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# Illness cognition and depression among patients with coronary heart disease

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## Abstract

**Background:** Depression is a significant predictor of the quality of life among patients with coronary heart disease. Therefore, it is essential to explore the factors associated with depression. Illness cognition is considered one of the factors affecting depression. However, the relationship between illness cognition and the incidence of depression among Indonesian patients have not been widely investigated.

**Objective:** This study aimed to investigate the correlation between illness cognition, consisting of the acceptance, perceived benefits, and helplessness variables, and depression in patients with coronary heart disease.

**Methods:** This study employed a correlational research design with a total of 106 patients undergoing treatment at a hospital in West Java, Indonesia, selected using convenience sampling. Data were collected using a demographic questionnaire, Beck-Depression Inventory-II (BDI-II), and ICQ (Illness-Cognition Questionnaire). Data were analyzed using mean (SD), median, frequency distribution, and Spearman-rank.

**Results:** 72% of respondents had no depression. Nevertheless, mild, moderate, and major depression suffered by 15%, 9%, and 4% of respondents, respectively. In terms of illness cognition, patients scored higher within the perceived benefits dimension (mean 20.13, SD 3.05), followed by acceptance (mean 18.22, SD 3.33) and helplessness (mean 13.20, SD 4.77), respectively. Furthermore, helplessness was significantly associated with depression ( $p < .01$ ) with a positive correlation coefficient ( $r$ ). Also, all items on the helplessness dimension had a significant correlation ( $p < .01$ ) with depression accompanied by a positive  $r$ -value.

**Conclusion:** Helplessness had a significant relationship with depression. So, cardiovascular nurses can anticipate depression in patients by making nursing interventions that can decrease the patients' feelings of helplessness. Thus, factors that reduce helplessness need to be explored and taken into accounts in the treatment of patients with coronary heart disease.

## Keywords

acceptance; coronary heart disease; depression; helplessness; illness cognition; perceived-benefits; nursing

Globally, Coronary Heart Disease (CHD) has become a leading cause of death with an increasing trend (Mensah et al., 2019). In addition, the current increase in air pollution in the form of PM2.5 (2.5-micron air particles) adds to the global age-standardized burden of CHD in several low- and middle-income countries, especially in Asia, Oceania, and Africa (Wang et al., 2021). In Indonesia, the Basic Health Research 2018 indicated a very high prevalence of CHD risk factors such as smoking, physical activity, and

hypertension, ranging from 28 to 33%. Moreover, following the situation leads to an increase in the number of Indonesian people getting cardiovascular disease (Uli et al., 2020). This condition shows that the health burden due to cardiovascular disease will rise in Indonesia (Adisasmito et al., 2020; Uli et al., 2020). Moreover, CHD is still a health problem that requires attention as its rates being the leading cause of death following stroke, causing 37% of deaths in Indonesia (Chow et al., 2017).

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CHD has an impact on the physical and psychological aspects of the patient. However, this psychological problem is still not optimally managed. Some studies indicated the failure of interventions for CHD patients to effectively deal with psychological issues such as anxiety and depression compared to physical problems after an acute condition (Su & Yu, 2019; Nuraeni et al., 2020; Turan Kavrakdim et al., 2020). In accordance, nurses as care providers have a role in providing holistic nursing care, including physical, psychological, and spiritual aspects. Consequently, nurses have opportunities and challenges in managing psychological problems that may occur in CHD patients.

On the psychological aspect, CHD patients often experience depression (Carney & Freedland, 2017). According to Lichtman et al. (2014) and Vaccarino et al. (2020), as much as 15-30% of CHD patients encounter depression. Specifically in Indonesia, Nur'aeni et al. (2019) found that 41% of 100 CHD patients undergoing outpatient treatment experienced depression. In addition, another study showed that 27.3% of 77 CHD patients experienced mild to severe depression (Chaerunnisa et al., 2017). Recent research in a cardiac intensive care unit found that 100% of the 84 CHD patients experienced mild (35.7%), moderate (58.3%), and severe depression (6.0%) (Amni, 2020). Those Indonesian studies affirmed that depression is a substantial problem experienced by CHD patients.

Several studies have also shown a high prevalence of depression followed by increased mortality and morbidity in CHD patients. Results of a systematic review by Lichtman et al. (2014) showed that depression was associated with an increased risk of death in patients with myocardial infarction. In addition, depression was also associated with severe functional disorders, low adherence to therapy, and low participation in cardiac rehabilitation (Vaccarino et al., 2020). Moreover, studies on quality of life also showed that depression was the strongest predictor of low quality of life in patients with CHD (Lane et al., 2000; Müller-Tasch et al., 2007; Nuraeni et al., 2016), compared to other factors of symptom severity in heart disease, such as angina, functional capacity, or dyspnea (Amin et al., 2006; Hare et al., 2014; Nuraeni et al., 2016).

Depression in CHD patients, if not treated properly, will give a poor prognosis. Although it can be treated with antidepressants, serotonin-norepinephrine reuptake inhibitors, tricyclic antidepressants, and selective serotonin reuptake inhibitors (Vaccarino et al., 2020), the use of antidepressants is significantly associated with fatal CHD complications such as sudden cardiac arrest (SDA) (Whang et al., 2009). This situation shows the importance of examining the causes of depression to provide appropriate intervention.

Previous studies attempted to identify factors associated with depression in patients with CHD in Indonesia. These factors were social support, anxiety, spiritual wellbeing, marital status, physical limitations, frequency of angina, and factors related to treatment history. These studies indicated that depression was associated with low spiritual wellbeing (Nur'aeni et al.,

2019), anxiety (Nuraeni et al., 2018), and low social support (Chaerunnisa et al., 2017). Another aspect to be explored concerning depressive symptoms is patients' belief of illness or illness perception or illness cognition. Illness cognition highlights the representation of cognitive and emotional elements that are dynamic in influencing a person's health behavior in facing disease threats (Ogden, 2012). According to Cameron and Leventhal (2003), illness cognition as the core of the Self Regulation Model (SRM) is a systematic process of setting goals, planning appropriate strategies to achieve, and evaluating goals and strategies to revise them. A conscious effort is involved in this systematic process of regulating thoughts, emotions, and behavior. Therefore, we were interested in studying how this systematic process occurred in each treatment phase experienced by patients by measuring illness cognition and analyzing its correlation with depression symptoms. Smallheer et al. (2018) recognized a correlation between illness cognition and subjective health in CHD patients; however, there was no direct relationship between illness cognition and depressive symptoms.

Furthermore, Illness cognition determines the adherence behavior of CHD patients to treatment (Leventhal et al., 1992; Evers et al., 2001; Shin et al., 2013), as well as depression (Shin et al., 2013; Vaccarino et al., 2020). Nevertheless, in Indonesia, the relationship between illness cognition and depressive symptoms in CHD patients has not been widely discussed in studies. As nurses play a role in preventing complications and increasing patient compliance in managing CHD, information about the relationship between these variables is beneficial, especially in depression prevention and intervention measures. Therefore, this study aimed to investigate the correlation between illness cognition and depressive symptoms among patients with CHD in Indonesia.

## Methods

### Study Design

This study used a correlational research design with a cross-sectional approach.

### Participants

The population was CHD patients who were undergoing treatment at a referral hospital in West Java, Indonesia. The sample selection using convenience sampling technique with inclusion criteria: 1) respondents aged at least 18 years; 2) respondent is undergoing treatment in one of the following areas of the cardiac care installation: Cardiac High Care Unit; non-intensive Cardiac Care Unit; Cardiac Rehabilitation Unit; and Cardiac Outpatient Unit. Exclusion criteria for potential respondents: 1) do not understand Bahasa Indonesia; 2) have a history of psychological or mental disorders.

The number of samples was determined using the sample size table for one correlation test. Utilizing an expected correlation between the two variables ( $r$ ) 0.778 from Smallheer et al. (2018), with a statistical power of

90%; alpha ( $\alpha$ ) 5%; and correlation coefficient of the null hypothesis ( $r$ ) 0.6, it was found that the number of minimum respondents needed was 56 (Bujang & Baharum, 2016), and a total of 106 respondents were involved in the study.

### Instruments

**Demographic questionnaire.** Respondents completed a demographic questionnaire that included age, gender, educational level, marital status, estimated monthly household income, and type of cardiac treatment.

**Beck Depression Inventory-II (BDI II).** We used The Beck Depression Inventory-II (BDI II) Bahasa Indonesia version to measure depression (Beck et al., 1996), which its validity value of  $r = .39 - .52$ ,  $p < .01$ , and Cronbach's  $\alpha$  of .90 (Ginting et al., 2013). The BDI II instrument categorized depression based on: not depression (0-13); mild depression (14-19); moderate depression (20-28); and major depression (29-63).

**Illness Cognition Questionnaire (ICQ).** Evers et al. (2001) developed the Illness Cognition Questionnaire (ICQ), consisting of 18 questions categorized into three dimensions: helplessness, acceptance, and perceived benefits. All questions were measured using a 1-4 Likert scale consisting of: Not at all (1); somewhat (2); to a large extent (3); and completely (4), which the higher the score indicates the higher acceptance, perceived benefits, and helplessness. In this study, we used the Bahasa Indonesia version of ICQ with permission from the original author. The construct validity of the Indonesian version of ICQ was .52 to .80. A reliability value for helplessness, acceptance and perceived benefits was .75, .69, and .70, respectively (Delima et al., 2018).

### Data Collection

Four final-year nursing students were involved as data collectors. Data collection was carried out from February to May 2017 at one of the referral hospitals in West Java, Indonesia. They have explained the research objectives and how to fill the instruments to respondents who meet the inclusion criteria.

### Data Analysis

Data were analyzed using SPSS version 25 software. Before analyzing the data, we tested the normality of the data on the variables: depression, acceptance, perceived benefits, and helplessness using Kolmogorov-Smirnov, and the results showed that the data were not normally distributed ( $p < .05$ ), so in this study, data processing used a non-parametric statistic. Data analysis in this study was divided into two stages. In the first stage, we described the characteristics of the respondents using the mean and standard deviations, median, and frequency distribution. In the second stage, we investigated the relationship between each dimension of illness cognition (acceptance, perceived benefits, and helplessness) and depression. We analyzed this second stage using Spearman-rank with a significance level of  $p < .05$ .

### Ethical Consideration

This study obtained ethics approval from the Research Ethics Committee of Universitas Padjadjaran No. 453 / UN6.C.10 / PN / 2017. All respondents had been informed and signed the consent form. In order to protect the respondents from harmful conditions, the data collection was conducted when the patients were reported free of chest pain. Additionally, the findings of this study are reported as grouped data. Therefore, participants' identification was anonymous.

### Results

A total of 106 respondents were involved in the study, consisting of 10% who were undergoing treatment at the High-care unit (HCU); 28% in non-high / Intensive Care Units; 39% in outpatient units; and 24% in the cardiac rehabilitation unit. Approximately three-quarters of the respondents are male (76%), and near a quarter (24%) are female. Moreover, almost all respondents were married (91%). Further information for the characteristics of respondents in this study can be seen in Table 1.

Table 1 Respondents' characteristics

Respondents' Characteristics	Univariate Analysis	
	<i>n</i>	%
<b>Age</b>	106	10
<b>Sex</b>		
Male	81	76.4
Female	25	23.6
<b>Marital Status</b>		
Married	91	85.8
Not married	1	.9
Widow/Widower	14	13.2
<b>Education Level</b>		
Not formally educated	1	.9
Elementary school	45	42.5
Secondary school	33	31.1
Higher education	27	25.5
<b>Estimated Monthly Household Income</b>		
Less than 2.8 million IDR	60	56.6
2.8 – 5 million IDR	32	30.2
More than 5 million	14	13.2
<b>Cardiac Care Installation</b>		
High care unit	10	9.4
Non-high/intensive care unit	30	28.3
Outpatient unit	41	38.7
Cardiac rehabilitation unit	25	23.6
<b>Type of Treatment</b>		
Medication	24	22.6
Medication, fibrinolysis	25	23.6
Medication, PCI	24	22.6
Medication, CABG	6	5.7
Medication, fibrinolysis, PCI	22	20.8
Medication, PCI, CABG	2	1.9
Medication, fibrinolysis, CABG	2	1.9
Medication, fibrinolysis, PCI, CABG	1	.9

**Table 2** Illness cognition among respondents

Illness Cognition Dimension	Mean	SD	Median	Min	Max
Helplessness	13.20	4.776	12	6	24
Acceptance	18.22	3.335	18	8	24
Perceived benefits	20.13	3.055	21	11	24

Table 2 shows that acceptance and perceived benefits have a mean and median close to the maximum ICQ score (ICQ max score 24). On the other hand, the mean and median scores of helplessness are close to the minimum

score ICQ (ICQ min score 6). These mean and median scores show that the respondents have high acceptance and perceived benefits also low helplessness.

**Table 3** Depression among respondents

Depression Category	Mean	SD	Median	Min	Max	N	%
No Depression						77	72
Mild Depression	10.18	7.402	8	0	33	16	15
Moderate Depression						9	9
Major Depression						4	4

Table 3 shows the incidence of depression in this study. Just above three-quarters of respondents had no depression, but less than a fifth experience mild depression

and a total of 12.3% of respondents had moderate to major depression.

**Table 4** Correlation between illness cognition and depression

Independent Variables	Depression Score P/Approx. sig	Correlation Coefficient (r)
Helplessness	.000	.437**
Acceptance	.221	-.120
Perceived benefit	.317	-.098

\*P/Approx. Sig <.05. | \*\*P/Approx. Sig <.01

Table 4 shows that of the three dimensions of illness cognition consisting of helplessness, acceptance, and perceived benefits, the helplessness dimension is the only dimension with a significant correlation with depression.

Also, the correlation coefficient (r) indicates a positive correlation between helplessness and depression with moderate correlation strength.

**Table 5** Item analysis: Correlation between items helplessness and depression

Items	Depression P/Approx. Sig	Correlation Coefficient (r)
1. Because of my illness, I miss the things I like to do most.	.001	.316**
5. My illness controls my life.	.023	.221*
7. My illness makes me feel useless at times.	.003	.286**
9. My illness prevents me from doing what I would like to do	.026	.217*
12. My illness limits me in everything important to me	.004	.276**
15. My illness frequently makes me feel helpless	.013	.240*

\*P/Approx. Sig <.05. | \*\*P/Approx. Sig <.01

Table 5 shows that all items on the helplessness variable are significantly associated with depression. However, items 1, 7, and 12 had a higher significant correlation than other items. The correlation coefficient of all items shows a positive correlation between each item with depression.

## Discussion

This study aimed to investigate the correlation between illness cognition and depression. Our study found that the

helplessness dimension of illness cognition had a significant correlation with depression. Thus, this study supported prior research, which stated that helplessness was associated with depressive symptoms in patients with myocardial infarction (Karademas & Hondronikola, 2010) and patients with other chronic diseases such as chronic renal failure (Theofilou, 2011) and rheumatoid arthritis (Kwan et al., 2014). However, this study differs from Smallheer et al. (2018) in terms of participants. Smallheer et al. (2018) investigated the relationship between helplessness and depression among patients diagnosed



with CHD for at least a year. In this study, participants were involved from the acute care phase (several days after a heart attack) to more than six months after being diagnosed with CHD. This result showed that helplessness could occur since the beginning of an acute attack of CHD; previous research even stated that helplessness was experienced by patients persistently over time (Karademas & Hondronikola, 2010).

Helplessness, based on this research, was the only dimension correlated with depression. According to Beck (as cited in Smallheer, 2011), depression results from an individual's negative assessment. In the context of helplessness studied, depression manifests an individual's failure to get a relationship between response and appropriate outcomes. This condition increases pessimistic beliefs about oneself and negatively affects one's motivation, cognition, and emotions. Smallheer (2011) confirmed that if a person often fails to get the expected results for the efforts made, helplessness will occur and lead to depression.

According to Capobianco et al. (2020), helplessness is a negative metacognitive belief. Furthermore, this leads patients to an inability to control disease (uncontrollability), which is related to the onset of depression. In this study, uncontrollability can be identified from all of the statements of helplessness (Table 5), which showed a significant correlation with depression; thus, this result upholds findings from Capobianco et al. (2020).

Another study explains that helplessness had an independent impact on negative subjective health, including physical functioning and emotional wellbeing (Karademas & Hondronikola, 2010). Moreover, Juergens et al. (2010) found a significant relationship between initial illness belief and physical function and disability in the recovery phase of CHD patients after CABG surgery; this relationship shows that illness belief is essential to improve physical function. Furthermore, an increase in physical function reduces the patient's helplessness, thus diminishing the risk of depression.

Nurses as care providers need to consider helplessness in managing CHD patients because it is correlated with depression. Nurses can opt for various interventions to reduce helplessness. According to Hermele et al. (2007), increasing a better understanding of the patient regarding the disease and the treatment through psycho-education can lessen helplessness. Capobianco et al. (2020) added that helplessness is a form of pessimism, and the way to increase it is by cultivating optimism instead of helplessness through metacognitive therapy. Juergens et al. (2010) also identified illness beliefs related to physical function and disability in the recovery phase of CHD patients following CABG. One of the efforts to reduce helplessness is through increasing physical function. Moreover, improving physical function in CHD patients can be achieved through cardiac rehabilitation (Sutantri et al., 2019; Nuraeni et al., 2020; Su et al., 2020). However, those interventions still require further investigation of their

influence on reducing helplessness among CHD patients in Indonesia.

Results also showed that acceptance and perceived benefits were not significantly correlated with depression. These may be attributable to several following explanations. According to Hirani and Newman (2005), acceptance is "Perceived ability to diminish, live with and master the aversive consequences of one's disease; recognizing the need to adapt to the chronic illness." While perceived benefits are "positive consequences arising from illness; benefits obtained, such as changes in life priorities and personal goals, positive personality changes, and stronger personal relationships." These two dimensions of illness cognition help deal with the disease. Furthermore, Karademas and Hondronikola (2010) state that acceptance was related to positive subjective health, which showed better physical function and emotional wellbeing.

### Study Limitation

The determination of the sample using convenience sampling in this study is acceptable considering the sample involved a vulnerable population. Furthermore, the sample representation that depicts each category of care installation in the study had not considered the proportion of the average number of patients treated in each service unit, thus affecting the generalizability of the findings.

### Conclusion

Based on three dimensions of illness cognition, helplessness was the most influential factor in depression among patients with CHD in Indonesia. Considering the adverse effects of depression, the factors that can reduce depression in CHD patients need to be identified and further explored to be used as potential measures in reducing the risk of depression.

### Declaration of Conflicting Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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### Authors' Contribution

AN provided article development, ideas, reviewed theories, and literature analyzed, interpreted data wrote, and made manuscript final approval. AA, AP, and DN designed the study, data analysis, revised manuscript, and made final approval of the manuscript. All authors contributed and agreed with the final version of the manuscript.

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## Data Availability Statement

All data generated or analyzed during this study are included in this published article (and its [supplementary information files](#)).

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