

# Factors predicting depression among persons post-coronary artery bypass graft surgery: A cross-sectional study in Thailand

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## Abstract

**Background:** Coronary artery bypass graft (CABG) surgery is a highly effective coronary artery disease treatment, providing immediate relief and promising long-term benefits. However, it is a major procedure with significant risks, including the potential for depression. Many patients experience depression following CABG, which can negatively impact their overall recovery, affecting both physical and mental health.

**Objective:** This study aimed to determine factors predicting depression in patients following CABG surgery.

**Methods:** This cross-sectional study was conducted with data collected between January and April 2024. A total of 272 post-CABG patients from two super tertiary care hospitals in Bangkok, Thailand, were recruited through purposive sampling. All research instruments were validated and tested for reliability. Data were analyzed using multiple regression analysis.

**Results:** The study found that hope, optimism, illness perception, social support, and anxiety were correlated with depression (adjusted  $R^2 = 0.381$ ), but these variables explained only 38.1% of the variance ( $p < 0.05$ ). Among these factors, anxiety ( $\beta = 0.311$ ), optimism ( $\beta = 0.203$ ), social support ( $\beta = -0.117$ ), and illness perception ( $\beta = -0.143$ ) were significant predictors ( $p < 0.05$ ), while hope was not a significant predictor. Thus, anxiety emerged as the most crucial predictor of depression in patients who have undergone CABG.


**Conclusion:** Nurses play a vital role in preventing and managing depression in post-CABG patients. Screening for anxiety and addressing it can prevent depression, enhance social support, and improve outcomes. To develop effective nursing strategies, it is essential for nurses to assess anxiety and implement interventions that promote social support, optimism, and illness perception. These measures can improve care quality, reduce readmission rates, and enhance patients' overall quality of life.

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## Keywords

Thailand; coronary artery bypass grafting; heart surgery; hope; optimism; illness perception; social support; anxiety

## Background

Cardiovascular disease is the number one cause of death worldwide. In 2019, cardiovascular disease claimed the lives of 17.9 million people, accounting for 32% of all worldwide deaths (World Health Organization (WHO), 2021). In Thailand, coronary artery disease is the fourth most significant cause of death, with a death rate of 35.1 per 100,000 persons (Strategy and Planning Division Office of the Permanent Secretary Ministry of Public Health, 2023). In 2018, there were 78,254 new patients aged 15 and up, with a morbidity rate of 160.28 per 100,000, and coronary heart disease accounted for 12% of all deaths (Department of Disease Control Division of Noncommunicable Diseases, 2020).

Coronary artery bypass surgery (CABG) is a highly effective treatment method for reducing the death rate when medication and angioplasty are not effective. In Thailand, the number of CABGs performed in 2020, 2021, 2022, and 2023 was 6,646, 6,250, 6,942, and 7,748 cases, respectively

(Association of Thoracic Surgeons of Thailand, 2023). Undergoing CABG surgery can lead to feelings of depression in patients due to the significant nature of the procedure and the potential risks involved. The primary pathophysiological factors that contribute to depression have been extensively studied and are well understood. These factors include dysregulation of the autonomic nervous system, heightened inflammation, and disruption of the hypothalamic-pituitary-adrenal axis (Vu & Smith, 2023). When there is an inflammatory process in the body, it leads to elevated cortisol levels, which in turn triggers the production of cytokines, disrupting the balance of serotonin and norepinephrine neurotransmitters. Consequently, this may contribute to the emergence of depression (Pourafkari et al., 2016).

Depression affects 15-33% of post-CABG patients (Correa-Rodríguez et al., 2020), with a statistically significant increase from pre-operative levels (Acikel, 2019; Ravven et al., 2013). Depression increased from 23% to 37.7% during the pre-CABG period, and 29.2% of new post-CABG patients had

depression before discharge (Horne et al., 2013). A meta-analysis of depression in patients post-CABG found that depression increased during the initial period after surgery. It was shown that depression can occur as early as two weeks after surgery. Depression is also observed when patients are discharged from the hospital and return to their homes, affecting 35.5% (Ravven et al., 2013). This finding is consistent with Gallagher and McKinley (2009), who reported that 38.6% of patients experienced depression for two weeks following CABG. Yang et al. (2015) found that 21% of patients experienced depression four weeks after CABG. According to a survey conducted by Khoueir et al. (2011), the prevalence of depression following CABG was 60% at one month, 44% at three months, 40% at six months, and 44% at nine months. Acikel (2019) classified individuals with depression into three levels: low (40%), moderate (23.1%), and severe (1.5%). Thus, depression is a significant issue among individuals who have undergone coronary artery bypass graft (CABG) surgery and are transitioning from the hospital to their home (Khoueir et al., 2011; Ravven et al., 2013; Yang et al., 2015).

Depression affects both physical and mental health throughout recovery. If patients do not receive care following CABG, their depression symptoms may deteriorate by 15.3% within the first six weeks of discharge. Additionally, 16.3% of patients reported symptoms of chronic depression. Depression impacts pain and pain intensity (Doering et al., 2014), which is consistent with the study by Sadeghi et al. (2017), which found that post-CABG patients with high levels of depression were unable to recover both physical and mental health within four weeks after surgery. In these cases, 99% of patients with depression frequently experienced recurrent chest pain (45%), arrhythmias, heart failure, and other heart problems (Foss et al., 2012). Furthermore, the study by Geulayov et al. (2018) found that patients who experienced depression following CABG surgery were more likely to die within a year. A ten-year follow-up study of CABG patients revealed that those with depression had a statistically significant higher mortality rate compared to those without depression (46% vs. 29%) (Nguyen et al., 2018).

A review of the literature on depression in post-CABG patients revealed that the majority of studies focus on the prevalence, incidence, and comparison of depression before and after CABG. These studies are often specific to particular settings, and international research may not be directly applicable to the Thai context due to cultural differences. According to the literature review, there have been studies on the effects of depression on functional ability after CABG (Waiwaree et al., 2017) and the effectiveness of a comprehensive cardiac rehabilitation program on recovery and depression post-CABG (Nakon et al., 2015). Additionally, research has examined factors associated with depression, particularly in individuals with myocardial infarction. However, no studies have specifically investigated characteristics that directly predict depression in post-CABG patients. It has been found that 35-60% of post-CABG patients still experience depression, particularly after discharge and return home. Therefore, research on the characteristics that predict depression in post-CABG patients is needed to identify factors that may predict depression among this population.

Depression in post-CABG patients is a common mental condition that manifests as a mood disorder characterized by

sadness, loss of interest, diminished cheerfulness, and low energy. Depression impedes CABG recovery, particularly during the two weeks following surgery, when patients transition from the hospital to home. Therefore, variables were selected using the transition theory of Chick and Meleis (1986), which defines transition as moving from one life stage, condition, or status to another, including procedural, temporal, and cognitive components. Transitions are complex developmental processes that occur spontaneously in health and illness.

The variables for this study were chosen based on transition theory and a literature review. Depression in post-CABG patients is influenced by several factors related to personal and community conditions. Firstly, optimism is strongly negatively related to depression in these patients; higher levels of optimism are associated with lower levels of depression (Ai & Carretta, 2021; Ai & Smyth, 2021). Similarly, hope has a negative correlation with depression, meaning that patients with greater hope experience less depression following CABG (Ai & Smyth, 2021; Bjørnnes et al., 2018). In contrast, anxiety is positively related to depression, indicating that higher levels of anxiety can lead to increased depression in post-CABG patients (Kidd et al., 2016; Rao et al., 2020; Sawalha et al., 2024). Additionally, illness perception significantly affects depression; patients who have a negative perception of their illness are more likely to experience higher levels of depression (Jennings et al., 2023; Nuraeni et al., 2021). Lastly, social support plays a crucial role; strong social support is associated with lower levels of depression in post-CABG patients (Ai & Smyth, 2021; Allabadi et al., 2019; Kazukauskienė et al., 2021). These factors highlight the importance of addressing personal and community-related variables to improve patients' mental health and recovery outcomes following CABG.

Nurses are pivotal in caring for patients after CABG throughout all phases. To develop effective nursing plans, nurses must comprehensively understand all factors influencing a patient's physical and mental rehabilitation. Transitional care from hospitalization to home and into the rehabilitation phase is crucial, and nursing plays an essential role in evaluating the health status of post-CABG patients. According to the 2021 Guideline for Coronary Artery Revascularization, it is recommended that patients undergoing CABG be evaluated for depression and directed toward appropriate therapy to improve treatment outcomes and enhance overall quality of life (Lawton et al., 2022). Therefore, the objective of this study was to determine factors predicting depression in patients who have undergone CABG surgery in Bangkok, Thailand.

## Methods

### Study Design

A cross-sectional study was conducted to examine the roles of social support, anxiety, hope, optimism, and illness perception in relation to depression among patients who underwent CABG surgery.

### Samples/Participants

Patients who have undergone CABG surgery visit the outpatient department to receive services. The sample size

was determined using power analysis (Polit & Beck, 2009). The significance level was set at 0.05, and the test power was 0.80. To calculate the sample size, Cohen's test power table (Cohen, 1988) was referred to, and an effect size of 0.15 was selected. Based on these criteria, a sample size of 272 patients was determined. Participants were selected from tertiary care hospitals in Bangkok, Thailand. Those who voluntarily consented to participate in the study were evaluated for eligibility according to the following inclusion criteria: 1) starting two weeks after surgery; 2) aged over 20; 3) without cognitive impairment or other disease complications; and 4) with the ability to read and understand Thai. The exclusion criteria included patients experiencing high-risk complications, such as chest pain, or those in critical condition requiring immediate hospitalization.

### Instruments

Permission was granted to use six instruments in this study.

1) The Cardiac Depression Scale (CDS) (Hare & Davis, 1996) and its revised Thai version by Polsook and Aunguroch (2019). This scale was used to measure depression in cardiac patients, characterized by negative emotions such as sleep disturbances, uncertainty, mood changes, hopelessness, inactivity, anhedonia, and cognitive issues. The CDS consists of 26 items addressing these aspects. Responses are rated on a scale of 1 to 7, with 1 indicating strong disagreement and 7 indicating strong agreement. The overall score ranges from 26 to 182. A score below 90 indicates no depression, a score between 90 and 100 suggests mild to moderate depression, and above 100 indicates severe depression. In this study, the scale had a Cronbach's  $\alpha$  of 0.74.

2) Social support pertains to how a person perceives receiving care and support from family, friends, and significant others after CABG. The Multidimensional Scale of Perceived Social Support (Zimet et al., 1988), translated into Thai by Wongpakaran et al. (2011), was used. This 12-item questionnaire assesses three aspects of perceived social support: friends, family, and significant others. Participants rated items on a Likert scale from 1 (strongly disagree) to 7 (strongly agree), with total scores ranging from 12 to 84. Higher scores indicate higher levels of social support. A score of 12 to 36 indicates low social support, 37 to 60 suggests moderate social support, and 61 to 84 indicates high social support. In this study, the scale had a Cronbach's  $\alpha$  of 0.73.

3) Anxiety is an individual's feeling of mental uneasiness caused by the anticipation of potential future events following CABG. Anxiety can affect daily life by causing abnormal symptoms during activities, periods of rest, avoidance of physical activity, and the need to communicate one's health status to family or friends. The Cardiac Anxiety Questionnaire (Eifert et al., 2000) was used in its Thai version by Inyoo and Polsook (2022). The 18-item questionnaire includes three subscales: fear (8 items), avoidance (5 items), and attention (5 items), rated on a Likert scale from 0 (never) to 4 (always). Higher scores indicate more severe symptoms. The total score is divided by the number of items, ranging from 0 to 4. In this study, the Cronbach's  $\alpha$  for the overall scale was 0.81.

4) Hope is an individual's optimistic mindset following CABG surgery, characterized by a strong desire and motivation to achieve positive outcomes. These outcomes include physical, mental, emotional, and social well-being,

allowing individuals to resume their usual lives and maintain the drive needed to achieve their goals. The Hope Scale (Snyder et al., 1996), used in its Thai version by Inyoo and Polsook (2021), has 12 components. Four items assess route thinking, four evaluate agency thinking, and four are fillers. Participants rate items on an 8-point scale from "absolutely false" to "absolutely true," with total scores ranging from 8 to 32. Scores from 8.00 to 15.99 indicate a low level of hope, scores from 16.00 to 24.99 indicate moderate hope and scores from 25.00 to 32.00 indicate a high level of hope. In this study, the Cronbach's  $\alpha$  for the overall scale was 0.74.

5) Optimism, in the context of CABG, refers to a person's positive perception and outlook on their future objectives and aspirations, particularly the positive outcomes they anticipate after treatment. The Optimism Scale (Saenpunya, 2010) was developed to assess this concept of optimism. It is divided into three dimensions: permanence, pervasiveness, and personalization. These dimensions help to interpret the underlying reasons behind this behavior. The scale has 15 questions rated on a 4-point scale, ranging from the most realistic option to the least realistic. Seven questions focus on positive aspects, while eight address negative elements, resulting in a total score ranging from 15 to 60 points. A score between 15.00 and 30.99 indicates a relatively low level of optimism, 31.00 to 45.99 indicates a positive outlook, and 46.00 to 60.00 indicates a high level of optimism. In this study, the Cronbach's  $\alpha$  coefficient for the total scale was 0.72.

6) Illness perception relates to a person's views on their illness following coronary bypass surgery, including cognitive and emotional representations. The Brief Illness Perception Questionnaire (Broadbent et al., 2006), using the Thai version by Sowattanagoon et al. (2009), was employed to assess these cognitive and emotional perceptions. This eight-item questionnaire evaluates cognitive representations of illness, emotional representations, and overall illness comprehension. Each question is scored on a scale from 0 to 10, with higher scores indicating a more severe perception of the illness. The total score is obtained by summing the scores of all eight items, with a possible range from 0 to 80. Higher scores reflect a greater perception of the illness. In this study, the Cronbach's  $\alpha$  for the overall scale was 0.79.

### Data Collection

Following approval from the ethics committee, the study objectives and procedures were communicated to nurses and physicians at each hospital. The study was conducted at the outpatient departments of two university hospitals in Bangkok, Thailand, specializing in cardiovascular-thoracic surgery. Information was gathered from the hospital's electronic patient data system, and patients' reported outcomes were collected through a questionnaire survey. The participants were first screened to determine their eligibility. Those who met the inclusion criteria were invited to participate, with informed consent explaining the study details and their rights. After consent, participants completed the questionnaires, taking approximately 20-30 minutes. Data were collected between January and April 2024.

### Data Analysis

Data were analyzed using IBM SPSS Statistics Version 29.0.1.0 for macOS 14. The correlation between variables was

determined using Pearson's product-moment correlation coefficient. Stepwise multiple regression analysis was used to evaluate the predictive factors. The statistical results were considered significant, with a *p*-value of less than 0.05.

### Ethical Considerations

This study was approved by the Institutional Review Boards of the Faculty of Medicine, Chulalongkorn University (IRB No. 0644/66) and Mahidol University (IRB No. MURA2023/775). The approval was granted in accordance with international human research protection guidelines, including the Declaration of Helsinki, The Belmont Report, CIOMS Guidelines, and the International Conference on Harmonization in Good Clinical Practice (ICH-GCP).

## Results

### Characteristics of the Participants

A total of 272 post-CABG patients participated in the study. Most participants were male (70.2%), and the mean age was  $67.5 \pm 8.49$  years. The majority were married (80.5%). One-third had a secondary-level education (33.5%), and nearly one-third of participants were business operators (26.1%). Approximately half of the participants had National Health Security support (44.9%). More than half had three or more comorbidities (64.0%), and most had a hospital stay of 5 to 22 days (97.3%). More than half of the participants had been post-CABG for 12 months or more (56.3%) (Table 1).

**Table 1** Demographic characteristics of patients after CABG surgery (*N* = 272)

Characteristics	<i>n</i>	%
<b>Age</b>		
35-47	5	1.8
48-60	46	16.9
61-75	160	58.8
76-88	61	22.5
<b>Gender</b>		
Male	191	70.2
Female	81	29.8
<b>Marital status</b>		
Single	25	9.2
Widow	9	3.3
Divorced	19	7.0
Marriage	219	80.5
<b>Education level</b>		
Elementary	65	23.9
Secondary	91	33.5
Post-secondary	39	14.3
Bachelor's	70	25.7
Above Bachelor	7	2.6
<b>Occupation</b>		
Do not work	56	20.6
Employee	44	16.2
Government official / State enterprise	19	6.9
Government pension	65	23.9
Business	71	26.1
Agriculture	17	6.3
<b>Type of health care coverage</b>		
Universal Coverage Scheme (the 30-Baht Scheme)	122	44.9
Social security	19	7.0
Pay by themselves	8	2.9
Government coverage	116	42.6
Health Insurance	7	2.6
<b>Comorbidities</b>		
0	3	1.1
1	20	7.3
2	75	27.6
≥3	174	64.0
<b>Length of stay (day)</b>		
5-22	255	93.7
23-39	13	4.8
40-57	4	1.5
<b>Time after CABG surgery</b>		
2 weeks - 1 month	28	10.3
≥1 month	31	11.4
≥3 months	31	11.4
≥6 months	20	7.3
≥9 months	9	3.3
≥12 months	153	56.3



## Predictors of Depression

Half of the participants reported having high social support (51.47%). Most experienced high levels of anxiety (86.40%). More than half had high levels of hope (69.85%). A moderate level of optimism was observed in 54.41% of the participants, and a moderate level of illness perception was seen in 80.88%. The mean depression score was  $64.99 \pm 13.11$ . According to Pearson's product-moment correlation, five variables were statistically significant. Social support, hope, and illness perception were significantly negatively associated with depression ( $r = -0.373, -0.382, \text{ and } -0.404$ , respectively;  $p < 0.001$ ), whereas anxiety and optimism were significantly positively associated with depression ( $r = 0.505 \text{ and } 0.454$ , respectively;  $p < 0.001$ ).

The overall test of the regression, with an  $F$  ratio of 34.296 ( $p < 0.001$ ), indicated that optimism ( $\beta = 0.203$ ), illness perception ( $\beta = -0.143$ ), social support ( $\beta = -0.117$ ), and anxiety ( $\beta = 0.311$ ) were significantly correlated with depression ( $p < 0.05$ ). In contrast, hope was not significant. There was no multicollinearity in this sample, with the lowest tolerance at 0.667 and variance inflation factors ranging from 1.283 to 1.498. The overall regression model is detailed in **Table 2**, with Multiple  $R$  at 0.626,  $R^2$  at 0.392, adjusted  $R^2$  at 0.381, and the standard error of the estimate at 10.317. The analysis showed that hope, optimism, illness perception, social support, and anxiety were correlated with depression (adjusted  $R^2 = 0.381$ ), but these five variables accounted for only 38.1% of the variance ( $p < 0.05$ ).

**Table 2** Factors predicting depression in patients after CABG surgery

Model	Unstandardized Coefficients		Standardized Coefficients	$t$	Sig.	95.0% Confidence Interval for $B$		Collinearity Statistics	
	$B$	Std. Error	Beta ( $\beta$ )			Lower Bound	Upper Bound	Tolerance	VIF
(Constant)	54.566	15.723		3.471	<0.001**	23.609	85.523		
Hope	-0.558	0.305	-0.107	-1.826	0.069	-1.159	0.044	0.667	1.498
Optimism	0.798	0.228	0.203	3.503	<0.001**	0.349	1.246	0.678	1.474
Illness perception	-0.306	0.120	-0.143	-2.558	0.011	-0.541	-0.070	0.728	1.373
Social support	-0.228	0.105	-0.117	-2.162	0.032	-0.435	-0.020	0.779	1.283
Anxiety	11.733	2.079	0.311	5.645	<0.001**	7.640	15.826	0.752	1.330
<b>ANOVA</b>									
Model	$df$		$F$	Sig.					
Regression	5		34.296	<0.001					

Multiple  $R = 0.626$ ,  $R^2 = 0.392$ , adjusted  $R^2 = 0.381$ , S.E.est = 10.317,  $p < 0.001$

Note: \*\*  $p < 0.001$

## Discussion

According to the results of this study, the five factors of social support, hope, illness perception, anxiety, and optimism explained 38.1% of the variance ( $p < 0.05$ ) in depression among post-CABG patients. Among these factors, social support, illness perception, anxiety, and optimism were significant predictors. Social support emerged as a key predictor of depression, likely because a majority of participants were married (80.5%), which provided them with someone to care for them and potentially prevented signs of depression. In Thailand, it is common for people to have tightly connected extended families, and many participants in this study lived with their family members. This close-knit family structure may have contributed to the care and assistance provided to these individuals (Polsook et al., 2013, 2016).

A recent study by Ai and Smyth (2021) found that married individuals had lower levels of depression due to the presence of a caring and supportive spouse. Similarly, Jannati and Aslani (2023) observed that patients who received strong social support after CABG surgery experienced better recovery and fewer symptoms of depression. Furthermore, Ai and Smyth (2021) identified an intriguing relationship between social support and depression in post-open heart surgery patients, showing that higher levels of social support were associated with fewer symptoms of depression. Kazukauskienė et al. (2021) also found a significant relationship between social support and depression in post-

CABG patients, with higher levels of social support correlating with reduced rates of depression.

Illness perception was significantly negatively correlated with depression, as most post-CABG patients had a moderate level of awareness about their illness, accounting for 80.88% of the participants. Nearly half of the participants had higher education (42.6%), which may have contributed to their understanding of the health implications and severity of their disease. This finding is consistent with a previous study by Nuraeni et al. (2021), which found that negative illness perceptions in coronary artery disease patients were associated with increased depression. Jennings et al. (2023) also explored the associations between illness perceptions, health literacy, and depression in patients with coronary heart disease. Their study found that participants with a high level of illness perception were linked to fewer symptoms of depression.

Anxiety was found to predict depression among post-CABG patients in this study because a significant proportion of participants experienced high levels of anxiety (86.40%). Most participants stayed in the hospital for more than five days (93.7%), which could contribute to heightened anxiety. Additionally, more than half of the participants had three or more comorbidities, which may have led to longer hospital stays and increased anxiety. These findings are consistent with a previous study by Rao et al. (2020), which examined the prevalence, correlates, and predictors of depression in cardiac patients undergoing rehabilitation and identified anxiety as a strong predictor of depression. Similarly, Kidd et al. (2016)

found that high anxiety in post-CABG patients was associated with increased depression, and [Sawalha et al. \(2024\)](#) also observed that high anxiety in post-CABG patients was linked to higher levels of depression.

Another variable that predicted depression among post-CABG patients was optimism. More than half of the participants (54.41%) had moderate optimism, which likely contributed to a positive outlook and expectations for the future. Having valued and anticipated goals can be beneficial. However, the findings of this study differ from previous research, which generally showed a correlation between a positive outlook and reduced levels of depression. [Ai and Smyth \(2021\)](#) surveyed factors associated with depression in individuals who underwent open-heart surgery and found a negative correlation between optimism and depression. Their study indicated that individuals with a positive outlook experienced lower levels of depression post-CABG. Similarly, [Ai and Carretta \(2021\)](#) found that post-open heart surgery patients with high levels of optimism were less likely to experience depression. [Rozanski et al. \(2019\)](#) conducted a meta-analysis and systematic review of the association between optimism and future cardiovascular events, revealing a significant inverse relationship between optimism and depression.

In contrast, hope did not predict depression among post-CABG patients in this study. This may be due to the fact that more than half of the participants had a high level of hope (69.85%), and most did not have depression. This finding contrasts with the research of [Ai and Smyth \(2021\)](#), which identified a negative correlation between hope and depression. Additionally, a study by [Bjørnnes et al. \(2018\)](#) investigated the links between hope, marital status, depression, and persistent pain in individuals who had undergone cardiac surgery, revealing a negative correlation between hope and depression. [Cui et al. \(2021\)](#) examined the prevalence of depression symptoms among women with systemic lupus erythematosus (SLE) and found that hope was negatively associated with depression.

### Strengths and Limitations

This study was among the first in Thailand to investigate depression among post-CABG patients, applying the transition theory by [Chick and Meleis \(1986\)](#) to understand the shift from one life stage, condition, or status to another. The theory includes procedural, temporal, and cognitive components, highlighting that transitions are complex developmental processes that naturally occur in both well-being and illness. This research explored the impact of post-CABG hospital stays on depression levels until patients returned home. Additionally, using a random sampling method with a substantial sample size provided strong statistical power. However, the study had some limitations. Depression was investigated in post-CABG patients starting two weeks after surgery, which lacks a clear division or definition of the postoperative period. As a result, the findings might not provide a precise timeline for when depression might develop after CABG. Another limitation was that the data, based on self-reports, could potentially lead to overestimated or underestimated values.

### Implications of the Study and Recommendations for Future Research

The results of this study highlight the factors influencing depression in post-CABG patients. To benefit these patients, it is essential to use these findings as a guide for developing a nursing care program aimed at preventing depression following coronary artery bypass graft surgery. Emphasis should be placed on screening patients for depression both before and after surgery. According to the study findings, it is crucial for nurses, as part of the healthcare team, to promote social support for post-CABG patients. This can be achieved by providing patients with knowledge to enhance their understanding of their illness and fostering optimism. Additionally, screening patients for anxiety and developing strategies to reduce anxiety levels are critical. Implementing these strategies can significantly improve the quality of care for CABG patients. Furthermore, developing nursing care programs that incorporate theory-based interventions, including concepts such as positivity, illness perception, social support, and anxiety, can effectively address and prevent depression in post-CABG patients. Future research should involve a comprehensive investigation of depression at various stages of the CABG process, including before the procedure and throughout the recovery period. This could include exploring patients' experiences in the intensive care unit and during their hospital stay. Long-term studies are also recommended to assess the progression of these factors and the occurrence of depression in CABG patients. Such studies would help establish a clearer understanding of the causes and contributing factors of depression in this population.

### Conclusion

The study examined the factors contributing to depression in patients who have undergone CABG, using a transitional framework as the basis. The findings emphasized the significant impact of social support, optimism, illness perception, and anxiety on depression. Nurses should utilize this valuable information about modifiable factors to work collaboratively as a healthcare team and develop effective nursing interventions and strategies to address depression in post-CABG patients.

### Declaration of Conflicting Interest

All authors declared no potential conflicts of interest in this study.

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### Authors' Contributions

All authors contributed equally to the study design, data collection, data analysis, interpretation, drafting of the article, critical revision, and final approval of the article to be published.

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## Data Availability

The datasets generated during and analyzed for the current study results are available from the corresponding author upon reasonable request.

## Declaration of Use of AI in Scientific Writing

Nothing to disclose.

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