Illness Perceptions in Patients with Coronary Artery Disease in a Private Hospital in Malaysia

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ABSTRACT

Background: The prevalence of Coronary Artery Disease (CAD) makes it a significant public health concern. Studies on illness perceptions have established a clear correlation between patients' beliefs and the outcomes of their recovery from various illnesses and risk factors. As a result, gaining a deeper understanding of patients' illness perceptions of CAD is imperative for nurses, as it enables them to provide more tailored education and interventions. This, in turn, can improve patient outcomes and reduce the overall burden of CAD. **Aim**: The study aims to determine the illness perceptions in patients with coronary artery disease in an outpatient setting in Malaysia's private hospital. **Method**: A cross-sectional study design was used with a non-probability and non-randomized sampling method. Data was collected in 2018 through the self-administered Illness Perception Questionnaire-Revised (IPQ-R). **Resul**ts: A convenience sample of 117 patients (40.2 female, 59.8% male) filled out the questionnaire with a primary diagnosis of coronary artery disease. The questionnaire assessed illness perception in terms of seven core dimensions. CAD patients in Malaysia understand the chronicity of their disease. Also, CAD patients in the current study seemed to believe that many of the causes of their illness were under their control. However, they did not appear to believe that the symptoms were related to their illness. **Conclusion**: The current study described the illness perception of CAD patients in the outpatient setting of a private hospital in Malaysia. The findings were positive overall; however, the patients seemed confused about their disease's nature. Hence, as the most trusted healthcare provider, nurses can significantly influence patients' illness perception by providing better education interventions. This will improve quality of life, minimize hospitalization, and enhance medication adherence. More prospective studies are mandated in the future to design superior interventional models that can be used to develop patients' perceptions.

Keywords: Illness Perception; Coronary Artery Disease; Malaysia; Outpatient; Beliefs.

INTRODUCTION

Coronary artery disease (CAD) is characterized by atherosclerosis in coronary arteries and can be asymptomatic; and is usually used to refer to the pathologic process affecting the coronary arteries, while coronary heart disease includes the diagnosis of myocardial infarction, angina pectoris, and silent myocardial ischemia. Coronary heart disease mortality results from coronary artery disease events (1). An estimated 17.7 million people died from cardiovascular diseases in 2015, one of Malaysia's leading causes of death since early 1980(s) (2).

Understanding patients' experiences of their illnesses is important for coronary heart disease prevention and education (3). The term' Illness perceptions' refers to the organized beliefs that patients build up about the characteristics of their illness (4). Leventhal et al. (1984) identified five core dimensions. These were: beliefs about commonly experienced symptoms (identity), perceived duration of the illness (Timeline), casual factors (casual attributions), expected effects and outcome of the illness (consequences), and durability and controllability (control/cure), which can help individuals to make sense of their sickness and give a foundation for their coping

responses (5). A later study by Leventhal et al. (1998) highlighted the importance of the patient's understanding of the illness (illness coherence) and the emotional impact of the illness (emotional representation) (6).

Some sources claim that CAD patients' illness perception is influenced by socio-demographic factors such as age and gender (7). In addition, negative perceptions and depression are due to old age and low economic status after the onset of CAD (8).

The primary objective of this study is to explore and assess the illness perceptions of patients diagnosed with Coronary Artery Disease (CAD) in an outpatient setting within a private hospital in Malaysia. This research aims to shed light on patients' understanding and beliefs regarding their illness, which can inform the development of targeted interventions and educational programs for CAD patients in this particular setting. The outcome of this study has the potential to contribute to improving patient outcomes and reducing the burden of CAD in Malaysia.

The nurse is the main focus of this topic because they play a crucial role in caring for and treating patients with Coronary Artery Disease (CAD) (9). Nurses are often the first point of contact for patients and are uniquely positioned to assess and understand patients' illness perceptions and beliefs. By doing so, they can provide targeted education and interventions that can positively impact patient outcomes. Furthermore, nurses are responsible for developing and implementing treatment plans considering patients' unique needs and perspectives. In the context of CAD, understanding patients' illness perceptions is critical in determining the effectiveness of a treatment plan and improving overall health outcomes (10, 11). Given these important responsibilities, nurses are a natural focus for studies examining illness perceptions in patients with CAD and the impact of these perceptions on treatment outcomes.

The present study examines the illness perceptions of patients with Coronary Artery Disease (CAD) in Malaysia. A deeper understanding of these perceptions can enable nursing professionals to provide more individualized education and interventions to these patients. In addition, by considering the differences among patients and the relationships between illness perceptions and various variables, this study aims to identify how illness perceptions can impact treatment outcomes. The improvement of patients' perceptions toward their illness is expected to positively impact their health-related quality of life and clinical outcomes, including reducing disease progression, increasing medication adherence, and improving overall well-being.

The significance of this study lies in its potential to guide professionals in reducing the incidence of CAD in Malaysia. Despite the lack of previous research on illness perceptions in CAD and its relationship with symptoms and causes, this study is poised to fill that gap and inform clinical practice. Additionally, incorporating an understanding of illness perceptions into a treatment plan can help patients overcome negative beliefs about their illness and improve their outcomes. In light of these considerations, this study is crucial in advancing our understanding of the role of illness perceptions in treating CAD in Malaysia.

METHODS

Study design

A quantitative study focused on variables between the illness perception and the coronary artery disease patients' socio-demographics at a private hospital in Cardiac Vascular Sentral Kuala Lumpur (CVSKL). The quantitative approach used in this study is a cross-sectional study.

Study Setting

This study was conducted in Cardiac Vascular Sentral Kuala Lumpur, Malaysia (CVSKL). Cardiac Vascular Sentral Kuala Lumpur (CVSKL) is an integrated Cardiac Vascular Hospital specializing in comprehensive modern care for cardiac and vascular diseases patients. The researchers only focused on the outpatient department where patients are being consulted on average per day, around 174 patients with 10 clinics.

Sampling and sample size calculation

A convenience sampling method was used to recruit the Cardiac Vascular Sentral Kuala Lumpur patients. All outpatients from

this private hospital who met the inclusion criteria from 1ˢᵗ September 2018 until 31ˢᵗ October 2018 were eligible to participate in the study. Patients aged 30 years old and above with existing coronary artery disease and with newly diagnosed coronary artery disease after the angiogram, patients confirmed as coronary artery patients via angiogram procedure, CAD patients with a pre-existing medical condition of hypertension, high cholesterol, diabetes, and obesity, and patients who were willing to participate voluntarily in the study were included in the study. On the other hand, patients who have undergone coronary artery bypass grafts had a pacemaker, or had congenital heart problems were excluded. Also, as the questionnaire is in English, the participant must speak English to be included in the study.

Based on the sample size calculation below, the required sample is 138 patients estimated total population.

$$Sample\ Size = \frac{Z^2 \times P \times (1 - P)}{d^2}$$
$$= \frac{1.96^2 \times 0.1 \times (1 - 0.1)}{0.05^2}$$
$$= 138\ patients$$

According to a literature review, the prevalence of CAD in Malaysia ranges from 10% to 20% (12-14). These studies provided valuable insights into the prevalence of CAD in Malaysia. However, the percentage can vary based on different populations and study designs. Nevertheless, these studies generally suggest that CAD is a significant health issue in Malaysia, affecting a substantial proportion of the population.

Z-score is 1.96 for a confidence level of 95%, (d) margin of error is 5%, and the proportion of CAD (p) was assumed to be 10% from the literature review.

Study tool

The current study adopted the illness perception questionnaire – revised (IPQ-R) as a self-administered tool for data collection. IPQ-R is 38 items and consists of 3 sections. (15, 16)

The IPQ-R is divided into three sections, with the identity and causal dimensions presented separately from the other dimensions. The identity sections are presented first and consist of 14 commonly experienced symptoms. The identity of symptoms was rated using two questions, whether they have experienced or not each of the symptoms since their illness using a yes/no response. The second question asked whether they believe the symptom is specifically related to their illness using the same yes/no response format.

The following sections of illness perception consist of 38 questions. They are divided into 7 dimensions of patient's perception in controlling the disease (personal control (beliefs about the control they have controlling their condition and symptoms), treatment control (belief of usefulness of the treatment they are receiving), timeline acute/chronic (length of time that the patients believe the disease will last), timeline cyclical (patient's perception about the patterns of how they are feeling), consequences (patient's expected outcomes and effects in CAD), illness coherence (an overriding dimension of how much patients understand/ comprehend about their illness), emotional representation (affective responses which are sensitive to illness perception and to predict health-related responses). Using a 5-point Likert scale, strongly disagree, disagree, neither agree nor disagree, agree, strongly agree. Each subscale scored separately, with some – reverse scoring required.

The final sections are the cause of the illness, consisting of 18 items using the same Likert-type scale. In these sections, the causes of the illness are divided into four subgroups that patients will consider the cause of their illness: psychological attributions, risk factors, immunity, accident, or chance. Moreover, the patient must list the three main causes of their illness.

The pilot study was taken at another private hospital, Penang Adventist Hospital, whose center of excellence is called Adventist Heart Centre. This ensures that the patient clearly and easily understands all items in the research instruments. The sample was 10% of the actual sample size. Hence, 17 patients filled in the questionnaire, and a preliminary analysis was done. No modifications were made to the research instrument's layout and presentation. The patients who participated in the pilot study were not included in the main

study, and the data obtained from the pilot study was not included in the main analysis.

Statistical analysis

Statistical Package for the Social Sciences Processor (SPSS, version 25.0) was used for the analysis. Descriptive statistics, including means, standard deviation, frequencies, and percentages, analyze all the demographic variables and the scores obtained from the IPQ-R items. The chi-square analysis test analyzed the correlation between dependent and independent variables—the statistically significant chi-square statistic value for $p=0.05$ (confidence level of 95%).

According to the authors of the IPQ-R, the researcher using various assessment techniques may suggest that patients cluster their ideas about an illness around the five coherent components. These components make up the patient's perception of their illness. These components provide a framework for the patients to make sense of their symptoms, health risks, and direct action and coping. Each component holds a perception of one aspect of the illness, and together they provide the individual's coherent view of the illness. The higher scores on the identity, timeline, consequences, and cyclical dimensions represent the strongly held belief about the number of symptoms attributed to the illness, the chronicity of the condition, the negative consequences of the illness, and the cyclical nature of the condition. Where else high scores on the personal

control, treatment control, and coherence dimensions represent positive beliefs about the controllability of the illness and a personal understanding of the condition. The authors also reminded us that 13 items fall under the reverse score. Every item in the questionnaire section B is distributed into 7 subgroups with 38 items. The items will then be answered by giving a scale from 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, and 5=strongly agree. In section A, the coding for the identity scale yes=0, no=1 is divided into two columns: the symptoms that the participating patient may or may not experience since their illness.

RESULTS

120 Illness Perception Questionnaire-Revised (IPQ-R) packages were delivered to the outpatients of Cardiac Vascular Sentral Kuala Lumpur, and 120 questionnaires were returned with a response rate of 100%. From the returned questionnaires, only 3 respondents failed to complete the questionnaire or had left a page unanswered and therefore were withdrawn from the study, resulting in only 117 respondents, a final response rate of 97.5%.

Participants' socio-demographic

This study included a total of 117 respondents. Their distributions were by age, gender, race, marital status, family history, occupation, and education, as shown in (Table 1).

Table (1): Socio-demographic of patients (n = 117).

Variables	Characteristics	Frequency	Percentage
Age	30 – 39	18	15.4
	40 – 49	33	28.2
	50 – 59	31	26.5
	60 – 69	30	25.6
	70 -75	5	4.3
Gender	Female	47	40.2
	Male	70	59.8
Race	Malay	11	9.4
	Chinese	80	68.4
	Indian	19	16.2
	Other	7	6
Marital status	Single	19	16.2
	Married	94	80.3
	Widow	4	3.4
Family History	Hypertension	103	88

Variables	Characteristics	Frequency	Percentage
	Diabetes	73	62.4
	Dyslipidemia	28	23.9
	Heart Disease	90	76.9
Occupation	Student	1	0.9
	Self-employed	49	41.9
	Employee	44	37.6
	Unemployed	23	19.7
Education	Illiterate	2	1.7
	Primary	2	1.7
	Secondary	4	3.4
	College/ University	109	93.2

Association between Symptoms and Perceived Coronary Artery Disease (CAD)

The figure (Figure 1) below presents the percentage of patients with coronary artery disease (CAD) who reported various symptoms and their perception of the relationship between those symptoms and their CAD.

For example, 61.5% of patients reported experiencing pain, and 59.8% related it to their CAD. The same pattern is observed for other symptoms, such as breathlessness, weight loss, fatigue, and sleep difficulties, with most patients relating those symptoms to their CAD. On the other hand, for some symptoms, such as sore throat, irritated eyes, and wheezing, only a minority of patients perceived a relationship between those symptoms and their CAD.

The data in this figure highlights the wide range of symptoms that CAD patients can experience and the varying degrees to which patients perceive those symptoms as related to their CAD. These results could be useful for healthcare providers in understanding patients' perceptions and experiences and developing appropriate management strategies.
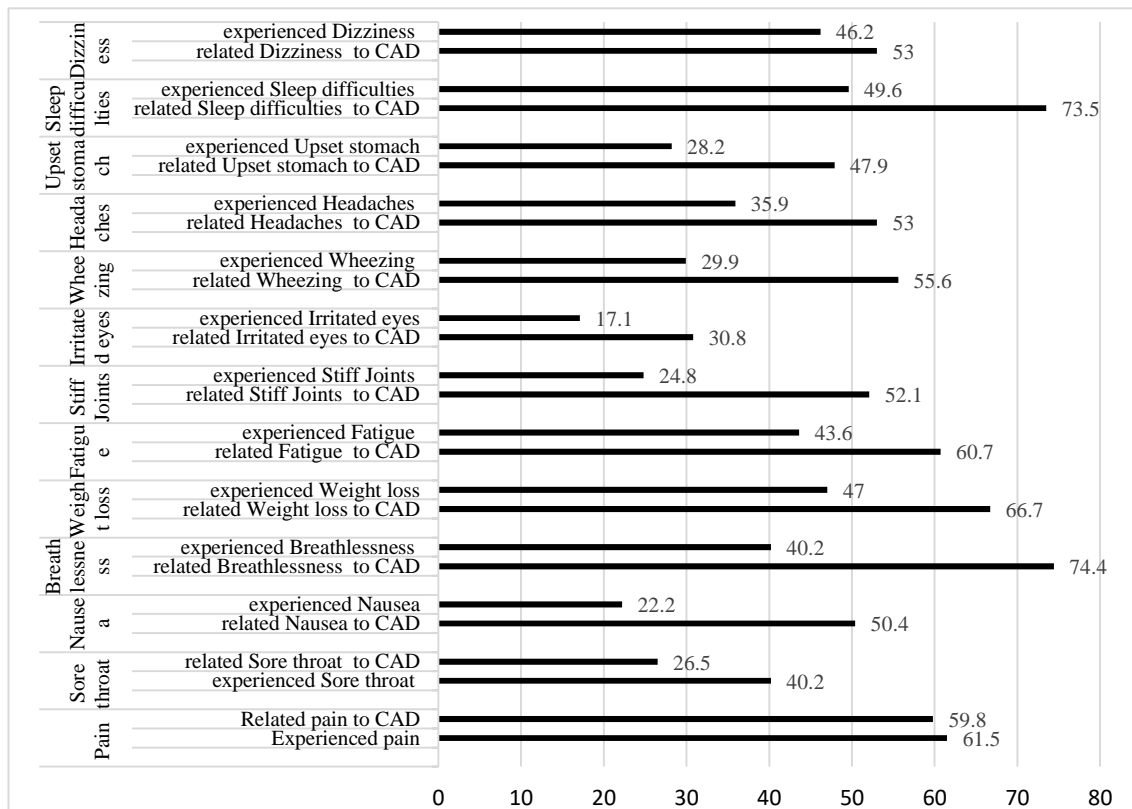

Figure (1): Common Symptoms and Their Perceived Association with Coronary Artery Disease.

IPQ-R seven core factor items

The means and standard deviations for the IPQ-R dimensions are shown in (Table 2). The higher the mean of a certain domain, the higher it affects patients' perception. Table 2 reveals that emotional representativeness has the greatest impact on patients' perception, followed by acute or chronic disease consequences and personal control, regarding their illness perception of CAD. Conversely, the cyclical nature of the disease has the least effect on patients' perceptions.

Higher scores on the consequences, timeline, and identity subscales reflect more negative beliefs, whereas a higher score on the control/cure subscale reflects more positive beliefs.

Based on the data presented in the table, the emotional representativeness of a traumatic event has the most significant influence on how an individual perceives that event.

This means that the event's emotional impact is the most important factor in shaping the individual's perception of the event and its aftermath.

In addition, the acute or chronic consequences of the event and the individual's sense of personal control also significantly impact their perception of the event. Conversely, the cyclical nature of the event has the least impact on the individual's perception.

The high scores on the "Consequences," "Timeline," and "Identity" subscales suggest more negative beliefs about the event, while a higher score on the "Control/Cure" subscale suggests more positive beliefs. This suggests that individuals with greater control over the event and its consequences and those with more positive beliefs about the potential for treatment and cure are likely to have a more positive perception of the event.

Table (2): Scores of IPQ-R dimensions.

	Possible score range	Minimum	Maximum	Mean	±SD
Timeline (acute/chronic)	6-30	13	28	20.35	3.83
Timeline Cyclical	4-20	6	19	15.70	2.48
Consequences	6-30	12	29	20.62	2.97
Personal Control	6-30	12	30	20.07	3.88
Treatment Condition	5-25	10	24	16.89	2.85
Illness Coherence	5-25	7	25	17.91	3.05
Emotional Representativeness	6-30	11	30	22.79	4.03

Illness perceptions correlations

Pearson correlation was used to analyze the associations among the different perception parameters. The findings are shown in (Table 3).

The correlation coefficient between timeline (acute/ chronic) and Timeline Cyclical is -0.081, and the p-value is 0.383, indicating a weak, negative relationship between the two variables. This means that as the timeline becomes more acute (i.e., short-term), the cyclicality of the timeline becomes less pronounced. However, this relationship is not statistically significant (as indicated by the high p-value).

In addition, Timeline (acute/ chronic) and Consequences had a weak, positive relationship (r = 0.08, p-value = 0.39). This means that as the timeline becomes more acute, the consequences of the condition become more pronounced. However, this relationship is not statistically significant. In contrast, Timeline (acute/ chronic) and Personal Control had a moderate, negative relationship, which implies that as the timeline becomes more acute, personal control over the condition decreases. However, this relationship is not statistically significant (P>0.05).

On the other hand, the correlation coefficient between the timeline (acute/ chronic) and Treatment Condition is 0.252, and the p-

value is 0.006, indicating a moderate, positive relationship between the two variables. As the timeline becomes more acute, the treatment condition becomes more explicit. Again, this relationship is statistically significant.

Furthermore, there is a weak positive correlation between "Consequences" and "Treatment Condition" (r = 0.216, p < 0.05). Likewise, there is a moderate negative correlation between "Personal Control" and "Illness Coherence" (r = -0.131, p < 0.05). Also, there is a strong negative correlation between "Emotional Representativeness" and "Illness Coherence" (r = 0.158, p < 0.05).

The emotional representation of illness was found to correlate with illness coherence negatively. Individuals with a clearer understanding of their illness showed fewer negative emotions and were less likely to perceive it as unpredictable or having severe consequences. On the other hand, illness coherence was positively linked with the belief that the treatment could control the illness (p = 0.019) and with personal control over the treatment (p = 0.004).

Table (3): Pearson Correlation among parameters IPQ-R (N=117).

		Timeline (acute/ chronic)	Timeline Cyclical	Conse-quences	Personal Control	Treatment Condition	Illness Coherence	Emotional Representativeness
Timeline (acute/ chronic)	correlation coefficient		-0.081	0.08	-0.152	0.252	-0.066	0.073
	p-value		0.383	0.39	0.101	**0.006**	0.481	0.435
Timeline Cyclical	correlation coefficient	-0.081		0.159	0.108	0.169	-0.135	0.108
	p-value	0.383		0.088	0.248	0.068	0.148	0.244
Consequences	correlation coefficient	0.08	0.159		0.190*	0.147	0.071	0.019
	p-value	0.39	0.088		**0.04**	0.115	0.446	0.842
Personal Control	correlation coefficient	-0.152	0.108	0.19		0.292**	0.262	-0.035
	p-value	0.101	0.248	**0.04**		**0.001**	**0.004**	0.709
Treatment Condition	correlation coefficient	0.252	0.169	0.147	0.292**		0.216	-0.094
	p-value	**0.006**	0.068	0.115	**0.001**		**0.019**	0.312
Illness Coherence	correlation coefficient	-0.066	-0.135	0.071	0.262	0.216		-0.131
	p-value	0.481	0.148	0.446	**0.004**	**0.019**		0.158
Emotional Representativeness	correlation coefficient	0.073	0.108	0.019	-0.035	-0.094	-0.131	
	p-value	0.435	0.244	0.842	0.709	0.312	0.158	

Analysis of causes of CAD

Analysis of the third part of the IPQ-R (causal attributions) revealed some causal factors the patients believed ("agree" or "strongly agree") were related to their illness: stress or worry (95.7%) and dietary habits (88%) followed by overwork (83.3%) and family problems (81.2%). Alcohol and smoking were not at the top of patients' list as causes of their disease (59%, and 72.2%, respectively). On the other hand, the patients disagree that CAD is caused by germs (60.6%). (Table 4) shows the proportion of each cause from the patients' perspective.

Table (4): IPQ-R causes scores (n=117).

Variables	Items	Freq.	(%)
Stress or worry	Strongly Disagree	3	2.6
	Disagree	0	0
	Neither Agree Nor Disagree	2	1.7
	Agree	62	53
	Strongly Agree	50	42.7
Hereditary - it runs in my family	Strongly Disagree	1	0.9
	Disagree	32	27.4
	Neither Agree Nor Disagree	6	5.1
	Agree	54	46.2
	Strongly Agree	24	20.5
A germ or virus	Strongly Disagree	19	16.2
	Disagree	52	44.4
	Neither Agree Nor Disagree	3	2.6
	Agree	29	24.8
	Strongly Agree	14	12
Diet (eating habits)	Strongly Disagree	4	3.4
	Disagree	7	6
	Neither Agree Nor Disagree	3	2.6
	Agree	64	54.7
	Strongly Agree	39	33.3
Chance (bad luck)	Strongly Disagree	20	17.1
	Disagree	47	40.2
	Neither Agree Nor Disagree	10	8.5
	Agree	24	20.5
	Strongly Agree	16	13.7
Poor medical care in my past	Strongly Disagree	3	2.6
	Disagree	17	14.5
	Neither Agree Nor Disagree	13	11.1
	Agree	50	42.7
	Strongly Agree	34	29.1
Pollution in the environment	Strongly Disagree	7	6
	Disagree	36	30.8
	Neither Agree Nor Disagree	10	8.5
	Agree	49	41.9
	Strongly Agree	15	12.8
My mental attitude, e.g., thinking about life negatively	Strongly Disagree	16	13.7
	Disagree	36	30.8
	Neither Agree Nor Disagree	10	8.5
	Agree	42	35.9
	Strongly Agree	13	
My behavior	Strongly Disagree	9	7.7
	Disagree	17	14.5

Variables	Items	Freq.	(%)
	Neither Agree Nor Disagree	6	5.1
	Agree	63	53.8
	Strongly Agree	22	18.8
Overwork	Strongly Disagree	3	2.6
	Disagree	9	7.7
	Neither Agree Nor Disagree	7	6
	Agree	59	50.4
	Strongly Agree	39	33.3
Family problems or worries caused by CAD	Strongly Disagree	7	6
	Disagree	8	6.8
	Neither Agree Nor Disagree	7	6
	Agree	62	53
	Strongly Agree	33	28.2
My emotional state, e.g., feeling down, lonely, anxious, empty	Strongly Disagree	16	13.7
	Disagree	36	30.8
	Neither Agree Nor Disagree	8	6.8
	Agree	34	29.1
	Strongly Agree	23	19.7
Aging	Strongly Disagree	8	6.8
	Disagree	33	28.2
	Neither Agree Nor Disagree	6	5.1
	Agree	48	41
	Strongly Agree	22	18.8
Alcohol	Strongly Disagree	4	3.4
	Disagree	23	19.7
	Neither Agree Nor Disagree	21	17.9
	Agree	54	46.2
	Strongly Agree	15	12.8
Smoking	Strongly Disagree	7	6
	Disagree	14	12
	Neither Agree Nor Disagree	11	9.4
	Agree	57	48.7
	Strongly Agree	28	23.9
Accident or Injury	Strongly Disagree	32	27.4
	Disagree	62	53
	Neither Agree Nor Disagree	5	4.3
	Agree	16	13.7
	Strongly Agree	2	1.7
My personality	Strongly Disagree	8	6.8
	Disagree	10	8.5
	Neither Agree Nor Disagree	7	6
	Agree	53	45.3
	Strongly Agree	39	33.3

Variables	Items	Freq.	(%)
Altered immunity	Strongly Disagree	15	12.8
	Disagree	42	35.9
	Neither Agree Nor Disagree	10	8.5
	Agree	35	29.9
	Strongly Agree	15	12.8

DISCUSSION

The study showed that most patients with CAD had a negative perception of their illness, including a perceived lack of control over the disease and a belief that it was a chronic and progressive condition. The patients also reported experiencing various physical symptoms, including chest pain and fatigue, which they believed were caused by the disease.

The findings of this study highlight the importance of addressing the illness perception of patients with CAD, as it can significantly impact their quality of life. By understanding their perceptions, healthcare providers, particularly nurses, can develop targeted interventions to address these patients' specific concerns and worries and ultimately improve their overall experience with the disease.

Nurses can also play a crucial role in educating patients about their illnesses and helping them to develop a more positive perception of their condition. This can include providing information about the causes and consequences of the disease, discussing available treatments and lifestyle modifications, and addressing any misconceptions about the disease. By doing so, nurses can help patients to feel more in control of their condition, reduce their anxiety and worry, and improve their overall quality of life (17, 18).

This highlights the importance of addressing the illness perception in patients with CAD, as it can significantly impact their quality of life. In addition, effective communication and education about the disease, treatment options, and the expected course of therapy can help improve patients' understanding and reduce their negative beliefs. Healthcare providers can improve patients' clinical outcomes and enhance their overall well-being by doing so. In conclusion, this study suggests that nurses and other healthcare providers should assess patients' illness perceptions and address any misunderstandings or negative beliefs they may have.

The findings of this study indicate that individuals with CAD have mixed perceptions of their illness, a chronic and severe condition. In addition, the show that the patients According to the findings, nearly half the patients believe that their symptoms or complications are related to their CAD, while the other half consider their symptoms unrelated to the illness, indicating that the patients are unsure about the nature of their illness and the accompanying symptoms. The results are consistent with previous research by Goodman et al., who found similar associations between illness perception, self-care behavior, and quality of life in patients diagnosed with heart failure (19).

From the mean scores of each domain, the higher the mean score of a dimension, the more it is perceived to affect the individual's traumatic event experience. These results show that emotional representativeness is the most impactful dimension, followed by the event's consequences and personal control. In contrast, the cyclical nature of the event appears to have the least impact.

It is also important to note that higher scores on the consequences, timeline, and illness coherence dimensions reflect more negative beliefs, whereas a higher score on the personal control/cure dimension reflects more positive beliefs. This highlights the importance of examining different dimensions of an individual's experience with a traumatic event, as the overall experience is complex and multifaceted (20).

Comparing the different dimensions, we can see that the scores for emotional representativeness have a wider range than the other dimensions, with a minimum score of 11 and a maximum score of 56. This suggests a greater

variation in how individuals perceive the emotional aspect of their experience compared to the other dimensions. Similarly, the standard deviation for emotional representativeness is larger, indicating a wider spread of scores around the mean (21, 22).

The high scores in the identity, timeline, consequences, and cyclical dimensions of the questionnaire suggest that the patients have strong beliefs about the serious consequences of their illness, that it is a chronic or long-term condition, that its symptoms are cyclical, and that they can control the symptoms and that the treatment is effective in controlling the illness. These findings highlight the importance of educating patients about their illness, the course of therapy, and the nature of the disease to improve their quality of life and clinical outcomes.

The study by Sacharloo (2007) focuses on the perceptions and quality of life of patients with a different chronic condition (chronic obstructive pulmonary disease) compared to the study you previously provided information about, which focuses on patients with coronary artery disease (23). However, both studies share the concept of investigating the impact of illness perceptions on the quality of life of patients with chronic conditions. By measuring patients' beliefs and attitudes towards their illnesses, researchers aim to understand the factors contributing to their quality of life and identify potential improvement areas. The study of chronic obstructive pulmonary disease patients used the Illness Perception Questionnaire (IPQ) to assess patients' perceptions of their illness. Similarly, the study of coronary artery disease patients also used the IPQ-R to evaluate patients' beliefs and attitudes toward their illnesses. Both studies found that higher scores in the consequences, timeline, and identity dimensions of the IPQ reflected negative beliefs and attitudes towards the illness, while higher scores in the control/cure dimension reflected more positive beliefs. Therefore, these studies highlight the importance of understanding patients' illness perceptions to improve their quality of life. By addressing negative beliefs and attitudes and improving patients' understanding of their illness, healthcare providers can help patients manage their condition more effectively and enhance their overall quality of life.

Most patients in the current study tend to believe that the disease is chronic and not just an acute incident. This is in line with the disease nature, where the patient needs to understand the chronicity of their illness to behave and alter their lifestyle to cope with the nature of the disease. Also, the patients believe in the cyclical nature of the disease.

High scores on the personal control, treatment control, and coherence dimensions represent positive beliefs about the controllability of the illness and a personal understanding of the condition. However, the patients believed that many of the causes of their illness were under their control because of the high scores shown in personal control and treatment control.

On the other hand, having high scores on the illness coherence scale show a greater extent of patients' belief that they have a coherent or clear model of the illness. Although the patients showed low scores in illness coherence in the current study, this suggests that they comprehend that their illness has no clear and incoherent model. Coronary artery disease has clear causes, risk factors, diagnostic measures, pharmacological and non-pharmacological interventions, and therapeutic guidelines (24-26). The findings of the patients not believing in the coherence of their illness and having such perceptions suggest that they did not receive proper education about their illness.

Moreover, the higher scores on the scale of emotional representation, the more patients' negative emotional responses to illness. Emotional representation combines negative reactions such as fear, anger, and distress and asks patients to rate statements such as "I get depressed when I think about my illness" and "My illness makes me feel afraid." Although the vast majority of the patients in the current study showed very low scores in emotional representation, this means that, to a certain extent, the illness is not negatively influencing their emotions.

More-educated patients may have a better understanding of their disease. In the case of CAD, the current study revealed that education was the only factor correlated with the perception of having severe consequences of their disease. In general, it is well known that

socioeconomic status influences the occurrence of disease and death, but much less information is available regarding the relationship between socioeconomic class and QOL after CAD treatment

The present study inferences the need to design a behavioral intervention that targets patients' illness perceptions and illness-related beliefs to help patients attain a more coherent understanding. These interventions must include detailed information about the disease symptoms, treatment, and course while addressing patients' emotional reactions.

Additionally, healthcare providers can use interactive techniques, such as patient education, to help improve illness perception. This may involve providing patients with clear and accurate information about their condition, explaining the causes and effects of their symptoms, and discussing the available treatment options. Providing patients with a sense of control and understanding of their illness can help reduce uncertainty and improve their overall well-being.

Moreover, healthcare providers can also use various methods to reassure patients and address their concerns, such as active listening, empathy, and open communication. A supportive and non-judgmental environment can help build trust and improve the patient-provider relationship. This, in turn, can help to improve the patient's experience and perception of their illness.

Healthcare providers must take a patient-centered approach when working with patients with chronic conditions. This means considering the individual's unique needs, experiences, and preferences and tailoring the care to meet those needs. By working with patients to develop a comprehensive and individualized care plan, healthcare providers can help improve patients' perceptions of their illness and overall quality of life. (27) Hence, a future prospective study is needed to evaluate the role and the effectiveness of different psychological interventions on the illness perception and quality of life of patients with CAD.

Limitations of the study

it is important to note that the findings of this study are based on self-reported perceptions of illness and may not accurately reflect the objective reality of participants' conditions. Participants may have different perceptions of their illness based on their personal experiences, beliefs, and attitudes, which may impact their responses to the IPQ-R.

Moreover, the study relied on cross-sectional data, which does not allow examining changes in illness perception over time. Longitudinal studies, which follow participants over time, would provide a more comprehensive understanding of the dynamics of illness perception.

Finally, it is also important to consider the potential influence of other factors, such as co-existing conditions, medication use, and social support, on illness perception. These factors may interact with and influence the study's results and should be considered when interpreting the findings.

Despite these limitations, this study provides important insights into how individuals perceive their illness, highlighting the need for further research. By continuing to build on this work, it will be possible to better understand the complex nature of illness perception and develop more effective interventions to improve the quality of life for people with chronic conditions.

CONCLUSION

Concentrating on changing perceptions of patients might play a role in treating coronary artery disease symptoms.

In general, the patients were confused about the nature of their disease. Hence, as regarded as the most trusted healthcare provider, nurses can significantly influence patients' illness perception by providing better education interventions. This will improve quality of life, minimize hospitalization, and enhance medication adherence. More prospective studies are mandated in the future to design superior interventional models that can be used to develop patients' perceptions.

Ethics approval and consent to participate

The study was approved by the Institution review board (IRB) of CVSKL. Issues of voluntary participation, confidentiality, anonymity, consent, and data security were considered and addressed with the participating patient

during the survey questionnaire-giving meetings. In addition, an explanation was given to all participants before the study, and consent forms were supplied together with a return of a completed questionnaire.

Competing interest

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