









Association between Illness Perception and Anxiety Undergoing Percutaneous Coronary Intervention in Patients with Acute Coronary Syndrome: A Pilot Study

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Abstract

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BACKGROUND: Patients' illness perceptions are thought to be associated with anxiety undergoing percutaneous coronary intervention (PCI) in patients with acute coronary syndrome (ACS).

AIM: This study aimed to determine the association between illness perception and anxiety undergoing PCI in patients with ACS.

METHODS: This study used a cross-sectional design and enrolled 50 hospitalized patients with ACS who underwent elective PCI between December 2019 and March 2020. The study instruments were the Brief-Illness Perception Questionnaire to evaluate illness perception and the Zung Self-Rating Anxiety Scale to evaluate patients' anxiety. Statistical analysis was performed using the Pearson correlation test with significance set as $p < 0.05$.

RESULTS: This study showed that 56% of respondents had positive perceptions toward their disease. The majority of respondents (94%) also indicated a low level of anxiety undergoing PCI. The Pearson correlation test results revealed a significant association between illness perception and the level of anxiety undergoing PCI in patients with ACS ($p = 0.043$; $r = 0.287$).

CONCLUSION: There is a significant association between illness perception and anxiety undergoing PCI in patients with ACS. The positive perceptions led to lower patients' anxiety, and *vice versa*.

Introduction

Acute coronary syndrome (ACS) is the most common cause of mortality and disability globally [1]. It is responsible for one-third of all deaths in middle adulthood, and the morbidity and mortality rates are continuously increasing [2]. Despite the fact that percutaneous coronary intervention (PCI) is safe and promising toward successful reperfusion therapy, some significant adverse effects such as perforations, dissections, hemodynamic collapse, no-reflow, and entrapped equipment may occur due to the complexity of the procedure [3]. In addition, the potential of adverse effects can lead to patients' anxiety [4].

The previous study showed that 24–72% of patients who will undergo PCI tend to experience anxiety symptoms [5]. The symptoms of patients' anxiety include excessive fear of the therapeutic procedure, feelings of tension, fear of uncertainty about the disease, feeling

excessive pain, and excessive worrying before patients undergo PCI [6]. In addition, another study has revealed that anxiety in patients with ACS is correlated with the decrease in cardiovascular physiological function, such as arrhythmia and cardiac-pump failure and may cause deterioration of the coronary artery vascularization [7]. Anxiety leads to a rapid cardiac rhythm, hypertensive crisis, arrhythmia, immunity decrease, insomnia, pain-related anxiety, and prolonged hospitalization [8], [9]. One of the factors thought to trigger anxiety undergoing PCI is patients' illness perception [10].

The patients' illness perception is associated with the assessment of health issues arising from the disease, and such perceptions affect their well-being [11]. Having adequate information about the disease significantly affects the patient's reaction to the disease and will enhance positive coping [12]. Furthermore, insufficient patient knowledge leads to an increase in anxiety, depression, and ultimately causing poor patient satisfaction with health care [13].

It is essential to identify the association between patients' illness perception and anxiety undergoing PCI in patients with ACS. Relevant literatures have shown that there is a limited number of studies identifying the association between illness perception and anxiety in patients with ACS. Therefore, this study was conducted to determine the association between illness perception and anxiety undergoing PCI in patients with ACS.

Materials and Methods

Study population, sampling, and time frame

This observational study used a cross-sectional design. Data collection was conducted between December 2019 and March 2020, enrolled 50 hospitalized patients with ACS who will undergo PCI at the tertiary hospital in Indonesia. The inclusion criteria in this study were as follows: patients aged 18 years; indicated to undergo an elective PCI procedure; elective PCI was indicated based on the results of coronary angiography; and individuals are willing to participate in psychological evaluations. Meanwhile, the exclusion criteria included a history of at least one of the following conditions: mental illness or a history of prophylaxis for mental illness; emergency conditions; and cognitive impairment. In addition, individuals who are unable to complete a psychological evaluation due to severe illness, surgical emergency, or lack of cooperation were not included in the study.

The questionnaire

This study used two instruments, namely, the Brief-Illness Perception Questionnaire (B-IPQ) and the Zung Self-Rating Anxiety Scale. The first instrument is the B-IPQ questionnaire that was developed by Broadband in 2006 to assess patients' perceptions of their illness [14]. The B-IPQ consists of eight question items and one essay question with nine dimensions, namely, consequences, timeline, personal control, treatment control, identity, concern, coherence, emotional representation, and causal. The lower score indicates better patients' perception. The B-IPQ has a validity value >0.3 and a Cronbach alpha coefficient of 0.807.

The second instrument is the Zung Self-Rating Anxiety Scale, which was developed by Zung in 1971, which is used to measure a person's level of anxiety [15]. The Zung Self-Rating Anxiety Scale consists of 20 question items and uses a Likert scale with four answer choices ranging from "rarely experienced" to "always experience." The higher score indicates the higher level of anxiety. The Zung Self-Rating Anxiety Scale has been

translated into Indonesian using the backward-forward translation method developed by Brislin in 1976, and a content validity test was conducted with an S-CVI value of 1.00 [16], [17].

Statistical analysis

We used descriptive statistics to analyze the data. Frequency distribution and percentages were used to report participant sociodemographic characteristics (gender, age, education, and history of ACS attacks) and to show the result of illness perception and anxiety variables. Mean and standard deviation were used to analyze the association of both variables. The Pearson test's bivariate statistical analysis was performed using the SPSS v.23 (IBM Corp, Armonk, NY).

Ethical approval

The Institutional Ethics Committee approved the study on June 18, 2019 with the ethical expediency number KE/FK/0638/EC/2019. The study was conducted according to the Declaration of Helsinki on Biomedical Research Involving Human Subject. In addition, all respondents were enrolled after providing written informed consent. The collected data would be kept confidential and anonymous.

Results

Table 1 depicts the characteristics of the respondents. In this study, the majority of the respondents were male ($n = 35$, 70%) and had a college education ($n = 23$, 46%). In addition, most of the respondents were older adults (46–65) ($n = 39$, 78%) with mean age were 58.94 ± 8.188 years and had a history of a first heart attack ($n = 31$, 62%).

Table 1: Frequency distribution of respondent characteristics (n = 50)

| Respondent characteristics | Frequency | Percentage |
|--|-----------|------------|
| Gender | | |
| Male | 35 | 70 |
| Female | 15 | 30 |
| Age (mean \pm SD = 58.94 ± 8.188) | | |
| Adult (26–45 years old) | 2 | 4 |
| Older adult (46–65 years old) | 39 | 78 |
| Elderly (>65 years old) | 9 | 18 |
| Education | | |
| Elementary school | 7 | 14 |
| Junior high School | 2 | 4 |
| Senior high School | 18 | 36 |
| College | 23 | 46 |
| Previous ACS attack | | |
| None | 6 | 12 |
| First ACS attack | 31 | 62 |
| Second ACS attack | 10 | 20 |
| Third ACS attack | 2 | 4 |
| >3 ACS attack | 1 | 2 |

ACS: Acute coronary syndrome; SD: Standard deviation.

Based on the analysis results listed in Table 2, 28 out of 50 respondents (56%) had positive

Table 2: Distribution of disease perception based on respondent characteristics (n = 50)

| Respondents' characteristics | Had positive perception f (%) | Had negative perception f (%) |
|--|-------------------------------|-------------------------------|
| Patients' illness perception (all) | 28 (56) | 22 (44) |
| Age | | |
| Adult (26–45 years old) | 0 | 2 (9) |
| Older adult (46–65 years old) | 22 (79) | 17 (77) |
| Elderly (> 65 years old) | 6 (21) | 3 (14) |
| Gender | | |
| Male | 22 (79) | 13 (59) |
| Female | 6 (21) | 9 (41) |
| Education | | |
| Elementary school | 5 (18) | 2 (9) |
| Junior high school | 2 (7) | |
| Senior high school | 9 (32) | 9 (41) |
| College | 12 (43) | 11 (50) |
| Previous ACS attack | | |
| None | 3 (11) | 3 (14) |
| First ACS attack | 18 (64) | 13 (59) |
| Second ACS attack | 5 (18) | 5 (23) |
| Third ACS attack | 2 (7) | 0 |
| >3 ACS attack | 0 | 1 (4) |
| Factors caused illness (according to the respondents' responses) | | |
| Unhealthy lifestyle | 24 (48) | |
| Stress | 11 (22) | |
| Other cardiovascular diseases | 10 (20) | |
| Genetics | 5 (10) | |

ACS: Acute coronary syndrome; f: Frequency.

perceptions. The results also indicate the perception of disease based on the characteristics of the respondents in the excellent category. Another result described how the patients assumed that their disease is caused by an unhealthy lifestyle (e.g., smoking, poor diet, and lack of physical activity) (48%), stress (22%), other cardiovascular diseases (e.g., diabetes, cholesterol, and hypertension) (20%), and genetics (10%). Moreover, the study also showed that 47 of the 50 respondents (94%) had an anxiety level score in the normal range. The analysis results showed that the overall level of anxiety based on the characteristics of the respondents was in the normal range (Table 3).

Table 3: The description of the level of anxiety based on the characteristics of the respondents

| Respondents' characteristics | Normal f (%) | Low level anxiety |
|--|--------------|-------------------|
| The anxiety level of patients who will undergo PCI | 47 (94) | |
| Age | | |
| Adult (26–45 years old) | 2 (4) | 0 |
| Older adult (46–65 years old) | 36 (77) | 3 (100) |
| Elderly (>65 years old) | 9 (19) | 3 |
| Gender | | |
| Male | 33 (70) | 2 (67) |
| Female | 14 (30) | 1 (33) |
| Education | | |
| Elementary school | 6 (13) | 1 (33) |
| Junior high school | 2 (4) | 0 |
| Senior high school | 16 (34) | 2 (67) |
| College | 23 (49) | 0 |
| Previous ACS attack | | |
| None | 6 (13) | 0 |
| First ACS attack | 29 (62) | 2 (67%) |
| Second ACS attack | 10 (21) | 0 |
| Third ACS attack | 2 (4) | 0 |
| >3 ACS attack | 0 | 1 (33%) |

ACS: Acute coronary syndrome; PCI: Percutaneous coronary intervention.

The Pearson test results indicated a significant association between illness perception and the level of anxiety undergoing PCI in patients with ACS ($p = 0.043$; $r = 0.287$). Furthermore, the direction of the positive correlation showed a unidirectional association. The positive illness perception led to lower patients' anxiety, and *vice versa*. The Pearson test showed a correlation coefficient of $r = 0.287$, which indicates a small

Table 4: Association of disease perception variables and anxiety levels (n = 50)

| Variables | Mean \pm SD | p-value | Correlation Coefficients (r) |
|------------------------------|--------------------|---------|------------------------------|
| Patients' illness perception | 44.80 \pm 15.102 | 0.043 | 0.287 |
| Anxiety undergoing PCI | 35.48 \pm 6.753 | | |

PCI: Percutaneous coronary intervention; SD: Standard deviation.

correlation between illness perception and patients' anxiety (Table 4).

Discussion

Our study demonstrated that most respondents had a positive perception of their illness. The patient's perception of illness is formed based on their beliefs and perceived information about their condition and can affect the individual's mental health and how the patient deals with the medical condition [18]. The Self-Regulation Model (SRM) developed by Leventhal indicated that when patients experience a disease, such as ACS, they actively create cognitive representations of their disease [19], [20].

Most of the respondents formed a positive perception, because they have been given an education from doctors and nurses about ACS and PCI procedures before starting therapy to have better knowledge about their disease. In addition, most of the respondents have also had a heart attack before where this experience will help patients to understand their disease. Patients who received health education at follow-up had a significant interaction effect on improving personal control and treatment [21], [22]. It can be related to the efficacy of patient health education in increasing the patient's perception of his illness [23], [24].

Our study revealed that the analysis of anxiety level scores showed that most of the respondents had anxiety levels in the normal range. However, most respondents had experienced a heart attack in this study. This experience will increase knowledge and help patients understand the disease they are experiencing so that most respondents do not experience anxiety [25]. In addition, most of the respondents' ages in this study were older adults, which is a mature age in life (78%). Older adults tend to have personality maturity, so they are less likely to experience distress because they have adequate adaptability to stressors. In addition to some of the factors already mentioned, family support also helps the patient reduce anxiety and relieves stress experienced by patients before undergoing medical treatment [26], [27].

Most of the respondents had normal anxiety levels due to their higher education. According to a previous study, anxiety is often experienced by patients with low levels of education and poor knowledge about their illness [28]. It is because they have limited coping skills compared to people with high levels of education [29]. Individuals with higher education can

adopt various coping strategies to solve problems, including seeking social support and making changes to improve stressful situations [30]. They also understand information objectively and avoid negative views so they will not experience high anxiety [31].

The Pearson correlation test results showed a significant association between illness perception and anxiety in ACS patients who will undergo PCI. These results follow the statement of Al-Smadi *et al.* that the perception of illness is a factor in anxiety. When a person perceives something unconsciously in the brain, there is also a process of forming a thought pattern that will affect the affective response [32]. The affective response generated will also be better if someone perceives something positively [33], [34]. The correlation test results are also due to the personal control aspect of the disease perception variable, which explains a person's beliefs about healing and self-control against their illness. This belief certainly affects the emergence of anxiety in a person [35].

The association between illness perception and patients' anxiety makes these two factors crucial, because they impact a person's emotions and behavior. Patients who will undergo PCI with positive perceptions and normal anxiety levels seem to be much more prepared to undergo treatment, because positive perceptions and the absence of anxiety make their emotional condition more stable [36]. A stable emotional condition also increases the patient's long-term confidence in maintaining their mental health [37]. If someone perceives something positively, the affective response generated will also be positive [38]. In addition, positive perceptions can also help someone understand the situation that they are experiencing so that the process of emotion regulation also tends to be good [39].

The correlation test results are also due to the personal control aspect of the disease perception variable, which explains a person's beliefs about healing and self-control against disease. Beliefs about healing and self-control are the aspects that most influence how anxious a person feels [40]. Therefore, health care professionals must increase patients' belief in healing diseases to reduce their anxiety [41].

This study had a few limitations. This study was a cross-sectional and single-center study and our study subject population was small. Thus, it was not easy to draw definitive conclusions from the results. Therefore, conducting a multi-center study with a larger sample size should be considered in the future.

Conclusion

There is a significant association between illness perception and anxiety undergoing PCI in

patients with the ACS. The positive perception led to lower patients' anxiety, and *vice versa*. In addition, this study is valuable in shedding light on the need for a multi-center study with a higher number of participants.

Recommendations

Healthcare professionals are expected to improve illness perception and decrease anxiety by providing patients with exemplary education and psychological support. Moreover, future research with a higher population and a better study design is needed to discover more about anxiety in patients with STEMI who will undergo PCI. For instance, factors are associated with anxiety in patients with STEMI who will undergo PCI.

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Authors' Contributions

Conceptualization: BFA and FR; Data curation: ASF and SS; Formal analysis: SS and SS; Investigation: RFK and FR; Methodology: BFA and SS; Project administration: ASF; Resources: SS and SS; Software: RFK; Supervision: BFA; Validation: BFA; Roles/Writing - original draft: BFA and FR; Writing - review & editing: BFA and RFK. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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