

*Review Article***Effect of telenursing on self-efficacy of patients undergoing coronary artery bypass grafting surgery: A systematic review**Tara Alizadeh <sup>a</sup>  | Poorya Takasi <sup>a\*</sup> <sup>a</sup> Department of Medical-Surgical Nursing, School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran

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**Abstract**

This systematic review aimed to investigate the impact of telenursing on the self-efficacy of patients undergoing coronary artery bypass grafting surgery. International electronic databases such as Scopus, PubMed, and Web of Science were systematically searched from their inception to November 1, 2023. The search utilized keywords derived from medical subject headings including "telenursing", "self-efficacy", and "coronary artery bypass grafting". Furthermore, Iranian databases like Iranmedex were consulted. The quality of randomized controlled trials and quasi-experimental studies was assessed using the Joanna Briggs Institute's critical assessment checklist. The review included a total of four studies encompassing 311 enrolled patients. Among the patient population, 69.17% were male, and 53.05% belonged to the intervention group. The average age of participants was 69.17 (SD=8.33) years. Additionally, the mean duration of study follow-up was 3.75 weeks. Also, the average duration of the intervention was 30.0 minutes. It was shown that nurses can use telenursing to increase the level of self-efficacy. It is recommended that managers and health policymakers create a platform where, in addition to using telenursing through phone calls, other methods can be used, such as video calls. In such a way that the costs of using methods other than telephone calls are balanced so that everyone can use these methods. As a result, in addition to telephone calls and digital video discs, other telenursing methods can be used to increase self-efficacy.

**Keywords:** Telenursing, Nursing, Nurses, Self-efficacy, Coronary Artery Bypass Grafting Surgery, Systematic Review.**1 | Introduction**

Due to the significant global rise in coronary artery disease cases and its associated mortality rates, coronary artery bypass grafting (CABG) has emerged as a crucial, widespread, and fundamental surgical intervention for managing cardiovascular conditions [1, 2]. CABG has benefits for patients, among these benefits can be mentioned reduction of symptoms, increase in survival rate, and improvement of patient performance [3].

Although CABG offers advantages, patients often encounter various physical, psychological, and social challenges post-operation. These challenges encompass issues such as breathlessness, incisional pain, fatigue, sleep disturbances, anxiety, leg swelling, wound infections, heart palpitations, and digestive issues [4].

Conversely, persistent complications stemming from CABG diminish patients' quality of life. Mitigating these post-open heart surgery complications stands as a critical and vital factor, with enhancing patients' self-efficacy playing a pivotal role in ameliorating their condition [5]. Self-efficacy refers to an individual's confidence in their capability to succeed in specific situations or accomplish tasks [6]. Self-efficacy has a direct relationship with patients' health behaviors [7]. Nurses find self-efficacy to be a valuable tool, as its enhancement can boost patients' motivation to self-manage their care. Moreover, it contributes to extending patients' life expectancy [8]. Regarding this matter, healthcare professionals, including nurses, can support post-CABG patients through counseling and educational initiatives [9]. The continuous follow-up of nurses is an important part of their care for patients, this follow-up can cause changes in the health behaviors of

patients [10]. One of the methods that can be used to increase the ability of patients is telenursing. This approach involves utilizing information and communication technology tools and services such as the internet, telephone, voice calls, and educational CDs [11, 12]. Conversely, tailoring programs to meet patients' specific needs can enhance their self-efficacy. Continuously training and addressing patient needs through telenursing can effectively boost their self-efficacy [13]. A study showed in Iran that telephone follow-up in patients undergoing CABG is effective in increasing the self-efficacy of these patients [14]. An additional study conducted in Iran highlighted that media-driven cardiac rehabilitation training enhances the self-efficacy of patients undergoing CABG [15].

Research has assessed the impact of telenursing on the self-efficacy of patients undergoing CABG. However, to date, no published study has thoroughly and succinctly explored this effect. Given the significance of this topic regarding telenursing's impact on self-efficacy, this systematic review was undertaken to investigate its effect on patients undergoing CABG surgery.

## **2 | Methods**

### **2.1 | Study registration and reporting**

The methodology for conducting this systematic review was based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist [16]. Notably, the International Prospective Register of Systematic Reviews (PROSPERO) database does not contain a record of this specific systematic review.

### **2.2 | Search strategy**

Systematic searches were conducted across international electronic databases such as Scopus, PubMed, and Web of Science, covering records from the earliest available date until November 1, 2023. The search utilized keywords derived from Medical Subject Headings, including "telenursing", "self-efficacy", and "coronary artery bypass grafting". For instance, in PubMed/MEDLINE, the strategy involved combining terms such as "impact", "effect", and "improve", among others, with keywords related to "telenursing", "nursing", and "self-efficacy", specifically linked to "coronary artery bypass grafting". The Persian electronic databases were also explored using the equivalent Persian keywords. Two researchers independently conducted this systematic search process. It's important to note that this review excludes gray literature, encompassing expert comments, conference presentations, dissertations, research and committee reports,

and ongoing research. Gray literature typically includes electronically published articles that haven't undergone review by a for-profit publisher [17].

### **2.3 | Inclusion and exclusion criteria**

This systematic review included interventional studies conducted in English and Persian languages, specifically focusing on the impact of telenursing on the self-efficacy of patients undergoing coronary artery bypass graft surgery. Excluded from this study were reviews, case reports, conference proceedings, letters to the editor, and qualitative studies.

### **2.4 | Study selection**

The searched articles were examined using EndNote 20 software. Two researchers independently evaluated the papers using the inclusion and exclusion criteria of this study. Article titles, abstracts, and full texts were hand-reviewed after the initial electronic review, which also involved the removal of duplicate studies. The third researcher was enlisted to assist in mediating potential disputes between the first two researchers. Finally, the sources underwent a thorough examination to prevent the loss of information.

### **2.5 | Data extraction and quality assessment**

In this systematic review, the included publications underwent analysis for various data points such as the first author's name, publication year, location, study design, sample size, intervention type, study duration, intervention duration, follow-up duration, participant demographics including age and gender distribution, control group type, characteristics of assessment tools, specific statistical tests used, and key study findings. The quality assessment for randomized control trials (RCTs) and quasi-experimental research was conducted using the Joanna Briggs Institute (JBI) critical evaluation checklist [18]. This tool assesses internal validity, participant comparability between groups, measurement precision, and appropriateness of statistical analysis with 13 and 9 items for RCTs and quasi-experimental trials, respectively. In the systematic review, two researchers independently evaluated each study's quality using a scoring system: "yes" (scored 1), "no" (scored 0), and "not applicable/not clear" (scored 0) [19]. The quality assessment ratings for the studies using JBI checklists are categorized as good ( $\geq 8$ ), fair (6-7), and poor ( $\leq 5$ ) [18].

### 3 | Results

#### 3.1 | Study selection

As shown in Figure 1, through an extensive search of electronic databases, 2,052 studies were found. 1,773 articles were left after duplicates were removed. After carefully examining the article titles and abstracts, 1,621 research was eliminated because they conflicted with the present review's purpose. 112 research were disqualified because they did not use an experimental design. After carefully examining the full texts of thirty-seven studies, it was determined that twenty-one studies were inadequate in terms of design and findings, while twelve studies lacked the necessary data. Finally, four studies [14, 15, 20, 21] remained in this systematic review.

#### 3.2 | Study characteristics

Table 1 indicates that a total of four studies [14, 15, 20, 21] enrolled 311 patients undergoing CABG surgery. Among these patients, 69.17% were male, and 53.05% were in the intervention group. The average age of participants was 69.17 years

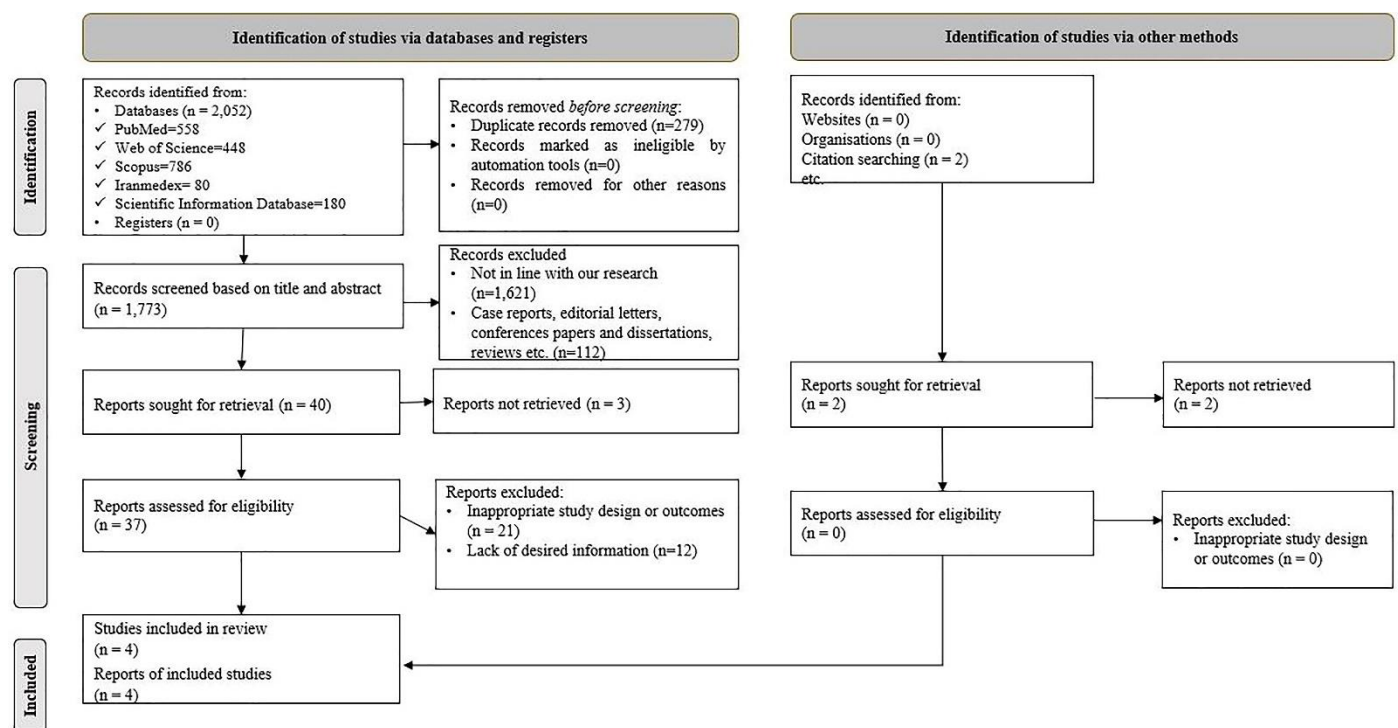
(SD=8.33). One study was quasi-experimental [21], while the remaining three were RCTs [14, 15, 20]. Among these studies, three were conducted in Iran [14, 15, 20] and one was conducted in Taiwan [21]. All studies [14, 15, 20, 21] utilized researcher-made questionnaires to assess self-efficacy.

#### 3.3 | Methodological quality assessment of eligible studies

As shown in Figure 2, of the four studies [14, 15, 20, 21], all studies had a good quality level.

#### 3.4 | Effect of telenursing on self-efficacy of patients undergoing CABG surgery

As detailed in Table 2, the average study follow-up period was 3.75 weeks, and the typical duration of the intervention stood at 30.0 minutes. Across all studies [14, 15, 20, 21], interventions associated with telenursing proved effective in augmenting the self-efficacy of patients undergoing CABG surgery.



**Figure 1.** Flow diagram of the study selection process.

**Table 1.** Basic characteristics of the included studies in this systematic review.

First Author/ year	Location	Study characteristics			Control group	Key results	JBI Score
		1. Design	2. Sample Size (I/C)	M/F ratio (%)			
Wang <i>et al.</i> , 2016 [21]	Taiwan	1. Quasi-experimental study			People in the control group had not received an inpatient multimedia exercise training program.	The mean score of self-efficacies in patients was increased after the intervention in the intervention group compared to the control groups (P<0.001).	Good
		2. 60 (20/40)					
		3. Inpatient multimedia exercise training program.	66.67/33.33	61.32 (SD=13.40)			
		4. 20 weeks					
		5. N/A					
		6. 4 weeks					
Mohebbi <i>et al.</i> , 2018 [15]	Iran	1. RCT			People in the control group had not received an inpatient multimedia exercise training program	The mean score of self-efficacies in patients was increased after the intervention in the intervention group compared to the control groups (P<0.001).	Good
		2. 60 (30/30)					
		3. Inpatient multimedia exercise training program	76.67/23.33	56.75 (SD=5.5)			
		4. N/A					
		5. 30 minutes					
		6. 3 weeks					
Gohari <i>et al.</i> , 2020 [20]	Iran	1. RCT			People in the control group did not receive telephone conversation	The mean score of self-efficacies in patients was increased after the intervention in the intervention group compared to the control groups (P=0.001).	Good
		2. 77 (38/39)					
		3. Telephone conversation	67.53/32.47	60.46 (SD=8.25)			
		4. N/A					
		5. 30 minutes					
		6. 4 weeks					
Gohari <i>et al.</i> , 2022 [22]	Iran	1. RCT			People in the control group did not receive telephone conversation	The mean score of self-efficacies in patients was increased after the intervention in the intervention group compared to the control groups.	Good
		2. 114 (77/37)					
		3. Telephone conversations and home visits	65.79/34.21	60.43 (SD=6.17)			
		4. N/A					
		5. 30 minutes					
		6. 4 weeks					

Mohebbi *et al.*, 2018  
Gohari *et al.*, 2020  
Gohari *et al.*, 2022

RCT	Was true randomization used for assignment of participants to treatment groups?	Y	Y	Y
	Was allocation to treatment groups concealed?	Y	Y	Y
	Were treatment groups similar at the baseline?	Y	Y	Y
	Were participants blind to treatment assignment?	U	U	U
	Were those delivering treatment blind to treatment assignment?	U	U	U
	Were outcomes assessors blind to treatment assignment?	U	U	U
	Were treatment groups treated identically other than the intervention of interest?	Y	Y	Y
	Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?	Y	Y	Y
	Were participants analyzed in the groups to which they were randomized?	Y	Y	Y
	Were outcomes measured in the same way for treatment groups?	Y	Y	Y
	Were outcomes measured in a reliable way?	Y	Y	Y
	Was appropriate statistical analysis used?	Y	Y	Y
	Was the trial design appropriate, and any deviations from the standard RCT design (individual randomization, parallel groups) accounted for in the conduct and analysis of the trial?	Y	Y	Y

**Figure 2.** Methodological quality assessment of RCT studies using JBI.

**Table 2.** Interventions of the studies are included in the systematic review.

First Author/ year	Intervention Program	Description
Wang <i>et al.</i> , 2016 [21]	Inpatient mul- timedia exer- cise training program	The self-efficacy of the participants in the intervention group was evaluated before the intervention. Also, before surgery, the researchers explained the sports content that the participants needed to practice using multimedia digital video discs and printed booklets. The exercise program was divided into 6 stages: exercise while supine, exercise while sitting, exercise while standing, and active movement against resistance, progressive walking, and climbing stairs. Three days after the surgery, the patients were trained according to their physical condition. Every day, the researchers taught how to do the exercises that were on the digital video disc to make sure that the participants were doing them correctly. One to two days after discharge and one month later, the self-efficacy of the participants was evaluated by the self-efficacy scale.
Mohebbi <i>et al.</i> , 2018 [15]	Inpatient mul- timedia exer- cise training program	The self-efficacy of the participants in the intervention group was evaluated before the intervention. Educational content was taught during four stages to both intervention and control groups. These four stages include admission, the tenth day after discharge, admission to the cardiac rehabilitation center, and the end of the rehabilitation session. Educational content included appropriate rehabilitation at home, exercise, dietary recommendations, pain management therapy, wound care, and risk factor management. Then self-efficacy was evaluated for the second time by questionnaire. Also, CDs containing educational content were provided to the participants of the multimedia group, and the patient and a family member were taught how to use it. Finally, after 3 weeks, participants' self-efficacy was re-evaluated.
Gohari <i>et al.</i> , 2020 [20]	Telephone conversation	At first, the researcher gave the necessary explanations to the participants of the intervention group and handed over the educational booklet containing the contents of the rehabilitation program to the intervention group at the time of discharge. On the first day after discharge, a pre-test was taken from the participants using self-efficacy assessment tools. How to complete the questionnaire was explained to the participants and their caregivers. After completing these questionnaires, they were sent to the researcher through a mobile phone and by one of the social communication software (Telegram). This rehabilitation program was conducted in the form of training and telephone counseling for 30 minutes twice a week for the participants. After four weeks, participants' self-efficacy was re-evaluated by a researcher made questionnaire.
Gohari <i>et al.</i> , 2022 [22]	Telephone conversation	At first, the researcher gave the necessary explanations to the participants of the intervention group and handed over the educational booklet containing the contents of the rehabilitation program to the intervention group at the time of discharge. It also explained how to do the exercises in the booklet to the participants and their families. Phone counseling was done twice a week for 30 minutes, and then after 4 weeks, the self-efficacy of the participants was re-evaluated by a self-administered questionnaire.

#### 4 | Discussion

The purpose of this systematic review was to investigate the impact of telenursing on the self-efficacy of patients undergoing CABG surgery. The findings from this review indicate that telenursing, delivered through phone calls and digital video discs, can indeed elevate self-efficacy levels in these patients.

Cardiovascular diseases stand as a prominent global cause of mortality, accounting for approximately 50% of all deaths in developed nations [22]. Among the prevalent treatment approaches for this condition is CABG, a surgical procedure that, despite its effectiveness, may result in various complications like angina pectoris and vein graft obstruction [23]. After heart surgery, most patients think that they will be sick for the rest of their lives and reduce their daily activities due to their lack of knowledge and misconceptions about their condition [24]. Therefore, nurses have a vital role in increasing the awareness of patients and should encourage patients to perform activities and make them believe that they can resume their activities and reduce the complications of surgery. Enhancing the self-efficacy of patients is recognized as a means to achieve this objective [25, 26]. Apart from conventional training methods, alternative approaches like telenursing can be employed to bolster self-efficacy. The current

systematic review underscores that telenursing stands as an alternative and effective approach to enhancing patients' self-efficacy [14, 15, 20, 21].

The findings of this systematic review show that telenursing has an effect on self-efficacy in patients undergoing CABG. In addition, according to previous studies, this intervention can be effective in increasing self-efficacy in other complications such as heart attack [13]. Another study conducted in Iran demonstrated that telenursing effectively enhances self-efficacy among patients with type 2 diabetes [27]. These findings suggest that telenursing isn't solely beneficial for improving self-efficacy in patients undergoing CABG but could also prove effective for other health conditions and complications. Consequently, health managers and policymakers should establish a comprehensive platform that incorporates various telenursing methods, such as video calls, alongside telephone calls and educational digital video discs. However, it's essential to strike a balance in the costs associated with these methods to ensure accessibility for all individuals.

#### 4.1 | Limitations

Just like any other systematic review, this one had some limitations. In this study, meta-analysis was not performed. A methodical approach to data collecting, organizing, and research analysis continued in this study even if a meta-analysis was not used. Despite an extensive search across databases, it is possible that not all studies about this topic were identified. Additionally, this systematic review exclusively encompasses research published in English, potentially overlooking studies written in other languages.

#### 4.2 | Implications for education, practice, and management in nursing

Thus, considering the outcomes of this study and the significance of enhancing self-efficacy among patients undergoing CABG, nurses have the potential to elevate patients' self-efficacy levels through the application of telenursing.

#### 4.3 | Recommendations for future research

As per the findings of this systematic review, telenursing primarily employed phone calls and digital video discs. Hence, there's a recommendation to explore additional telenursing methods in future studies. Furthermore, this review exclusively examined Iran and Taiwan; therefore, other nations should investigate the impact of telenursing on self-efficacy among patients undergoing CABG through interventional studies.

### 5 | Conclusions

Overall, the findings from this systematic study suggest that nurses have the potential to enhance the self-efficacy of patients undergoing CABG through the application of telenursing.

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#### Authors' contributions

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work: TA, PT; Drafting the work or revising it critically for important intellectual content: TA, PT; Final approval of the version to be published: TA, PT; Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved: TA, PT.

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#### Competing interests

We do not have potential conflicts of interest with respect to the research, authorship, and publication of this article.

#### Availability of data and materials

The datasets used during the current study are available from the corresponding author on request.

#### Using artificial intelligent chatbots

None.

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