaches in delivering health education.

Integrating health education into existing healthcare systems presents its own set of challenges, particularly due to limited time and resources in clinical settings (Svavarsdóttir, et al., 2015). Innovative and efficient approaches are necessary to address these issues and maximize the impact of health education on the quality of life of patients with CHD. In recent years, various new models and strategies for health education targeting CHD patients have emerged. These include technology-based approaches, such as e-learning platforms and mobile applications, which enhance personalization and accessibility, as well as community-based education models and peer support initiatives that strengthen patient support and complement clinical care (Widmer et al., 2016).

Despite the advancements in health education for CHD patients, several critical questions still need to be answered, such as how to further improve patients' quality of life, tailor programs to individual needs, and effectively leverage technology. Additionally, local and cultural elements must also be considered, such as traditional beliefs, language diversity, and access to healthcare services (Maharani & Tampubolon, 2014). This scoping review aims to explore the various health education methods that have been implemented, the benefits of health education, and the barriers and challenges in its execution to improve the quality of life for CHD patients. The results of this scoping review are expected to provide a clearer understanding of the current state of the art in health education for enhancing the quality of life in CHD patients. Additionally, it aims to deepen our understanding of the role of health education, inform better policy-making and clinical practices, and guide future research on how health education can optimally impact the quality of life for CHD patients.

Materials and Methods

The Preferred Reporting Items for Systematic Reviews and Meta-Analysis Extension for Scoping Reviews (PRISMA-SCR) were used to optimize reporting and enhance accuracy. PRISMA-SCR also provides optional reporting items tailored explicitly for systematic reviews and meta-analysis extensions that are unique to scoping reviews (Tricco et al., 2018). The protocol for this study has been registered with the Open Science Framework (https://osf.io/s4nvk/). This research follows the five stages of the Scoping Review Framework (Arksey & O'Malley, 2005):

Stage 1: Research Question

This scoping review's research question is: What has been done in the field of health education to improve the quality of life of patients with CHD?

Stage 2: Relevant Studies and Search Terms

Drawing from the existing scientific literature, this review explores the role of health education in enhancing the quality of life for CHD patients. The study will outline the characteristics of relevant studies, the specific elements of health education provided, and the effects of health education on the quality of life of CHD patients. The review utilizes nine global databases: PubMed, Scopus, Cochrane Library, ProQuest, Global Index Medicus, Ebsco, ScienceDirect, Sage, and one Indonesian database (Garuda). An initial search was conducted to identify titles, abstracts, and content in order to pinpoint relevant terms and keywords (Table 1).

Table 1. Keywords for Database Search

No	Database	Keywords	Articles	Access Date
1	PubMed	(Coronary heart disease OR coronary artery disease OR ischemic heart disease OR atherosclerotic heart disease) AND (health education OR patient education OR wellness education OR health promotion)) AND (quality of life OR standard of living OR standard health) **Filters:** Free full text, Full text, in the last 10 years, Humans, English	1390	12/06/2024
2	Scopus	(Coronary heart disease OR coronary artery disease OR ischemic heart disease AND health education OR patient education AND quality of life OR standard of living OR standard health)	88	11/06/2024
3	Cochrane library	(Coronary heart disease OR coronary artery disease OR ischemic heart disease AND health education OR patient education OR health promotion AND quality of life OR standard of living)	28	11/06/2024
4	ProQuest	(Coronary heart disease OR coronary artery disease OR ischemic heart disease AND	347	12/06/2024

		health education OR patient education OR health promotion AND quality of life OR standard of living)		
5	Global Index Medicus	(Coronary heart disease OR coronary artery disease OR ischemic heart disease OR atherosclerotic heart disease AND health education OR patient education OR health promotion AND quality of life OR standard of living OR standard health)	4	11/06/2024
6	Ebsco	(Coronary heart disease OR coronary artery disease OR ischemic heart disease AND health education OR patient education OR wellness education AND quality of life OR standard of living OR standard health)	5	11/06/2024
7	Science Direct	(Coronary heart disease OR coronary artery disease OR ischemic heart disease AND health education OR patient education OR health promotion AND quality of life OR standard of living)	86	11/06/2024
8	Sage	(Coronary heart disease OR coronary artery disease OR ischemic heart disease AND health education OR patient education OR health promotion AND quality of life OR standard of living)	24	11/06/2024
9	Garuda	(Pendidikan Kesehatan AND Penyakit Jantung)	3	12/06/2024

The inclusion and exclusion criteria for the review are based on the Population, Concept, and Context (PCC) framework and are listed in Table 2.

Inclusion criteria:

- Full-text articles published in English and Indonesian
- Published between 2014-2024
- Research articles with experimental designs (RCTs, quasi-experimental studies)

- Studies involving patients with coronary heart disease
- Studies examining health education interventions
- Studies measuring quality of life outcomes

Exclusion criteria:

- Secondary research (systematic reviews, meta-analyses, scoping reviews)
- Articles not in English or Indonesian
- Inaccessible full-text articles
- Study protocols
- Non-peer-reviewed articles
- Conference abstracts without full papers

The definition of coronary heart disease (CHD) was derived from definitions found in the original qualitative and quantitative studies that included the data.

Table 2. PCC Research Question Framework

Criteria	Inclusion	Keyword
Population	Patients with Coronary Heart Disease	Coronary heart disease OR coronary artery disease OR ischemic heart disease
Concept	Health Education	health education OR patient education
Context	Quality of Life	quality of life OR standard of living OR standard health

Stage 3: Study Selection

Study Extraction from Databases

Figure 1 illustrates the process, screening results, and manuscript extraction criteria following the initial search based on the inclusion and exclusion criteria of the study. In summary, from nine databases, 1,975 relevant articles were collected. After removing duplicate articles, 1,895 articles remained. The titles were then screened for relevance, resulting in 44 articles for further screening, followed by a full-text review and study abstraction. A third-stage search was also conducted by screening the reference lists of the selected articles through full-text reading, yielding an additional 25 articles. Subsequently, articles not relevant to CHD were not related to health education, did not address quality of life, or were literature reviews were excluded. This selection process resulted in the final inclusion of 20 primary research studies for analysis (Figure 1).

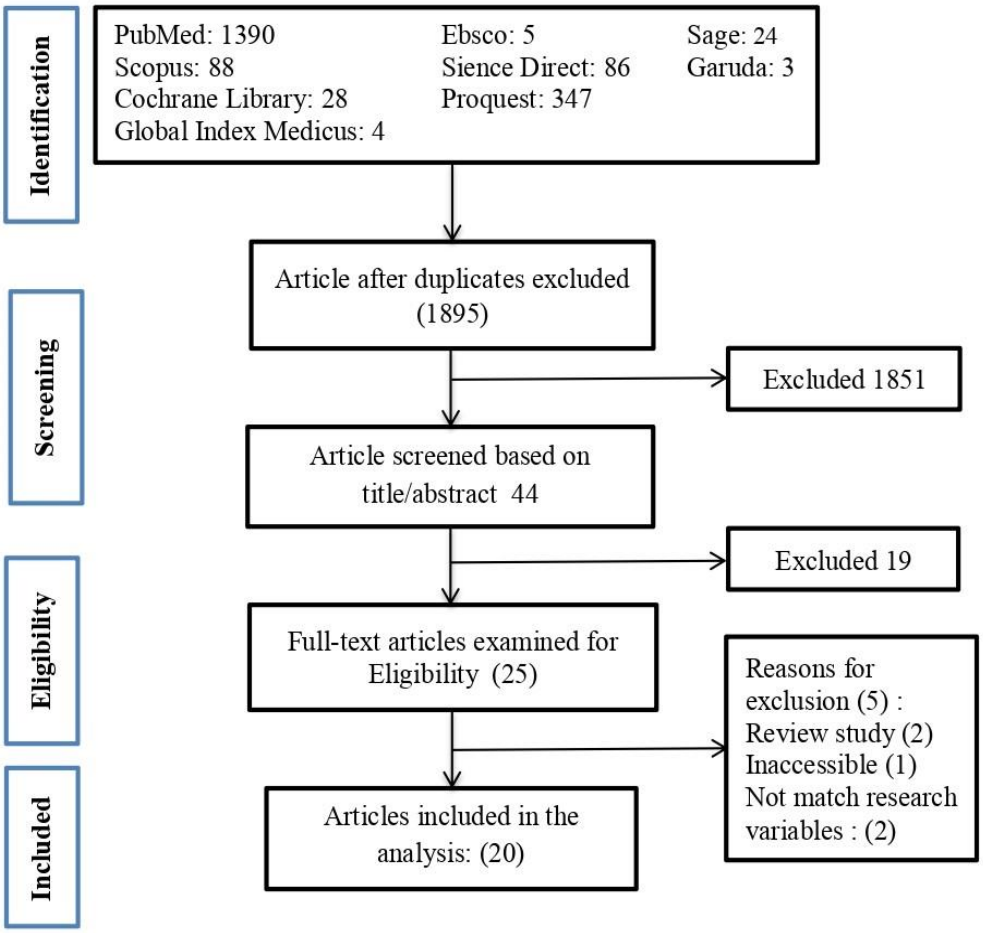

Figure 1. PRISMA-ScR Flow Diagram (Tricco et al., 2018)

Reliability of Study Extraction

All abstracts identified from the article search were imported into the Mendeley reference management software. After removing duplicates, the abstracts were exported to the Rayyan software program (Ouzzani et al., 2016). To ensure the reliability of reviewer assessments of the screened articles using the inclusion and exclusion criteria, two reviewers (RS and SM) randomly selected 20 English-language articles. This selection was performed to sample titles, abstracts, and full texts using the Joanna Briggs Institute (JBI) manual for evidence synthesis (Peters et al., 2020). Disagreements were found in 5% of the articles, resolved through discussion between reviewers until full agreement was reached at each sampling stage.

Stage 4: Data Extraction

Data were extracted to include essential information, covering study location, study design, objectives, sample, and key findings (Table 3).

Stage 5: Thematic Summary and Key Findings

To identify the main themes, an inductive thematic analysis method based on Braun and Clarke (2006), work was employed. This process began with an in-depth examination of each research finding, resulting in initial codes. These codes were then refined through an iterative process to produce the final themes presented in this paper ultimately.

Study Characteristics

The twenty articles reviewed were mainly conducted in China, with six articles (33%) (Cao et al., 2023; Duan et al., 2018; Gu & Zhu, 2023; Huang et al., 2017; Ma et al., 2021; Su & Yu, 2019). Four articles were from Iran (Ebrahimi et al., 2021; Fayazi et al., 2020; Mohammadi et al., 2021; Valiee et al., 2017) two from Taiwan (Hong et al., 2021; Shan et al., 2020), two from Singapore (Wang et al., 2018; Zhang et al., 2017), two from Brazil (Arantes et al., 2018; Pitta et al., 2022), one from Turkey (Özdemir & Önler, 2021), one from Germany (Melamed et al., 2014), one from Australia (Ellis et al., 2023), and one from Indonesia (Cahyaningrat, 2020). All twenty studies utilized quantitative design. Nineteen studies employed randomized controlled trial (RCT) designs, while one study (Cahyaningrat, 2020) used a quasi-experimental design with pre-posttest on one group.

Results

Types of Health Education:

The research findings indicate that the majority of the analyzed articles did not employ the same health education approach, suggesting that the application of health education remains limited to technological trends and individual and community-focused approaches. The review of articles reveals that the most frequently reported type of health education is media and technology-based health education, with 13 articles addressing this approach (Arantes et al., 2018; Cao et al., 2023; Ebrahimi et al., 2021; Ellis et al., 2023; Fayazi et al., 2020; Gu & Zhu, 2023; Hong et al., 2021; Ma et al., 2021; Mohammadi et al., 2021; Pitta et al., 2022; Su & Yu, 2019; Valiee et al., 2017; Wang et al., 2018). Other types of health education, such as individual, group, and community-based education, were covered in nine articles (Arantes et al., 2018; Ebrahimi et al., 2021; Fayazi et al., 2020; Hong et al., 2021; Huang et al., 2017; Melamed et al., 2014; Pitta et al., 2022; Valiee et al., 2017; Wang et al., 2018). Additionally, several articles described structured health education, with five articles focusing on this type (Arantes et al., 2018; Cahyaningrat, 2020; Cao et al., 2023; Özdemir

& Önler, 2021; Shan et al., 2020), while skill-based or training-focused health education appeared in four articles (Fayazi et al., 2020; Ma et al., 2021; Melamed et al., 2014; Su & Yu, 2019), school-based health education was represented in two articles (Hong et al., 2021; Valiee et al., 2017), and formal, non-formal, and informal health education was covered in two articles (Duan et al., 2018; Zhang et al., 2017), hospital-based health education was discussed in one article (Wang et al., 2018), and culture-based health education was also addressed in one article (Su & Yu, 2019).

The two most frequently researched types of health education are media and technology-based education and education focusing on individuals, groups, and communities. This indicates a trend towards using technology for disseminating health information and highlights the importance of individual and community-focused approaches. However, other types of health education remain important in specific contexts, such as school-based education for children and adolescents or culture-based education for communities with specific cultural beliefs.

Benefits of Health Education:

The review of the analyzed articles reveals that the most frequently reported benefit of health education is the improvement in knowledge and quality of life, as highlighted in 20 articles (Arantes et al., 2018; Cahyaningrat, 2020; Cao et al., 2023; Duan et al., 2018; Ebrahimi et al., 2021; Ellis et al., 2023; Fayazi et al., 2020; Gu & Zhu, 2023; Hong et al., 2021; Huang et al., 2017; Ma et al., 2021; Melamed et al., 2014; Mohammadi et al., 2021; Özdemir & Önler, 2021; Pitta et al., 2022; Shan et al., 2020; Su & Yu, 2019; Valiee et al., 2017; Wang et al., 2018; Zhang et al., 2017). Other notable benefits include behavior change, reported in 10 articles (Cahyaningrat, 2020; Cao et al., 2023; Duan et al., 2018; Hong et al., 2021; Huang et al., 2017; Melamed et al., 2014; Su & Yu, 2019; Valiee et al., 2017; Wang et al., 2018; Zhang et al., 2017), and enhanced self-care skills, mentioned in six articles (Arantes et al., 2018; Ebrahimi et al., 2021; Fayazi et al., 2020; Hong et al., 2021; Mohammadi et al., 2021; Wang et al., 2018), patient empowerment was noted in six articles (Cahyaningrat, 2020; Ebrahimi et al., 2021; Ellis et al., 2023; Fayazi et al., 2020; Hong et al., 2021; Su & Yu, 2019), while reduced visit rates/re-admissions were covered in five articles (Arantes et al., 2018; Ebrahimi et al., 2021; Ellis et al., 2023; Pitta et al., 2022; Shan et al., 2020), anxiety reduction was reported in five articles (Fayazi et al., 2020; Mohammadi et al., 2021; Özdemir & Önler, 2021; Pitta et al., 2022; Valiee et al., 2017), social support in five articles (Gu & Zhu, 2023; Huang et al., 2017; Melamed et al., 2014; Shan et al., 2020; Su & Yu, 2019), and cost reduction in four articles (Fayazi et al., 2020; Hong et al., 2021;

Valiee et al., 2017; Zhang et al., 2017), emotional support appeared in three articles (Arantes et al., 2018; Ebrahimi et al., 2021; Ma et al., 2021), medication adherence in three articles (Ellis et al., 2023; Mohammadi et al., 2021; Shan et al., 2020), and improved psychological health in two articles (Cao et al., 2023; Wang et al., 2018), Increased self-efficacy was noted in two articles (Özdemir & Önler, 2021; Pitta et al., 2022), community empowerment in two articles (Duan et al., 2018; Valiee et al., 2017), physical rehabilitation in two articles (Duan et al., 2018; Gu & Zhu, 2023), and disease prevention benefits in one article (Hong et al., 2021).

Health education offers numerous benefits, but the two most frequently reported across various studies are improvements in knowledge and quality of life, as well as behavior change. This suggests that health education not only provides information but also encourages positive changes in lifestyle and health behavior. Additionally, health education can enhance the overall efficiency of the healthcare system, as evidenced by reductions in hospital visit rates, patient empowerment, and healthcare costs.

Barriers and Challenges:

The review of the analyzed articles reveals that the most common barriers and challenges in implementing health education are limited access to technology, reported in 13 articles (Arantes et al., 2018; Duan et al., 2018; Ellis et al., 2023; Fayazi et al., 2020; Gu & Zhu, 2023; Ma et al., 2021; Melamed et al., 2014; Pitta et al., 2022; Shan et al., 2020; Su & Yu, 2019; Valiee et al., 2017; Wang et al., 2018; Zhang et al., 2017), other significant challenges include variation in patient understanding, noted in 12 articles (Arantes et al., 2018; Cahyaningrat, 2020; Duan et al., 2018; Ebrahimi et al., 2021; Ellis et al., 2023; Fayazi et al., 2020; Gu & Zhu, 2023; Ma et al., 2021; Melamed et al., 2014; Özdemir & Önler, 2021; Shan et al., 2020; Zhang et al., 2017), and resource limitations, mentioned in 10 articles (Arantes et al., 2018; Duan et al., 2018; Ebrahimi et al., 2021; Fayazi et al., 2020; Hong et al., 2021; Özdemir & Önler, 2021; Pitta et al., 2022; Shan et al., 2020; Valiee et al., 2017; Wang et al., 2018), motivation and patient adherence were identified as challenges in eight articles (Cahyaningrat, 2020; Ellis et al., 2023; Gu & Zhu, 2023; Melamed et al., 2014; Özdemir & Önler, 2021; Pitta et al., 2022; Su & Yu, 2019; Zhang et al., 2017), while time constraints were discussed in six articles (Cahyaningrat, 2020; Ebrahimi et al., 2021; Ellis et al., 2023; Melamed et al., 2014; Mohammadi et al., 2021; Özdemir & Önler, 2021), low literacy levels were highlighted in five articles (Cao et al., 2023; Ellis et al., 2023; Gu & Zhu, 2023; Su & Yu, 2019; Valiee et al., 2017), and social stigma appeared in five articles (Ebrahimi et al., 2021; Hong et al., 2021; Huang et al., 2017; Melamed et al., 2014; Su & Yu, 2019). Cultural

and language differences were mentioned in four articles (Hong et al., 2021; Huang et al., 2017; Su & Yu, 2019; Valiee et al., 2017), and anxiety and depression were noted in three articles (Cao et al., 2023; Ma et al., 2021; Özdemir & Önler, 2021).

In the future, enhancing the effectiveness of health education programs will depend on addressing these challenges, particularly those related to health literacy and technology access. Tackling these issues will require a broad and flexible approach, including the improvement of technological infrastructure, the creation of educational materials that accommodate varying literacy levels, and strategies that are sensitive to language and cultural differences.

Discussion

This review aimed to map various types of health education that can be provided to CHD patients to enhance their quality of life. The findings reveal that individual, group, and community-focused education, as well as media and technology-based education, are currently dominant. This trend reflects the increasing use of digital technology in effectively disseminating health information, as evidenced by programs such as those based on WeChat (Gu & Zhu, 2023). Furthermore, health education that considers cultural and social factors is becoming increasingly important (Su & Yu, 2019). These approaches are supported by multimedia learning theory (Mayer, 2002) and social learning theory (Bandura, 1971). Despite the dominance of technology, it is crucial to balance technological approaches with individual-focused methods to address the diverse needs of CHD patients.

The review findings indicate that health education offers numerous benefits for patients with CHD. The primary benefits highlighted across all articles are improved knowledge and quality of life, suggesting that health education helps patients understand their condition and enhances their overall well-being. Additionally, many reports describe positive behavior changes, indicating that education effectively promotes healthy lifestyles and adherence to medical advice. Enhanced self-care skills, patient empowerment, and reduced hospital readmissions are also notable benefits. These outcomes have the potential to improve patient self-management and alleviate the burden on the healthcare system. Advanced technologies, such as avatar-based applications and multimedia education, have shown positive results in enhancing knowledge, quality of life, medication adherence, and reducing cardiac anxiety (Ellis et al., 2023). These findings align with the Health Belief Model (Rosenstock et al., 1988) and the Health-Related Quality of Life (HRQoL) concept established by the World Health Organization (WHO), which emphasizes the importance of patient-centered approaches in managing CHD (WHO, 2018).

Health education for patients with CHD faces several significant challenges, particularly limitations in technology access and variations in patient understanding. This highlights the need for improved access and digital literacy, as well as methods tailored to individual health literacy levels. Some researchers have proposed solutions, including hybrid methods that combine face-to-face support with self-managed programs (Wang et al., 2018), and diversified, step-by-step health education for older patients (Shan et al., 2020). Concepts such as the digital divide (Van Dijk, 2020), and health literacy theory (Nutbeam, 2006) are relevant here. Addressing these issues requires a holistic approach that includes developing educational materials suited to various literacy levels, enhancing technological infrastructure, and optimizing resource allocation. Continuous innovation in CHD management is crucial, including advancing health policies and properly managing resources. Further research is needed to improve patient outcomes and overall healthcare system efficiency.

Limitations

This scoping review has several limitations that should be acknowledged. First, the search was limited to articles published in English and Indonesian, which may have excluded relevant studies in other languages. Second, the review focused exclusively on experimental studies (primarily RCTs), potentially missing valuable insights from qualitative or mixed-methods research. Third, the heterogeneity of interventions and outcome measures across studies made it challenging to draw direct comparisons. Fourth, most included studies were conducted in high- and middle-income countries, which may limit the generalizability of findings to low-resource settings. Finally, the quality of the included studies varied, and some had small sample sizes or short follow-up periods, which may affect the robustness of the conclusions.

Conclusion

In the treatment of CHD, personalized approaches and the use of digital technology have emerged as major trends. Research indicates that these educational interventions improve patient understanding, quality of life, and the adoption of healthier lifestyles. However, several challenges still hinder their implementation. The most prominent issues include resource limitations, variations in patient health literacy, and accessibility of technology. More flexible and inclusive strategies are needed to address these problems. Hybrid methods that combine digital and conventional techniques can help bridge the access gap. To ensure program success, educational content must be tailored to different levels of patient

understanding. Additionally, enhancing healthcare professionals' ability to use technology effectively and communicate well is a top priority.

Ethical Considerations

Complying with ethical guidelines

This study was exempt from review by the Institutional Review Board for Human Subjects (IRB) because only de-identified data were disclosed in the reviewed articles.

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Table 3. Articles Exploring the Role of Health Education: Findings

Author, Year, and Country	Research Objective	Research Design (Sample Size)	Type of Health Education	Benefits of Health Education	Barriers and Challenges
Xi Cao, Sek Ying Chair, Eliza M. L. Wong, Mei Yi Tao, 2023, China	Evaluate the effectiveness of educational interventions in improving psychological health, health-supportive behaviours, and various domains of quality of life in patients with coronary heart disease (CHD).	Randomized controlled trial (128 CHD patients, 64 per group)	Education intervention consisted of two face-to-face sessions in the hospital and six follow-up sessions via phone after discharge.	- Enhanced Quality of Life - Improved Psychological Health - Supportive Health Behaviors - Increased Disease Knowledge	- Negative Perceptions of Disease - Anxiety and Depression - Limitations in Adopting Healthy Behaviors - Lack of Social Support - Difficulty in Stress Management
Yan Ping Duan et al., 2018, China	To gain insights into an 8-week web-based health promotion intervention for cardiac rehabilitation patients post-hospital discharge.	Randomized controlled trial (114 patients)	- Formal Education - Informal Education - Community-Based Education - Media-Based Education	- Improved Quality of Life - Increased Knowledge - Behavior Change - Enhanced Public Awareness - Supported Rehabilitation	- Technology Access Issues - Limited Digital Literacy - Motivation and Engagement - Variability in Patient Response - Resource Limitations
Arantes et al., 2018. Brazil	To evaluate the long-term outcomes of an educational program compared to usual care in patients undergoing percutaneous coronary intervention (PCI)	Longitudinal observational study (56 participants: 29 intervention group, 27 control group)	- Individual Education - Group-Based Education - Community-Based Education - Media-Based Education - Continuous Education	- Improved Quality of Life - Increased Knowledge - Reduced Rehospitalization Rates - Enhanced Self-Care Skills - Awareness of Warning Signs - Emotional Support	- Resource Limitations - Educational Variability - Access Issues - Resistance to Change - Lack of Ongoing Support - Inadequate Evaluation
Neda Fayazi, Vahid Naseri Salahshour, Mahmood Karimy, Homa Fayazi, 2020. Iran	To improve the quality of life in patients with acute coronary syndrome through a structured educational intervention	Randomized controlled trial (70 coronary artery disease patients, divided into intervention (n=35) and control (n=35) groups)	- Individual Education - Group Education - Media-Based Education - Online Education - Skills Training	- Enhanced Quality of Life - Increased Knowledge - Improved Self-Care Skills - Reduced Anxiety - Reduced Healthcare Costs - Encouraged Patient Participation	- Lack of Resources - Patient Resistance - Access Limitations - Variation in Understanding Levels - Emotional and Psychological Burden.

Valiee S, Razavi NS, Aghajani M, Bashiri Z, 2016. Iran	To evaluate the effectiveness of a psychoeducation program (PEP) on the quality of life in patients with coronary heart disease (CHD).	Randomized controlled trial (70 CHD patients, divided into intervention (n=35) and control (n=35) groups)	- Individual Education, - Group Education, - Community Education, - School-Based Education, - Technology-Based Education	- Improved Quality of Life - Increased Knowledge - Behavioral Changes - Disease Prevention - Reduced Stress and Anxiety - Community Empowerment - Lower Healthcare Costs	- Knowledge and Awareness Gaps - Limited Resource Access - Cultural and Language Differences - Social Stigma - Human Resource Constraints - Economic Instability - Health Policy Changes
Divya Cahyaningrat dan Lukman ulhakim, 2020. Indonesia	To improve the quality of life in patients with coronary heart disease (CHD) through self-management education	A quasi-experimental design with pre-post test one-group (25 patients)	- Structured Self-Management Education (lifestyle modification, nutrition, physical activity)	- Improved Quality of Life - Increased Knowledge - Behavioral Changes - Patient Empowerment	- Time Constraints - Patient Motivation - Variability in Understanding - Adherence to Recommendations - Environmental Factors
Ebrahimi et al., 2020. Iran	To investigate the effects of peer education on self-care behaviors and quality of life in myocardial infarction patients	Randomized controlled trial (70 myocardial infarction patients, 35 intervention group, 35 control group)	- Individual Education - Group Education - Peer Education - Community-Based Education - Media-Based Education	- Enhanced Quality of Life - Increased Knowledge - Improved Self-Care Behaviors - Increased Patient Independence - Reduced Hospital Visits - Enhanced Social Support	- Time and Resource Constraints - Limited Healthcare Provider Knowledge - Patient Resistance - Variability in Understanding - Limited Social Support - Psychological Conditions of Patients
Buket Özdemir dan Ebru Önler, 2020. Turkey	To evaluate the effectiveness of structured patient education on quality of life post-cardiac surgery on quality of life, self-care abilities, and anxiety levels in CABG (Coronary Artery Bypass Grafting) patients.	Experimental study with randomized controlled trial design (80 CABG patients, 40 control group, 40 experimental group)	- Structured Education (post-operative self-care, direct instructions, question and answer and audiovisual materials)	- Better Quality of Life - Increased Knowledge - Improved Daily Activity Management - Reduced Anxiety and Readmission Rates and Enhanced Self-Efficacy	- Time Constraints - Variability in Understanding - Patient Anxiety - Limited Resources - Patient Compliance
Wang et al., 2018. Singapura	To evaluate the effects of a self-directed psycho-education program in	Randomized controlled trial (129 outpatient CHD patients)	- Self-Directed Health Education - Community-Based Education - In-Hospital Based Education	- Enhanced Quality of Life - Increased Knowledge - Behavioral Changes - Enhanced Self-Management Skills	- Low Adherence Rates - Variability in Patient Characteristics - Resource Constraints

	patients with coronary heart disease (CHD).		- Digital Media-Based Education - Family-Based Education	- Improved Psychological Well-being - Reduced Service Utilization	- Perceptions and Stigma - Accessibility Issues - Mental Health Concerns
Ellis T, et al. 2023. Australia	To compare the effectiveness of an avatar-based discharge education application added to usual care versus usual care alone in patients with acute coronary syndrome (ACS).	Prospective pragmatic randomized controlled trial (72 ACS patients)	- Discharge Education - Technology-Based Education - Self-Directed Education - Evidence-Based Education	- Enhanced Quality of Life - Increased Patient Knowledge - Improved Medication Adherence - Reduced Recurrence Risk - Increased Patient Engagement - Reduced Hospital Readmissions	- Varied Digital Literacy Levels - Time Constraints - Patient Compliance - Technology Accessibility - Variability in Patient Response - Measurement Limitations
Yinyue Gu dan Wenyue Zhu, 2023. China	Evaluating the effectiveness of a WeChat-based education and rehabilitation program in improving physical performance and quality of life in patients with acute coronary syndrome following percutaneous coronary intervention (PCI).	A randomized controlled trial (180 patients with ACS post-PCI, divided into a WeChat-based Education and Rehabilitation Program (WERP) group (n=90) and a control group (n=90).	- WeChat-based Education and Rehabilitation Program (WERP).	- Enhanced Quality of Life - Improved Knowledge - Social Support - Physical Rehabilitation - Accessibility	- Technology Access - Digital Literacy - Patient Adherence - Limited Face-to-Face Interaction - Variability in Patient Response
Pei-Chen Hong et al., 2021. Taiwan	Evaluated the effects of health information technology (Health IT) interventions on self-management behaviours, quality of life, and systolic blood pressure (SBP) control in patients with coronary artery disease (CAD)	Randomized controlled trial with a waitlist design (60 CAD patients)	- Individual Health Education - Group Health Education - Public Health Education - Technology-Based Health Education - School-Based Health Education	- Improved Quality of Life - Increased Knowledge - Behavior Change - Disease Prevention - Patient Empowerment - Reduced Health Costs - Enhanced Self-Management Skills	- Limited Information Access - Cultural and Language Differences - Resistance to Change - Resource Limitations - Social Stigma - Pandemic and Health Crises
Huang et al., 2017. China	Tested the impact of community-based education and training interventions on systolic blood pressure (SBP)	Randomized controlled trial (102 high-risk individuals; 53 in the	- Group Education - Individual Coaching	- Improved Quality of Life - Increased Knowledge - Behavior Change - Better Health Management	- Resource Limitations - Participant Engagement - Social Stigma - Cultural Differences

	in individuals at high risk for coronary heart disease (CHD	intervention group and 49 in the control group)		- Social Support	
Su Jing Jing & Yu Doris Sau Fung, 2019. China	Investigated the effects of a personalized, culturally tailored eHealth cardiac rehabilitation program focused on empowerment to improve health outcomes in individuals with coronary heart disease (CHD)	Randomized controlled trial (RCT) with two parallel groups (146 CHD patients)	- Patient Education - Skills Training - Peer Support - Technology Use - Culturally-Based Education	- Improved Quality of Life - Increased Knowledge - Behavior Change - Patient Empowerment - Social Support - Access to Resources	- Limited Technology Access - Low Health Literacy - Adherence to Program - Social Bias and Memory Issues - Cultural Differences
Ma et al., 2021. China	Explored the effects of a WeChat-based education and rehabilitation program (WERP) on anxiety, depression, quality of life (HRQoL), and major adverse cardiovascular and cerebrovascular events (MACCE)	Randomized controlled trial (140 unprotected left main coronary artery disease (ULMCAD) patients who underwent CABG, divided into WERP group (n=70) and control group (n=70)	- Disease Education - Rehabilitation Guidelines - Exercise Supervision	- Improved Quality of Life - Increased Knowledge - Better Health Management - Emotional Support - Monitoring and Supervision	- Limited Technology Access - Patient Engagement Level - Differences in Understanding - Emotional Barriers - Time Constraints
Richard J. Melamed et al., 2014, Germany	Assessed the effectiveness of an educational and treatment program for coronary heart disease (CHD) patients in improving lifestyle and emergency handling skills.	Randomized controlled trial (202 patients in the intervention group and 205 patients in the control group)	- Individual Education - Group Education - Written Educational Materials - Physical Exercise Program - Emergency Handling Skills Training	- Improved Quality of Life - Increased Knowledge - Behavior Change - Emergency Handling Skills - Social Support	- Limited Access - Varying Levels of Understanding - Patient Motivation - Time Constraints - Stigma and Distrust
Mohammadi et al., 2021. Iran	Evaluated the effectiveness of multimedia education combined with the Teach-Back method in improving quality of life and reducing cardiac anxiety in patients with heart failure.	Randomized controlled trial (120 heart failure patients, Class I-III, under 60 years old, divided into three groups of 40 each.	- Multimedia Education - Teach-Back Method	- Improved Quality of Life - Improved Patient Understanding - Reduced Anxiety - Increased Medication Adherence - Encouraged Self-Care Behaviors	- Variability in Understanding - Time Constraints - Resource Availability - Resistance to Change - Patient Psychological Conditions

Pitta et al., 2022. Brazil	Evaluated the effects of an educational program on physical activity in individuals undergoing their first percutaneous coronary intervention (PCI).	Randomized controlled trial (109 patients; 56 in the usual care group, 53 in the educational program group)	- Individual Education - Group Education - Technology-Based Education	- Improved Quality of Life - Increased Physical Activity - Improved Self-Efficacy - Reduced Anxiety and Depression Symptoms - Reduced Risk of Re-admission	- Limited Access to Rehabilitation Programs - Lack of Effective Communication - Resource Limitations - Patient Perceptions and Motivation - Technological Limitations
Zi Shan, Hong Huang, Sanhui Tang, 2020. Taiwan	Evaluated the effects of diversified and staged health education on medication adherence and treatment compliance in elderly patients with CHD.	Randomized controlled trial (180 elderly patients with CHD; divided into control group (n=90) and study group (n=90	- Diversified and Staged Health Education	- Improved Quality of Life - Increased Knowledge - Medication Adherence - Reduced Risk of Adverse Events - Social Support	- Understanding Limitations - Limited Technology Access - Variability in Education Levels - Low Adherence - Limited Resources
Hui Zhang et al., 2017. Singapura	Explored the mobile health approach to educate workers about coronary heart disease (CHD) prevention.	Pilot randomized controlled trial (80 intervention group (n=40) and control group (n=40	- Formal Health Education - Non-Formal Health Education - Informal Health Education	- Improved Quality of Life - Increased Health Awareness - Behavior Change - Improved Knowledge - Reduced Health Costs	- Lack of Awareness and Knowledge - Limited Technology Access - Adherence to Program - Variability in Individual Responses - Stigma and Negative Perceptions