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RESEARCH ARTICLE

Relationship between Illness Perception and Perceived Social Support and Satisfaction with Nursing Care Quality among Patients with Coronary Heart Disease in Jordan

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Abstract:

Background:

Research has shown that illness perception, perceived social support, and patient satisfaction play a crucial role in the etiology and progression of disease and general health outcome but no previous study correlated the illness perception and perceived social support to patient satisfaction of nursing care. The purpose of this study is to determine the relationship between illness perception and perceived social support, patient satisfaction with quality of nursing care among coronary heart disease patients in Jordan.

Methods:

A descriptive, cross-sectional, and correlational design was used. A convenience sample of 275 patients with coronary heart disease was recruited from inpatient cardiac units in a university-affiliated hospital in Northern Jordan.

Results:

The overall means of illness perception and perceived social support were at a moderate level (44.04 (*SD* = 11.52), and 56.91 (*SD* = 19.91), respectively). The study revealed good to very good patient satisfaction with nursing care (3.44/5 (*SD* =.74)). Patient satisfaction was negatively correlated with illness perception and positively correlated with perceived social support. Illness perception was negatively correlated with perceived social support. Furthermore, the results from multiple linear regression analyses revealed that personal and health-related characteristics, illness perception, and perceived social support account for 64% of the variance in Patient Satisfaction with Nursing Care Quality (p-value < .05).

Conclusion:

The present study suggested that perceived social support is a significant predictor of patient satisfaction with nursing care. To improve patient outcomes, nurses should continuously assess the level of illness perception, social support, and satisfaction with nursing care quality for patients with coronary heart disease and offer an intervention based on these perceptions.

Keywords: Illness perception, Perceived social support, Patient satisfaction with the quality of nursing care, Coronary heart disease, CHD.

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1. INTRODUCTION

Coronary heart disease (CHD) is a global health concern and a major cause of mortality [1]. World Health Organization (WHO) statistics report that cardiovascular diseases affect 17.9 million people worldwide including approximately 15.2 million individuals who died due to heart attack and stroke in 2019 [2]. It is projected that by 2030, 23.6 million people worldwide will suffer from CHD. The Institute for Health Metrics and Evaluation, cites CHD as a leading cause of death in Jordan which accounts for 54.7% of the annual deaths [3].

There is evidence to suggest that psychosocial factors play a significant role in the etiology of CHD [4]. The psychological factors of depression [5], anxiety, stress, illness perception, and social support relate to the outcomes of patients with CHD [6]. Also, patient satisfaction with healthcare, and patients' perceptions of the treatment received by healthcare providers contribute to illness perceptions [7] and decrease complications

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and enhance recovery progress levels [8].

A patient diagnosed with life-disease forms an overall impression of the disease and its treatment, known as illness perception (IP) [9]. Illness perception is defined as the "patients' cognitive appraisal and personal understanding of a medical condition and its potential consequences" [10]. It has been proven that patients' perceptions of various illnesses can influence key health outcomes, knowledge that may be useful in restructuring healthcare systems to optimize patient care [7]. Low IP in patients with CHD can lead to poor medication adherence and decreased physical activity [11]. Negative illness perception can lead to high emotional distress, and a low psychological and physical quality of life [12].

Perceived social support (PSS) is one factor that influences the individual's cognitive perception of a stressful situation [13]. PSS is divided into four categories: emotional/ informational, tangible, positive social interactions, and affectionate support [14]. Individuals who perceive a lack of social support or resources can feel less in control of a stressful situation, leading to emotional instability and overall poor outcomes [15]. Also, deficient social interactions and support are related to a 29% higher risk of CHD [16].

As the ultimate beneficiaries of healthcare services, patients are considered the most important assessors of healthcare quality [17]. Nursing care has a substantial impact on patient satisfaction [7]. Patient satisfaction with nursing care quality (PSNCQ) is defined as "the subjective assessment of the cognitive-emotional reaction that results from the interaction between the expectations of nursing care and the perception of actual nurse behaviors/characteristics" [18]. Patient satisfaction surveys conducted in healthcare settings reap feedback, influencing improved quality of service. However, few studies have examined the satisfaction of CHD patients with the hospital care they receive [19]. Previous studies suggested areas of potential improvement based on PSNCQ [20]. The low satisfaction with nursing care among CHD patients leads to low-quality service, high patient anxiety, increased complications, poor participation in awareness programs, and increased patient dependence on nursing for performing daily activities [21].

Some existing literature suggests that PSS is a significant predictor of IP among patients with CHD [13, 22]. Also, previous evidence states that the negative IP and low PSS seriously impact patients with CHD, and urges further research into the relationship between CHD, IP, and PSS [23]. The literature review conducted by Mohamed *et al*. (2018) suggests that decreasing patient satisfaction levels cause CHD patients to suffer a deterioration of psychological status and increased anxiety [24]. In contrast, good social support and high-quality nursing care serve to decrease complications by assisting patients in understanding their physical capabilities and recovery progress levels [8]. Yeşilyaprak *et al.* [25] assessed the levels of satisfaction with nursing care and perceived social support among patients with chronic illness and, although levels of both were high, found a non-statistical relationship between the two factors.

The authors found that Jordanian studies in this field were centered on healthcare provider perceptions and focused on the correlation between IP and treatment adherence or quality of life among CHD patients [26]. Although a few studies have addressed the correlation between IP and PSS, we found no previous study that correlated them to PSNCQ among patients with CHD. This study aims to improve knowledge and practice about IP, PSS, and patient satisfaction by determining the negative beliefs and areas of low satisfaction with social support and nursing behavior. The objectives are to fill the knowledge gap in the literature and highlight areas requiring improvement by examining the relationship between IP, PSS, and PSNCQ among CHD patients in Jordan. Specifically, the research questions of this study were as follows:

(1) What is the level of illness perception and perceived social support and patient satisfaction with quality nursing care among CHD patients in Jordan?

(2) Is there a relationship between illness perception and perceived social support and patient satisfaction with the quality of nursing care among CHD patients in Jordan?

(3) Does patient satisfaction with nursing care quality predict illness perception and perceived social support and certain socio-demographic characteristics among CHD patients?

2. METHODS

2.1. Design and Sample

A descriptive, cross-sectional, and correlational design was used to conduct a one-time assessment of illness perception, perceived social support, patient satisfaction with nursing care quality and self-reported health history on a convenience sample of CHD patients admitted to a cardiac unit in a Jordanian hospital. Medical records were reviewed to identify patients who met the inclusion criteria, which were (a) all inpatients diagnosed with CHD for at least 6 months prior to data collection, (b) regardless of whether patients required cardiac catheterization or not, (c) they agreed to participate with full mental and physical ability (literate), and (d) $\geq$ 18 years old. Patients requiring a mechanical ventilator, continuous sedation, or showing symptoms of cognitive impairment, were excluded from the study.

Using G* Power software, the power is 0.8, the significant coefficient (alpha) is 0.05, and a small-to-medium effect size (0.10) was used to calculate the sample size. Although the study called for a minimum of 235 participants, 275 patients were approached to compensate for the expected attrition and incomplete questionnaires.

2.2. Measures

Permission to use the Arabic language questionnaires was obtained from all authors. Data was collected using a questionnaire consisting of four sections, as follows:

2.2.1. Section A

Socio-demographic data and health characteristics, comprising 19 items: age, gender, marital status, educational level, income, religion, employment status, health insurance,

smoking, presence of chronic illnesses, cardiac unit, previous cardiac catheterization procedures, psychological health status, number of years since CHD diagnosis, number of times hospitalized in the past 2 years, number of hospital room occupants (room class), duration of hospital stay (in days), if patient had a companion (yes / no question), who is the companion.

2.2.2. Section B

The 9-item Brief Illness Perception Questionnaire (Brief-IPQ), developed by Broadbent *et al*. [27], with Cronbach's alpha ranging from 0.73-0.82, was used to assess patients' IP. This tool was translated to Arabic by Saarti *et al.* [28] with Cronbach's alpha was 0.717, which indicated acceptable internal consistency. All items are graded on a 0-to-10 scale, with higher scores indicating a threatening view of the illness (severe consequences on their life). The first 5 items examine cognitive illness representations: consequences, timeline, personal control, treatment control, and identity. The next 3 items examine emotional representations: concern; emotions; and comprehensibility. The ninth item, an open-ended question, enables patients to indicate the three most important causal factors in their disease. To compute the score, score items 3, 4, and 7 were reversed and added to the items 1, 2, 5, 6, and 8. A higher score reflects the patients' more threatening view of the illness. The Brief IPQ scores were separated into three groups by Nur [29] for further interpretation: Scores 0–27 indicated a low degree of threatening IP; 28–55 indicated a moderate level of threatening IP; and 56–80 indicated a high level.

2.2.3. Section C

The Medical Outcome Study Social Support Survey (MOS-SSS) is a self-administered survey with five-point answer scales developed by Sherbourne and Stewart [14]. The Cronbach's alpha >0.91, and this tool was used to assess levels of PSS [14]. This tool was translated to Arabic by Dafaalla *et al.* [30] with Cronbach's alpha > 0.788 which indicated acceptable internal consistency of overall scale. According to empirical analysis, there are four functional subscales with 19 items with a score of 1 to 5 for each: emotional or informational support (8 items), tangible support (4 items), affectionate (3 items) and positive social interaction (3 items). The final item (item number 19) asked about "someone to do things with to help you get your mind off things". Scales were then transformed to 100% according to the original author's recommendation (lowest possible score = 0, highest possible score = 100). Wang *et al.* [31] separated the MOS-SSS total and subscale scores into three levels of perceived social support (low ≤ 35.6, moderate 35.7-87.7, high ≥ 87.8) for clear result interpretation, which are used in this study.

2.2.4. Section D

The Patient Satisfaction with Nursing Care Quality Questionnaire-Arabic (PSNCQQ-Ar) is a 21-item self-reported questionnaire developed and modified by Albashayreh *et al*. [32] from the original PSNCQQ [18]. It uses patient perceptions to operationalize PSNC quality during the hospital stay. The tool comprises two components: satisfaction with the care delivered and satisfaction with the information provided. These combine to form the total mean score of PSNCQQ and the scale has additional items related to overall quality of nursing care, service, and general health perception and hospital recommendation for others which are used as predictors. The reported Cronbach's alpha reliability estimate was 0.97 [18]. The PSNCQQ-Ar is a 5-point Likert scale (1 = poor, 5 = excellent). Scores of < 1.95 indicate poor satisfaction, 2 - 2.7 fair satisfaction, 2.75 - 3.42 good satisfaction, 3.5 - 4.2 very good satisfaction, and 4.25 - 5 excellent satisfaction [32]. Each domain's item scores can be added together and averaged to get a single value for each patient. A composite score (*i.e*., overall PSNC quality) or a domain-based score can be reported for PSNC quality [32]. The Cronbach's alpha coefficient for the PSNCQQ-Ar was high (0.96) and similar across different hospital units, just as the original PSNCQQ [32].

2.3. Data Collection

Approval was requested from the Institutional Review Boards (IRB) of Jordan University of Science and Technology (JUST) and King Abdallah University Hospital (KAUH). Subsequently, permission was sought from the head nurses of the inpatient cardiac unit to review the relevant medical records and to collect data. Upon receiving clearance, the researcher visited the patients' rooms to see who was available and agreeable to participating in our study. Participants had to be literate. After completing the questionnaire by hand, which took 5-10 minutes, the participants submitted it to the nursing staff for delivery to the researcher. The researcher approached patients during different days and shifts (8 a.m. to 10 p.m.) between January 22, 2022 and March 17, 2022 to distribute the questionnaire.

2.4. Ethical Considerations

The IRB at JUST and KAUH reviewed and approved the study proposal (536-2021) upon the provision of comprehensive information on the study's objectives, data collection technique, the time required to complete the questionnaires, and the possible disadvantages and benefits of participation. All participants were given a pack that contained the questionnaire and a cover letter describing the benefits and purpose of the study, along with assurance of full privacy and confidentiality. Each participant was identified by a number (from 1 to 275) and each questionnaire was in an envelope. Participation was voluntary and participants were guaranteed anonymity and the right to refuse or withdraw at any time without explanation or consequences. Written consent was obtained from the participants, and the participant's act of completing the questionnaire was consent. The researcher stored all completed questionnaires in a locked drawer at home. The researcher was available at the time of data collection and throughout the study to answer questions.

2.5. Statistical Analysis

The means and standard deviations were used to describe the continuously measured variables and the frequencies and percentages for the categorically measured variables. The Bivariate Pearson's correlations test (r) was applied to assess the correlations between the patients' measured perceptions

and the multivariate linear regression analysis was applied to assess the statistical significance of the predictors of PSNCQ in the sample. The association between these predictors with the dependent outcome variables was expressed as a beta coefficient (B) with its associated 95% confidence interval. Before data analysis, statistical advice was obtained to ensure that all multiple linear regression test requirements were met. The alpha statistical significance was considered at 0.050. The commercially available SPSS IBM statistical data analysis program Version 26 (IBM, 2103) was used for statistical data analysis.

3. RESULTS

3.1. Description of the Demographic Characteristics

A total of 275 patients residing in Jordan and diagnosed with CHD returned completed questionnaires from the cardiac units (100% response rate). The socio-demographic characteristics of the participants, as presented in Table **1**, indicated an average age of 53.81 ± 10.52 years, and most of them falling into the age range of 51 to 60 years (n=93) with males highly predominating at 73.5%, n=202. Most participants were married (71.3%, n=196), Muslims (90.2%, n=248), employed (48.7%, n=134), and half of them held a university degree (50.6%, n=142). This implies that most participants are intelligent working adults who are able to understand and follow health instructions and CHD regimens. More than half of the participants were smokers (54.9%, n=151). Furthermore, most participants held medical health insurance (79.6%, n=219). Also, the mean and standard deviation of income was 420.96 JOD (± 211.7), and the income ranges for most participants revealed that (42.9%, n=118) had an income between 301 and 500 JD.

Table 1. Descriptive analysis of the CHD patients' socio-demographic characteristics. N=275.

-	Frequency	Percentage
Sex	-	-
Female	73	26.5
Male	202	73.5
Age (years), mean (SD)	-	53.81 (10.52)
Age group	-	-
<=39 years	34	12.4
40—50 years	69	25.1
51—60 years	93	33.8
>=61 years	79	28.7
Marital state	-	-
Married	196	71.3
Single	26	9.5
Divorced	19	6.9
Widow	34	12.4
Religion	-	-
Muslim	248	90.2
Christian	27	9.8
Educational Level	-	-
Primary school	30	10.9
High school	51	18.5
Diploma degree	52	18.9
University degree	112	40.7
Postgraduate	30	10.9
Employment status	-	-
Employed	134	48.7
Retired	74	26.9
Unemployed	67	24.4
Income (JD), mean (SD)		420.96 (211.71)
Income range	-	-
<=300 JOD	71	25.8
301—500 JOD	118	42.9
500—750 JOD	76	27.6
>750 JOD	10	3.6
Smoking status	-	-
Smoker	151	54.9

(Table 1) contd.....

-	Frequency	Percentage
Non-smoker	92	33.5
Ex-smoker	32	11.6
Health insurance	-	-
No	56	20.4
Yes	219	79.6

3.2. Health Related Characteristics

Table **2** presents the descriptive analysis of the participant's health-related characteristics. Most of the participants had comorbidities (66.5%, n=183), and almost half had previous cardiac catheterization (49.1%, n=135), with a mean and standard deviation number of transcutaneous cardiac catheterizations in the past equal to 0.9±1.1. The participants were asked to self-rate their psychological well-being on a Likert-like scale, graded from 1 (poor) to 4 (very good). The result presented that the mean psychological well-being for the patients was measured at 2.74/4 points, midway between fair and good. Also, the result presented that most of the participants had either good or very good psychological well-being (61.5%, n=169).

Table 2. Descriptive analysis of the CHD patients' health related characteristic.

-	Frequency	Percentage %
Comorbidity	-	-
No	92	33.5
Yes	183	66.5
Previous cardiac catheterization procedures	-	-
No	140	50.9
Yes	135	49.1
Number of previous catheterizations, mean (SD)	-	0.9 (1.1)
Number of previous catheterizations	-	-
Never	140	50.9
Once	67	24.4
Two times	47	17.1
Three times or more	21	7.6
Psychological health/mental health self-rating, mean (SD)	-	2.74(0.8)
Poor	23	8.4
Fair	83	30.2
Good	111	40.4
Very Good	58	21.1
Coronary Artery Disease duration	-	-
< 1 year	124	45.1
1—5 years	82	29.8
6—10 years	43	15.6
>10 years	26	9.5
Admission Cardiac Unit	-	-
Coronary cardiac Unit (CCU)	93	33.8
Intermediate coronary care Unit (IMCU)	182	66.2
How often have you visited a hospital in the previous two years?	-	-
1 time	155	56.4
2—3 times	101	36.7
>=4 times	19	6.9
How long have you been in the hospital, median (IQR)	-	2 (2)
For most of your hospital stay, were you in a room?	-	-
By yourself	148	53.8
with more than 1 other person	34	12.4
with more than 2 other persons	93	33.8
Do you have a family member accompanying you	-	-
No	134	48.7
Yes	141	51.3

(Table 2) contd.....

-	Frequency	Percentage %
Who is the companion	-	-
Husband	2	0.7
Wife	40	14.5
Sister	9	3.3
Brother	28	10.2
Son	51	18.5
Daughter	16	5.8
No companion	129	46.9

Table 3. Descriptive analysis of participants' overall perceptions.

-	Mean	SD	Score possible range
Overall IP total score	44.04	11.52	0—80 points
1. Cognitive representation mean subscale	6.28	1.2	0—10 points
2. Emotional representation mean subscale	6.68	1.67	0—10 points
Overall PSS total score	56.91	19.91	0—100 points
1. Emotional/informational support	58.24	18.15	0—100 points
2. Tangible support	59.44	26.8	0—100 points
3. Affectionate support	49.8	31.1	0—100 points
4. Positive social Interaction support	47.63	29.9	0—100 points
Overall PSNCQ score	3.44	.74	1—5 points
1. Satisfaction with provided information subscale	3.32	.77	1—5 points
2. Satisfaction with provided care subscale	3.50	.84	1—5 points
3. General perception of quality of care	-	-	-
a. Overall quality of care and services	3.6	.89	1—5 points
b. Overall quality of nursing care	3.1	.88	1—5 points
c. Health status	3.6	.86	1—5 points
d. Recommendation of hospital to others	3.7	.93	1—5 points

Table **2** also presented that most of the participants had had CHD for less than one year (45.1%, n=124), and most of them had been admitted to the Intermediate Coronary Care Units (ICCUs) (66.2%, n=182). Also, more than half of the participants had been hospitalized at least once in the last two years (56.4%, n=155). Furthermore, the participants recorded hospital stays equal to a median of 2 days with an inter-quartile range (IQR) of 2 days on average. The result also presented that more than half were hospitalized as single patients in one room (53.8%, n=148), and were permitted to have a family member (companion) in the hospital (51.3%, n=141). Lastly, the relationships of those companions with the patients are shown in Table **2**.

3.3. Participants' Overall Perceptions

Table **3** shows the results of the descriptive analysis of the mean and standard deviation for the overall perceptions of patients with CHD and reveals that the patients' overall IP was measured with a collective mean and standard deviation 44.04±11.52, indicating a moderate level of threatening or negative IP. Nevertheless, the patients' overall mean cognitive representation subscale score was measured with a collective mean of 6.28/10 points, and their emotional representation mean was measured at 6.68/10 points.

The findings also showed that the patients' overall PSS (MOS-SSS) score was measured at 56.91/100 points, indicative of moderate PSS in general. The patients' overall rating of their perception of the emotional/informational support subscale stands at 58.24/100 points, and their perceived tangible support was rated at 59.44/100 points. However, the affectionate and social interactive support subscales scored a collective mean of 49.8/100 and 47.63/100 points on average, respectively. All these subscales are at a moderate level, but the social support and tangible and emotional support were more favorable than the social interactive and affection support aspects.

The patients' overall satisfaction with nursing care quality was measured at 3.44/5 points, denoting between good and very good satisfaction. The patients' satisfaction with the information provided by the nurses scored a mean of 3.32/54 points, suggesting good satisfaction. Their satisfaction with the care given by nurses was good, rated with a mean score equal to 3.50/5 points on average.

The patients' overall perceived satisfaction with the quality of services they had received was rated at 3.6/5 points, suggesting very good satisfaction. Their general satisfaction with the nursing care was rated at 3.1/5 points, indicating good satisfaction. The patients' general health self-rating was measured at 3.6/5 points, indicating a very good level of perceived satisfaction. The patients showed a very good intention to recommend the hospital to others, with this point rated at 3.7/5 points.

Table 4. Pearson's (r) Bivariate Correlations between the patients' measured perceptions.

-	PSNCQ	PSS	IP	-				
IP*	r	-.190**	-.159**	1	-	-	-	-
PSS*	r	.337**	-	-	-	-	-	-
PSNCQ*	r	1	-	-	-	-	-	-

Note: ** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
Illness perception (IP*), perceived social support (PSS*), Patient Satisfaction with Nursing Care Quality (PSNCQ*).

Table 5. Multivariate linear regression analysis of the patients' satisfaction with the quality of nursing care (PSNCQ).

-	Unstandardized Beta Coefficients	95.0% CI for Beta		*p-value
		Lower Bound	Upper Bound	
Educational Level= Primary	.267	.099	.435	**.002***
Hospitalized with >1 persons in the room	-.109	-.166	-.053	**<0.001***
Overall quality of services received	.242	.161	.323	**<0.001***
Overall quality of nursing care you received during the hospital stay	.135	.062	.208	**<0.001***
General Health self-rating	.225	.140	.309	**<0.001***
Perceived social support	.004	.001	.006	**.011***

3.4. Relationship between IP, PSS and PSNCQ

Table **4** shows the results of Pearson r analyses which reveal that PSNCQ was significantly but negatively weakly correlated with their mean perceived IP score, suggesting that as the patients' perceived illness increased, their satisfaction with nursing care quality decreased. PSNCQ was correlated significantly, moderately, and positively with PSS, indicating that greater social support was related to higher satisfaction with nursing care quality in general. The patients' IP was significantly but negatively correlated with their mean PSS score.

3.5. Predictors of PSNCQ

The statistically significant predictors of PSNCQ identified in this study include educational level (primary), sharing a room with >1 person, overall quality of services received, overall quality of nursing care during the hospital stay, general health self-rating, and PSS. According to the model, the result indicated a significant regression, $F(11.259) = 45.35$, $p < .001$, $R^2 = .658$, adjusted $R^2 = 0.644$, $p < .05$, which indicates that 64% of the variance in the PSNCQQ was explained by all the predictors (Table **5**).

4. DISCUSSION

This study aimed to assess levels of IP, PSS, and PSNCQ among CHD patients and to examine the relationships between these factors while identifying those variables that predicted PSNCQ in the sample. The present study revealed a moderate level of negative IP and PSS, along with good to very good satisfaction with PSNC. PSS and primary education level, being hospitalized with multiple room occupants, overall quality of services received, overall quality of nursing care received during the hospital stay, and general health status were discovered to be predictors of PSNCQ.

4.1. Levels of Illness Perception, Perceived Social Support, and Patient Satisfaction with the Quality of Nursing Care

Our study participants indicated a moderate level of threatening or negative IP, which supported the findings of previous studies on CHD [33, 34]. These results may be attributed to counseling received by patients from health personnel on preventive lifestyle changes which gave them a better perception of their illness. On the other hand, the high level of emotional representation response was possibly due to poor stress, anxiety, and depression management counseling, and lower health-related quality of life for CHD patients, reasons confirmed by Sararoudi *et al.* and Lerdal *et al.* [34, 35].

Our participants indicated a moderate level of PSS which suggests that they can use the available support at hand to manage stress. As a result, this will reduce levels of depression and psychological discomfort. The findings, in this context, are consistent with earlier Jordanian research showing that social support is a significant predictor of better outcomes for patients with CHD [36, 37]. In contrast, a Turkish study by Karataş and Bostanoğlu [38] found low levels of PSS among patients with CHD, stating that patients' scores for PSS from family members were high, relative to those from other sources (network support). In Canada, Wang *et al.* [32] found a high level of PSS, which differed from our result. The contradictory results may justify that the high PSS in high-income countries like Canada, where friends are associated with leisure and family activities may lead to unintended responsibilities and potential conflicts which result in strong social bonds [39] and differences in patient populations or instruments should also be taken into consideration [38].

Our participants indicated good to a very good level of satisfaction with overall nursing quality care, including the information and care provided by nurses, a result supported by Mosleh *et al.* [40] who revealed good satisfaction of critically ill patients and their families/friends with their care and decision-making in Jordan. Patients' satisfaction, hospital-

ization, and healing are all significantly influenced by effective and continuous engagement and communication [25]. In contrast to our result, Kwame & Petrucka, 2020 found a poor level of patient satisfaction with nursing car and the primary reason for dissatisfaction was the quality and quantity of information nurses provided about patients' conditions [41]. The ability of health professionals to communicate effectively is essential for making sure that patients feel respected and cared for [17]. To ensure that patients are less stressed, more involved, and well-adjusted, enough time must be provided for talking to them, listening to what they have to say, and sharing knowledge [42]. Ultimately, patient satisfaction will be increased.

5. THE RELATIONSHIP BETWEEN ILLNESS PERCEPTION (IP) AND PERCEIVED SOCIAL SUPPORT (PSS) AND PATIENT SATISFACTION WITH THE QUALITY OF NURSING CARE (PSNCQ)

The findings of the current study revealed PSNCQ to be significantly but negatively correlated with their mean perceived IP. A correlational study among chronic disease patients in the USA showed that cognitive appraisal did not predict the patients' psychosocial adjustment during the treatment process [43]. examined the impact of patients' IP on their level of satisfaction and discovered that neither the severity of their symptoms nor their emotional concerns was related to their level of dissatisfaction [44]. Thomas *et al.* found general disagreement between patients and nurses on the quality of care provided but stated that prolonged engagement with nurses favorably impacts patients' opinion of nursing care [45]. Haddad *et al*. investigated the relationship between IP and treatment satisfaction among Lebanese patients with high lipid profiles and discovered that patients with positive IP were more satisfied with their treatment than those with negative IP [46]. Conflicting results of these studies may be attributed to how patients perceived the nursing care. In other words, the positive perception of nursing care quality will be enhanced when it contains individualized care, patient feeling accepted by nurses, prompt response to patient needs, good awareness of conditions, a good nurse-patient relationship, and increased self-esteem [47].

The current study's findings showed a significant and positive correlation between patients' PSS and their mean PSNCQ. However, there are few studies addressing these variables among CHD patients. Yeşilyaprak *et al.* [25] studied the level and relationship of satisfaction with nursing care and social support among organ transplant patients and found that patients' satisfaction levels were high in terms of PSS and given nursing care. Nurses are an important source of social support and are in a position to offer patients emotional support in the form of empathetic care, and informational support by imparting information at the time of physical and mental stress [8].

The current study found that IP was significantly, but negatively correlated with their mean PSS score. In Turkey, Aydın Sayılan and Demir Doğan studied the relationship between PSS, IP, and quality of life, as well as the factors influencing these in cancer patients [48]. They reported that having a low illness perception improved people's physical, social, and psychological well-being, made them less susceptible to anxiety and depression, and improved their quality of life [48]. Shiri *et al.* also supported our result who studied the relationship between perceived social support, locus of control, and illness perception [23].

6. PREDICTORS OF PSNCQ IN PATIENTS WITH CHD

Our findings showed that patients with a primary educational level achieved a significantly greater mean PSNCQ score. Mousavi *et al.* [49] linked lower levels of education and higher satisfaction with nursing care, possibly due to such patients' lower expectations. However, Mosleh *et al.* found no significant relation between education and patient satisfaction [41]. On the other hand, Karaca and Durna found that patients with a higher education level (graduated or undergraduate) were more satisfied with nursing care relative to those who were literate [17]. Patients with greater levels of education may experience this because they are more knowledgeable about available treatments, have higher expectations for the quality of their care, and are consequently requesting higher standards [17].

Furthermore, our findings showed that patients hospitalized with multiple patients sharing a room perceived a significantly lower mean PSNCQ. Hosseini and Bagheri compared patient satisfaction for single patient rooms *versus* shared patient rooms in hospitals and found that single occupancy is an independent variable that can raise patient satisfaction [42]. Bloomer *et al*. found that single-patient rooms offer enhanced sleep quality, preservation of patient autonomy and privacy, and increased staff and patient communication since patients in single-patient rooms interacted with medical personnel more frequently and effectively [50]. Patients' caregivers also benefited from single-patient rooms as they were able to spend more time with their patients.

The findings also showed a significant and positive correlation between patients' mean perceived willingness to recommend the hospital to others and PSNCQ. The patients' hospital experience strongly influences their intention to recommend it to friends and family [25]. Individuals seeking information about hospital performance often seek personal recommendations from their social network [51].

Our findings showed the patients' self-rated general health mean score correlated significantly and positively with PSNCQ, a result supported by Romero-García *et al.* who studied the factors associated with the level of satisfaction and found that patients who perceived a greater health status reported higher satisfaction levels [52]. Similarly, Al-Awamreh and Suliman reported the same result: patients who gave themselves an "excellent or good" health rating were satisfied with the level of nursing care quality they received [53]. This may also be attributed to patients' perceptions that receiving high-quality nursing care improved their health status [52, 53].

Our study findings illustrated that the overall mean perceived quality of hospital services was significantly and positively associated with their mean PSNCQ. This result is supported by Amarantou *et al*. who found that overall patient satisfaction acts as a mediator between perceived service

quality and patient behavioral intentions [54]. In addition, Thapa and Ghimire reported that patient satisfaction was influenced by health service quality, stating that patient satisfaction rises when they feel concern from their healthcare professional and receive individual attention [55].

The current study illustrated that the perception of the overall quality of nursing care received during the hospital stay was significantly and positively associated with PSNCQ. Thomas *et al.* also found a positive correlation and highlighted that patient perceptions of care quality are highly linked to patient expectations [56]. Nurses play a critical role in the quality of patient care since they are in direct contact with the patient and family [8, 25, 54].

In the current study, a significant positive correlation was identified between PSNCQ and PSS, with greater social support predicting significantly higher satisfaction with nursing care quality, a point which was discussed later.

7. LIMITATIONS AND STRENGTHS OF THE STUDY

This is the first study to examine the relationship between IP, PSS, and PSQNC among coronary heart disease patients in the cardiac units of a hospital in northern Jordan. Despite using a reliable and valid instrument for data collection, the study still has several limitations. First, participants were selected at a single hospital and may not be representative of patient illness perception, perceived social support, and patient satisfaction with the quality of nursing care in other hospitals. Furthermore, the participants were recruited using the convenience sampling technique, which limits the generalizability of the study findings. The data collection was conducted in the cardiac units, which may not represent the IP, PSS, and PSQNC of other hospital departments. The study sample was relatively small, thus future studies should involve larger samples from a greater number of health facilities, evaluated over longer periods of time. It is impossible to gauge causal inference due to the cross-sectional nature of the study. We must also account for some patients giving responses that aimed to please the researcher, thus affecting the accuracy of results. Lastly, we forgot to ask patients why they were admitted to hospital.

The study also has its strengths. For example, the participating hospital covers the whole of north and central Jordan, drawing patients from different regions and socio-demographic status, thus rendering the findings beneficial to nursing practice. Also, this study examined the relationship between multiple important variables related to patient care that create evidence-based applications in clinical settings and form the foundation for future experimental research. The most important point identified is that positive social support is crucial for improving patient satisfaction with the quality of nursing care.

CONCLUSION/IMPLICATIONS

The present study revealed a moderate level of negative IP and perceived PSS, as well as good to very good satisfaction with nursing care. Furthermore, social support and personal and health-related characteristics were discovered to be predictors of patient satisfaction with the quality of nursing care as discussed previously. Therefore, activating and promoting the role of nurses in checking the quality of holistic aspects of patient care, such as illness perception and social support, is crucial for improving patient outcomes and increasing patient satisfaction. We recommend the creation of specialized effective intervention programs alongside the integration of these results into the nursing process. Future studies should identify additional variables that predict PSNCQ and use all the identified variables to build appropriate treatment guidelines for CHD patients.

LIST OF ABBREVIATIONS

IP	=	Illness perception
PSS	=	Perceived social support
PSNCQ	=	Patient Satisfaction with Nursing Care Quality
PSNCQQ-Ar	=	Patient Satisfaction with Nursing Care Quality Questionnaire-Arabic
Brief-IPQ	=	Brief Illness Perception Questionnaire
CHD	=	Coronary heart disease
WHO	=	World Health Organization

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The IRB at JUST and KAUH reviewed and approved the study proposal (536-2021) upon the provision of comprehensive information on the study's objectives, data collection technique, the time required to complete the questionnaires and the possible disadvantages and benefits of participation.

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

Informed consent was obtained from all participants

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data supporting the findings of the article is available in the Zenodo Repository at https://zenodo.org/records/10143546, reference number 10143546.

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CONFLICT OF INTEREST

The authors declare no conflict of interest financial or

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