CDC Journal, Year 31, No. 45, December 2023, DOI: https://doi.org/10.3126/cdj.v31i45.68978
Received Date: December 17, 2023 Accepted Date: April 29, 2024

Stress and Coping Measures among Patients with Coronary Artery Disease in a Cardiac Hospital, Kathmandu

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Abstract

Coronary Artery Disease (CAD) is the leading cause of death worldwide. Patients diagnosed with CAD face major physical and emotional challenges. Identifying stress among CAD patients can reduce the negative effects of illness perception, decrease adherence and complications by preventing numerous morbidities. The objective of study was to assess the stress levels and coping measures among CAD patients. A descriptive cross-sectional study design was chosen. Non-probability purposive sampling method was used to collect data among 376 CAD patients from outpatient department of Manmohan Cardiothoracic vascular and Transplant Center (MCVTC). Data was collected from 7th August to 9th September 2022, through a structured interview questionnaire using standardized tools consisting of the Perceived Stress Scale and Brief Cope scale. Data analysis was done using SPSS version 16, through descriptive statistics, and inferential statistics tests. In this study, 1.1% of CAD patients had low stress, 90.7% had moderate stress, and 8.2% had severe stress. Regarding coping measures, the most used coping measures were problem-focused coping measures with a median percent (75%) and 96.3% of CAD patients adopted adaptive coping. While there was a statistically significant between stress and duration of illness (p=.009) and frequency of hospitalization (p=.049) overall coping had a positive correlation with stress (r=0.157, p=.002). This study concluded that a moderate level of stress was prevalent among majority of CAD patients. Improving coping measures can help CAD patients to minimize stress. Thus, finding suggest that health personnel need to address coping measures to overcome from stress among CAD patients.

Keywords: *Cardiac hospital, coronary artery disease (CAD), coping measures, patients, stress,*

Introduction

The leading cause of death worldwide is cardiovascular disease. Coronary Artery disease refers to a group of illnesses that affect the heart or blood arteries (Stewart et al., 2017). About 15.5 million Americans aged 20 or older have coronary artery disease (CAD) (Sanchis-Gomar et al., 2016). In Pakistan, the prevalence of stress and depression in cardiac patients was 47%. In Nepal cardiovascular disease is more common (around 49%) in the young age group ranging from 35 to 50 years old (Adhikari et al., 2014). Perceived stress is a significant problem among CAD patients (Mulle & Vaccarino, 2013).

Coping also refers to specific ways in which people respond to stressful situations (Saffari et al., 2017). Cardiovascular patients may benefit from stress management measure (Sadr Bafghi et al., 2018). Patients with CAD have shown that coping measures increased along with the level of stress (Bhagyalakshmi et al., 2012).

Evidence exists for various factors that are associated with stress in patients with CAD There was a significant association between cognitive coping measures and stress. Hence, CAD patients should be advised to address the prevention of emotional stress (Blikman et al., 2014). The importance of educating stress coping measures in CAD patients is felt more than ever.

Methods and Materials

A descriptive cross-sectional research design was chosen to assess stress and coping measures among patients with coronary artery disease. The study was conducted at Manmohan Cardiothoracic Vascular &Transplant Center (MCVTC). The sample size is calculated by using the Cochran's formula**.** The required sample size was determined based on a similar study done in India by Bhagyalakshmi et al., 2012 (p=0.43%)

A sample of 376 patients with CAD patients was collected who were visited in cardiology OPD. Data was collected at the outpatient department (OPD) of MCVTC including general and paying OPD. The researcher collected a total number of samples from CAD patients who were visited in cardiology OPD of MCVTC. A non-probability purposive sampling technique was adopted.

The study population was patients diagnosed (how did the CAD with coronary artery diseases. Inclusion criteria included patients of age above 18 years' patients diagnosed with Coronary artery disease, for more than one month. A structured interview questionnaire was used for data collection. Perceived Stress Scale (PSS) and Brief Cope Scale (BCS) tools were used. The structured interview schedule is divided into three sections. Sociodemographic variables included 10 items related to sociodemographic variables of patients such as; Age,

sex, Marital status, religion, educational status, type of family, occupation, income status, duration of illness and frequency of hospitalization. Furthermore, the (PSS) was used to assess Stress, which was developed by Cohen et al., (1983). The PSS is 10 items scale. PSS scores were obtained by reversing responses (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1 & 4 = 0) to the four positively stated items (items 4, 5, 7, & 8) and then summing across all scale items. The minimum obtained score is 0, while the maximum score is 40 points. A higher score indicated a greater perceived stress. The sum of scores for each item ranges between zero and 40, categorized as; Low stress = score ranging from 0–13, Moderate stress = score ranging from 14–26 and Severe stress = score ranging from 27–40 (Da Rosa Friedrich et al., 2019)**.** A five-point Likert scale was used and the responses were 0=never, 1= seldom, 2=sometimes,3= often,4= Almost always. Additionally, to assess Coping Measures**,** The Brief-COPE scale was used which was developed by Charles C. Carver. The Brief-COPE is a 28-item self-report questionnaire(Brief-cope et al., 1997). Scores were obtained by reversing responses (i.e. 1=4, 2=3, 3=2 & 4=1) to the seven negatively stated items (3, 4, 8, 11, 13, 16&26) and then summing across all scale items. A four-point Likert scale was used and the responses i.e. 1=not doing at all to 4=doing this a lot. There are 14 subscale containing two items i.e.; Self-distraction (items 1 & 19), Active coping (items 2 & 7), Denial (items 3 & 8), Substance use (items 4 & 11), Emotional support (items 5 & 15), Informational support (items 10 & 23), Behavioral disengagement (items 6 & 16), Venting (items 9 & 21), Positive reframing (items 12 & 17), Planning (items 14 & 25), Humor (items 13 &26) (Brief-cope et al., 1997)**.**

It contained three types of coping measures;

Problem-Focused Coping: It consisted of 7 items (Items 2, 5, 7, 10, 14, 23, and 25). **Emotion-Focused Coping**: It consisted of 9 items (Items 12, 15, 17, 18, 20, 22, 24, 27, 28).

Avoidant/dysfunctional Coping: It consisted of 12 items (Items 1, 3, 4, 6, 8, 9,11,13, 16, 19,21,26) (Azale et al., 2018).

According to Tripathi and Devkota (2020), the total score of coping was 112 and the level of coping measures was categorized as;

Adoptive coping: Score ranging from 57-112

Maladaptive coping: Score ranging from 28-56

Questionnaires were pretested in 38 need to mention CAD patients attending cardiology OPD in MCVTC. The reliability of the tool was calculated by Cronbach's alpha and score was found to be 0.82 in stress and 0.83 in brief cope scale. Hence, the tool

was found to be reliable for conducting the study. Validated standard instruments were used to assess stress and coping measures. Nepali version of Perceived Stress Scale (PSS) and Brief-COPE scale. The internal consistency of the PSS was acceptable (Cronbach's α =0.70) (Aihara et al., 2015) and Brief-COPE scale was acceptable (Cronbach's α =0.78) (Tripathi & Devkota, 2020).

Prior to data collection, ethical approval was taken from the Institutional Review Committee of the Institute of Medicine, Maharajgunj, Kathmandu. Formal permission was taken from the Manmohan Cardiothoracic Vascular and Transplant Centre. Written informed consent from each respondent was obtained before data collection. Dignity, confidentiality and privacy were maintained during the data collection. Data was collected from 7th August to 9th September 2022. The researcher herself collected the data. It was collected by face-to-face interview method with valid instruments in the Nepali language. The duration of each interview was approximately 25 minutes. All the obtained data was coded, organized and entered into IBM SPSS 16 version. The normality of data was tested using the Shapiro-Wilk test. Data analysis was done through descriptive and inferential statistics. Spearman's Correlation was used to measure the relationship between stress and coping measures. The chi-square test was used to find out the association between stress with selected variables and coping with selected sociodemographic variables of patients. Interpretation of data was done on the basis of analyzed data.

Results

Regarding the age of 376 CAD patients, 25 % of the respondents were between 51-60 years of age. The median age of the respondents is 54, minimum age: 20 years, and maximum age: 91 years. Among them more than half 53.7 % were male. Regarding marital status, almost all (91.4%) of respondents were married. Regarding religion, most (85.1%) of the respondents were Hindu. Likewise, 29.6% had a primary level of education. The majority (62%) belong to the nuclear family. Regarding occupation, more than one third 135(35.9%) were service holder. About income status, more than half (63.8%) of respondents' families had income status enough for more than one year.

About respondents' illness related characteristics, 48.2% of respondent suffering from CAD more than one year. Regarding frequency of hospitalization, 47.2% of patients were admitted once. What was the purpose of hospital admission? Due to CAD or other than CAD?

Table 1
Level of Stress of the Respondents n=376

Level of stress	Number	Percent
Low (0-13)	4	1.1
Moderate (14-26)	341	90.7
Severe (27-40)	31	8.2
Total	**376**	**100.0**

Table 1 shows that majority (90.7%) of the respondents had moderate stress, 8.2 % had severe stress and 1.1 % had low stress.

Table 2
Respondents' Scores on Different Domain of Coping Measures among Respondents

Domains Coping	No. of items	Possible score	Obtained Range	Median score	(Q1, Q3)
Problem Focused	7	7-28	10-28	**21**	18,22
Emotion Focused	9	9-36	15-34	**25**	22,27
Dysfunctional Focused	12	12-48	18-44	**34**	30,37
Total	**28**	**112**	**43-106**	**80**	**70,86**

(Median percent of problem-focused coping 75%, Emotion Focused 69.4%, Dysfunctional Focused 70.8%)

This study showed that problem-focused coping measures were more likely to be used for dealing with stress with a median percent (75%). followed by avoidance or dysfunctional-focused coping measures with a median percent (70.8 %).

Table 3
Level of Coping of Respondents n=376

Level of Coping	Number	Percent
Maladaptive (28-56)	14	3.7
Adaptive (57-112)	362	96.3
Total	**376**	**100.0**

Table 3 represents the level of coping measures in which 96.3% of the respondents had adaptive coping measures.

Table 4

Association between level of Stress and Respondents with and Selected Variables n=376

Variables	Stress level		χ^2	P-value
	Low and moderate	Severe		
Age				
<40 years	81(91.0%)	8(9.0%)	.112	.945
41-60	156(91.8%)	14(8.2%)		
>61 years	108(92.3%)	9(7.7%)		
Sex				
Male	187(92.6%)	15(7.4%)	.387	.534
Female	158(90.8%)	16(9.2%)		
Education status				
Can read &write	278(92.7%)	22(7.3%)	1.630	.202
Cannot read & write	67(88.2%)	9(11.8%)		
Types of family				
Nuclear	216(92.7%)	17(7.3%)	.729	.393
Joint and Extended	129(90.2%)	14(9.8%)		
Occupation				
Unemployed	142(94%)	9(6%)	1.741	.187
Employed	203(90.2%)	22(9.8%)		
Duration of illness				
≤ 1 year	172(88.2%)	23(11.8%)	6.749	.009
≥1 year	173(95.6%)	8(4.4%)		
Frequency of hospitalization				
No admission	90(96.8%)	3(3.2%)	4.114	.049#
Admission	255(90.1%)	28(9.9%)		

Fisher's Exact Test#

There was a statistically significant association between Stress with duration of illness (*p*=.009) and frequency of hospitalization (p=.049).

Table 5

Relationship between Stress and Coping Measures n=376

Stress Coping	Spearman's rank correlation	*P*-value
Emotion-focused	0.129*	.012*
Problem	0.216**	.000*
Avoidance/dysfunctional	0.053	.306
Total coping score	0.157**	.002*

***Correlation is significant at the 0.01 level (2-tailed)*

**Correlation is significant at the 0.05 level (2-tailed*)

Table 5 depicts spearman's rank correlation between total score of stress and different domains of coping. There was no significant relationship between avoidance/ dysfunctional focused (r= 0.053) coping measures while problem-focused coping measures (r= 0.216) and emotion-focused coping measures (r= 0.129) were significantly related to stress. Overall coping had a positive correlation with stress (r= 0.157).

Discussion

This descriptive cross-sectional research design was done to assess stress and coping measures among patients with coronary artery disease attending Manmohan Cardiothoracic Vascular and Transplant Centre, Kathmandu. In this study, the first objective was to identify the level of stress among the patients with coronary artery disease. Data suggest that patients presenting with CAD had higher levels of perceived stress. However, higher levels of adaptation of coping measures. Out of total 376 CAD patients, 4 (1.1%) had low stress, 341 (90.7%) had moderate stress and 31 (8.2%) experienced severe stress. All 372 (98.9%) were diagnosed under stress using a PSS score >14 in the study. A similar study was conducted in CCU at a tertiary care hospital in India by Bhagyalaxmi, et al (2012), According to the study, 57 patients (57%) had low levels of stress, 43 patients (43%) had moderate levels of stress, and none of the patients had high levels of stress. The difference might be due to the sample size and setting of the present study. Different setting might imply the severity of patients that might cause different coping measures.

The second objective of this study was to assess coping measures among CAD patients. Regarding coping, the most frequently used coping was problem-focused coping measures with a median percent (75%), avoidance or dysfunctional with a median percent (70.8%), and emotion-focused with a median percent (69.4%). The finding of the study is supported by the study findings of Khan et al., 2012[14] conducted in the outdoor and indoor patient departments of cardiology, of two leading hospitals of Raipur, which reported that the maximum number of coronary heart disease patients had used a higher score of problem-focused coping measures.

Further, this study showed that Stress and Avoidance/Dysfunctional (r=.053, p=.306) had no association. Stress and problem-focused coping (r=.216, p=.000) and emotion-focused coping (r=.129, p=.012) showed positive relationships, indicating that problem-focused coping and emotion-focused coping increase with increasing intensity of stress. The study's findings were corroborated by those of a study by Sadr et al., (2018), which found that 71 (60.2%) CAD patients who utilized emotion-focused coping mechanisms had significant levels of stress. In contrast, the Australian study by Di Benedetto et al. (2014) found that higher levels of coping predicted lower levels of stress (standardized coefficient =-.72, (SE=.050, p.001), indicating that coping has a more significant impact on maintaining psychological well-being.

The findings were also supported by another research study conducted in Nepal by Panthee et al., (2011) which reported that problem-focused coping measures were more often used than emotion focused coping measures. Problem-focused coping was not connected with the psychological & spiritual or family dimensions but was significantly positively associated with total QoL (r =.41, p.01), notably the health and functional and socio-economic dimensions. Compared to women, men utilized more problem-focused coping mechanisms. Men and women scored significantly differently on problem-focused coping (t = 4.9, p.05). This might be due to differences in sample size, difference in perception of stress and geographical disparity.

The third objective is to identify the association between the level of stress with selected sociodemographic variables and coping measures with selected sociodemographic variables. In this study, there was a statistically significant association between Stress with duration of illness (p=0.009) and number of hospitalizations (p=0.049) and no statistically significant association between Stress with age, sex, educational status and type of family. This finding was supported by a study conducted in India conducted by Bhagyalaxmi et al (2012), showed an insignificant association between stress with age, education, and family system. The results from this study revealed that there was no significant association between coping with age, sex, type of family, educational level, occupation, and duration of illness and Frequency of hospitalization. The findings of this study were supported by the study conducted by Rahman, (2013), which showed that there was no statistically significant difference in coping strategies according to age, educational level, and duration of illness. the possible reason might be due to a study conducted had a heterogeneous population i.e. respondents range in age from 20 years to 91 years.

Further, according to fourth objective to measure relationship between stress and coping measures among patients with coronary artery disease. This study showed that there was a positive relationship between the total score of stress and the total score of coping (r=0.157, p=0.002). There was positive relationship between total score of stress and total score of problem focused coping (r=0.216, p=0.000), and total score of stress and total score of emotion focused coping (r=0.129, p=0.012). There was no relationship between total score of stress and total score of Dysfunctional focused coping (r=0.053, p=0.306). The findings of the study were supported by study findings of a descriptive-correlational study from Iran in cardiovascular disease patients conducted by Sadr Bafghi et al., (2018), showed a significant positive correlation between problem-focused coping style and mental health (r=.380, p<.01) and contrast findings that there is significant negative correlation between emotion-focused coping strategies and mental health (r=-473, p<.01). Also findings of the present study correlates with the previous study findings conducted by Khan et al., (2012) in which found that there were positive correlation with problem-focused coping (p=0.00) and contradictory findings that there was statistically significant between total perceived stress with total Dysfunctional coping (p= 0 .026). Gaudel et al.,(2021) reported that more counselling as a coping measure to minimize perceived stress among CAD patients(Gaudel et al., 2021), which was similar to the findings of the present study.

In contrast to the present findings, Melidonis et al., (2015) reported that there is no relationship between perceived psychological stress and coping among CAD patients (Melidonis et al., 2015). This finding of the present study is a contrast to the findings of a study conducted by Vollman et al., (2007) which stated that coping with disease is associated with stress in cardiovascular disease; problem-focused coping (r= -0.23, P=0.4), had reported less likely to have stress. Similarly supportive findings reported that individual who used more emotion coping strategies had more stress (r=0.45, P=.001). This contrast result suggests further research to consider the reason behind data variation.

Conclusion

In this study majority of respondents had moderate stress and almost all respondents used adaptive coping. The most accepted coping measures were problem-focused coping measures respectively. There was no relationship between stress and avoidance/dysfunctional coping. There was a positive relationship between stress and problem-focused coping and emotion-focused coping which revealed that problem-focused coping and emotion-focused coping increase with the increase in severity of stress. Stress is significantly associated with the duration of illness and number of hospitalizations.

Acknowledgements

With a deep sense of gratitude, I owe my sincere indebtedness to a research advisor, Professor Bhuwan Kumari Dangol and co-advisor Lecturer Rachana Ghimire for their continuous support and guidance with insightful comments, constructive feedback and encouragement from the title finalization to the completion of thesis. I owe the informants for sharing vital information. I am appreciative of all the academics whose works served as the study's foundation. Lastly, I owe a debt of gratitude to the journal's editors for their support in assisting me to better articulate my ideas and use language.

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