A Cross-Sectional Study on Quality of Life of Patients with Coronary Artery Disease Attending Out Patient Cardiology Department of a Tertiary Care Hospital, Kolkata, India

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Abstract:

Introduction: Developing countries like India prevalence of coronary artery disease (CAD) is increasing day to day from 1.6 percent to 7.6 percent in rural areas and 1.0 percent to 13.6 percent in urban areas in last few decades and it is going to be a double burden near 2035. Indians are known to have the highest coronary artery disease (CAD) rates. **Objectives:** To find out the socio-demographic characteristics and clinical profile of the patients suffering from coronary artery disease (CAD) attending a tertiary care hospital. This study also assessed the health-related quality of life (HRQOL) of patients. **Method:** A hospital based cross sectional study was done in Patients more than 18 years of age with coronary artery disease attending Cardiology OPD SSKM Hospital in Kolkata. The study was done from the year August 2020 to September 2022. The study was done on 220 patients by using a structured pretested Mac New HRQOL questionnaire. **Results:** The median age of coronary artery disease patients was 56 (50-62) years. Around one-third portion (34.1%) of the study participants achieved a primary level of education. The Median (IQR) of per capita income (Rs/month) of the study participants was 2000 (1250-3938). Nearly three fourth (71.4%) participants had various types of co-morbidities. Clinically, 88.2% had normal heart rates, 51.4% had normal blood pressure and 43.6% had low ejection fraction. MacNew HRQOL score among participants were 4.7,4.8,4.4 in social, emotional and physical domain, respectively. **Conclusion:** Male gender, lower socio-economic conditions, low level of education, inadequate dietary diversity patterns and substance user outnumbered their counterpart. The HRQOL was found satisfactory but lacking in physical domain.

Keywords: Coronary Artery Disease (CAD), Mac-new heart disease health-related questionnaire for health-related quality of life (MACNEW-HRQOL), Quality of Life.

Introduction:

Cardiovascular disease is the most common non-communicable disease-causing death now globally. CAD has been predicted to be the cause of 30.0% of the world's death toll by the year 2030. Ischemic Heart Disease(IHD) was the leading cardio vascular death (CVD) in terms of contribution to total death worldwide (~50%).[1] Among the 18.6 million CVD deaths worldwide in 2019, 58% occurred in Asia.[2] In case of developing countries like India prevalence of CAD is increasing day to day from 1.6 percent to 7.6 percent in rural areas and 1.0 percent to 13.6 percent in urban areas in last few decades. It is going to be a double burden near 2035.[3] For Indians, particular causes of concern in CVD are early age of onset, rapid progression, and high mortality rate. Indians are known to have the highest coronary artery disease (CAD) rates.[4,5]

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The studies are scarce regarding socio-demographic profiles and morbidity profiles lead to lack in knowledge and practice about CAD patients quality of life. There are very few studies in West Bengal and also in India regarding post-treatment Health-related quality of life (HRQOL) status.

With this background this study aimed to assess the socio-demographic characteristics and clinical profile and HRQOL of the patients suffering from coronary artery disease (CAD) attending a tertiary care hospital in Kolkata

Method:

It was a hospital-based cross-sectional study**.** Any patients more than 18 years of age with coronary artery disease attending Cardiology OPD of a tertiary care hospital in Kolkata taken as the study population. The study was done from the year August 2020 to September 2022.

Inclusion criteria: Patients more than 18 years of age having from coronary artery disease with evidence of one or more lesions, >50% severity in a native epicardial coronary artery (left main, left descending, circumflex artery, or right coronary artery) or a major side branch of a native artery diagnosed by angiography at least six months ago who underwent treatment were included in the study.[6] Patients who were unwilling to give consent for participation and who were critically ill were not included in this study.

Sample size

Sample size was calculated by the formula: $N= [Z (1-\alpha/2)]^2 SD^2/d^2$. Z =Standardised normal variate (two-tailed): at 95% CI it was 1.96. σ= Standard Deviation (to be obtained from previous studies) d = Specified precision on either side of the standard deviation. A similar study was conducted at Ataturk training and research hospital, in Izmir, Turkey, by Z.I. Akyildiz et al in 2014.[6] According to that study, the Mean and Standard Deviation of McNew's Heart Disease-related QOL score was 5 & 1.2. The specific precision value (d) is taken at 0.2 according to the study by Hofer S et al.[7] This gives a sample size of ≈139. As design effect 1.5 is multiplied. Thus, Minimum Sample size n =209.Considering 5% non-response rate the final sample size was 220.

Sampling method, Data collection, Study tools and technique

Systematic Random Sampling technique was applied, every tenth patient attending OPD was chosen till per day sample size was completed. This consideration was taken on the basis of the average attendance of patients daily at OPD, sample size of the study and the average time taken for data collection from each participant. Face-to-face interview, anthropometric measurements, clinical examination and review of medical records had been done by the researcher. Predesigned, pre-tested, structured questionnaire containing questions related to sociodemographic questions related to morbidity, behavioural characteristics, clinical profile, clinical measurements and Mac-new heart disease health-related questionnaire for health-related quality of life (HRQOL)[7] was used. The MacNew questionnaire was designed to assess patients' perceptions about how CAD affects daily functioning and it had 27 items with a global HRQOL score and physical limitation, emotional, and social function subscales. Using a 2-week time frame, the MacNew items and subscales were scored from 1 (low HRQL) to 7 (high HRQL).[7] The Mac-New HRQOL score of this study was normally distributed. All ethical principles of a research on human being was followed that was outlined by the institutional ethical committees of AIIH & PH and IPGME & R-SSKMH.

Results:

The median age of coronary artery disease patients was 56 (50-62) years; where the minimum and maximum ages were 32 and 90 years, respectively. Among the study participants, 35.9% belonged to 51-60 years of age group.

Among the study participants, majority (83.2%) were male. Around 57.7% of the study participants permanently lived in urban areas. Sixty six percent of the study participants belonged to joint family. Among the study participants 16.3% were sales workers,14.1% were professionals, 12.7% were agricultural workers. Among the retired participants the last occupation was considered here.

Around one-third portion (34.1%) of the study participants achieved a primary level of education with Median year of schooling of six years. Nearly one-third portion of the study participants (30.9%) belonged to lower class (According to modified B.G Prasad scale 2021).[8] The Median (IQR) of per capita income (Rs/month) of the study participants was 2000(1250-3938). (Table 1)

Nearly one-third (27.2%) had adequate dietary diversity in 24 hour recall method**.** Only 5% of the study participants were practicing a high level of physical activity. Three-fourths (75%) of the study participants were ever substance users. Among the study participants, nearly three fourth (71.4%) had various types of co-morbidities. Among the study participants, 88.2% had normal heart rates, 51.4% had normal blood pressure and 43.6% had low ejection fraction. (Table 2)

Table 1: Socio-demographic characteristics of the study participants (N = 220)

Socio-demographic characteristics		**n (%)**
Age (in completed years)	≤40	22 (10.0)
	41-50	42 (19.1)
	51-60	79 (35.9)
	61-70	64 (29.1)
	>70	13 (5.9)
Gender	Male	183 (83.2)
	Female	37 (16.8)
Residence	Rural	93 (42.3)
	Urban	127 (57.7)
FamilyType	Joint	145 (65.9)
	Nuclear	75 (34.1)
Marital status	Married	209 (95.0)
	Unmarried	5 (2.2)
	Widow/separated	6 (2.8)
Occupation	Skilled	88 (40.0)
	Semiskilled	103 (46.8)
	Unskilled	29 (13.2)
Educational status	Illiterate	33 (15.0)
	Non-formal education	30 (13.6)
	Primary education	75 (34.1)
	Middle school	51 (23.2)
	Secondary education	21 (9.5)
	Higher Secondary	5 (2.3)
	Graduate and above	5 (2.3)
Socioeconomic status[#]	Class I	16 (7.3)
	Class II	39 (17.7)
	Class III	49 (22.3)
	Class IV	68 (30.9)
	Class V	48 (21.8)

* Modified B. G. Prasad Classification 2022

Table 2: Clinical profile among the study participants (N=220)

Clinical profile		n (%)
Acute presenting symptoms*	Chest discomfort	61 (27.7)
	Exertional breathlessness	50 (22.7)
	Palpitation	22 (10.0)
	Sweating	16 (7.2)
	Syncope	2 (0.9)
Co-morbidity*	Hypertension	114 (51.8)
	Anemia	98 (44.5)
	Diabetes	61 (27.7)
	Dyslipidaemia	49 (22.2)
	Psychological morbidity	45 (20.4)
	Renal disease	10 (4.5)
	Respiratory illness	5 (2.2)
Resting heartRate	Normal	194 (88.2)
	Bradycardia	23 (10.4)
	Tachycardia	3 (1.4)
Left ventricular ejection fraction	Normal	124 (56.4)
	Low	96 (43.6)
BMI	Underweight	5 (2.3)
	Normal	69 (31.4)
	Overweight	80 (36.4)
	Obese	66 (30.0)
Treatment status	Angioplasty +anti schemic medications	162 (73.6)
	CABG+ anti-ischemic medications	7 (3.2)
	Only anti-ischemic drugs	51 (23.2)

*Multiple responses possible for these variables

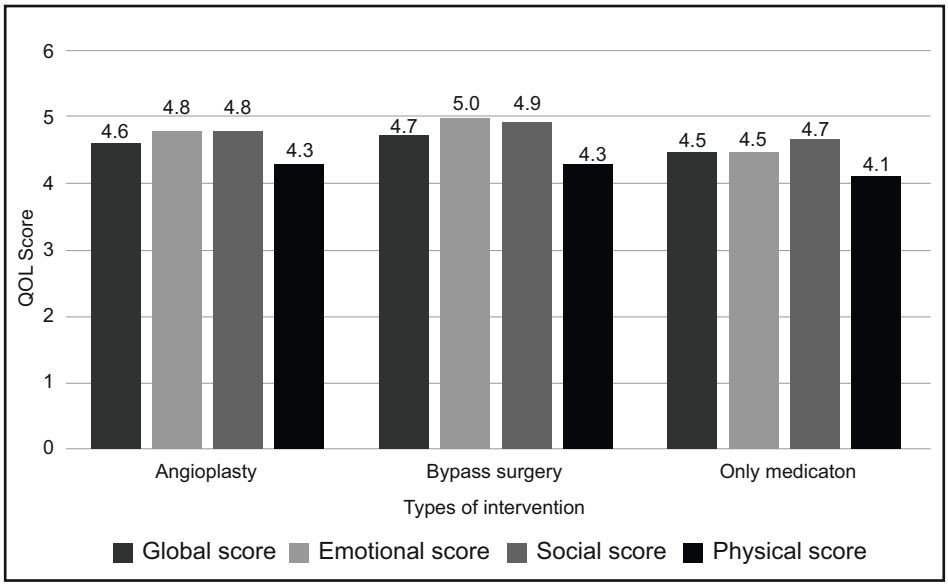
The global score of the MacNew HRQOL Scale among the study participants was 4.7. Score for social, emotional and physical domain was 4.7, 4.8, 4.4, respectively. (Table 3) Score of HRQOL life domains varies with different modes of treatment with higher emotional domain score as compared to physical domain. The participants gone through cardiac bypass grafting had higher QOL score in three domains except physical domain. Physical domains score of QOL was more or less same in all types of treatment modalities. (Figure 1) It was seen that there was a weakly negative correlation between the increasing age and QOL of the study participants. (correlation coefficient: -0.1)

Among the participants, the male had higher QOL than the female. The female gender had a lesser QOL score among the overweight and obese population.

Table 3: Assessment of the quality of life (QOL) of the study participants (N=220)

MacNew QOL score	Mean (SD)
Social score	4.7 (0.4)
Emotional score	4.8 (0.5)
Physical score	4.4 (0.4)
Global score	4.7 (0.4)

Figure 1: Distribution of QOL score in different domain according to different intervention done (N=220)



The participants who belonged to higher socioeconomic classes had higher QOL scores and those who were living in urban areas had better QOL. The participants who used to do high levels of physical activity had better QOL scores and those who never used any substances in their lifetime had better QOL.

It was seen that there was a negative correlation between the increasing age and QOL of the study participants. Male participants were seen to have better QOL than females (independent t value=3.5, p =0.005). Higher educational level among the study participants had with better QOL (f value=4.6, p=0.005). Higher SES among the study participants showed better QOL (f value=4.5, p=0.001). The participants who used to do a high level of physical activity had higher QOL scores and those who never used any substances in their lifetime had better QOL. (Table 4)

Discussion:

In the current study among the study participants around 35.9% were in the fifth decade of life with a median age of fifty-six years. About 10% of the study participants less than forty years of age had significant blockage in the coronary artery. A study was done by De Boer SP et al,[9] showed similar results where the mean age of CAD patients was found to be sixty years. The majority (83.2%) of the study participants were male. Similar results were found in the study done on CAD patients by Pravakaran D et al,[10] and Mandal S et al[11] in Delhi and West Bengal, respectively. A study done by Cook S, et al[12] in Europe found that 71% were male among CAD patients. Around 57.7% of the study participants permanently lived in urban areas and 42.3% were residing in rural areas. The study done by Bhatt P et al[13] showed that nearly 30% of unemployed women had CAD. In the study of O. Bjerkeset et al[14] showed that 75% of the CAD patients were employed. Nearly 34% of the study participants achieved the primary level of education i.e. passed class V. Fifteen percent were illiterate and nearly the same portion had non-formal education. The median years of schooling was six. Bhatt P et, al described that nearly 25% of the CAD had no formal education**.** Only 7.3% of the study participants belonged to upper class. Among the study participants, 30.9% belonged to lower class. The Median (IQR) of per capita income (Rs/month) of the study participants was 2000 (1250-3938). Sudevan R et al[15] studied CAD patients in Southern India and presented that nearly sixty and thirty percent of the CAD patients belonged to middle and lower SES respectively. Calwell M et al[16] found that nearly two third of the women with CAD belonged to middle SES.

Table 4: Distribution of study participants according to Quality of life and socio-demographic profile [N=220]

Socio-demographic profile	Category	Number	Mean (SD) (global score)	Independent t-value */ f-value	p value
Age[#] (years)	≤40	22	4.7 (0.32)	2.2	0.1
	40-60	121	4.6 (0.35)		
	≥60	77	4.5 (0.39)		
Gender	Male	183	4.6 (0.36)	3.5*	0.005
	Female	37	4.5 (0.38)		
Family type	Joint	145	4.5 (0.39)	-2.1*	0.03
	Nuclear	75	4.7 (0.30)		
Marital status	Living with spouse	209	4.6 (0.36)	-1.1*	0.25
	Not living with spouse	11	4.7 (0.37)		
Educational level[#]	Below primary	138	4.6 (0.35)	4.6	0.005
	Up to secondary	51	4.5 (0.38)		
	Above Secondary	31	4.8 (0.31)		
Socioeconomic status (SES)[#]	Class V	48	4.5 (0.32)	4.5	0.001
	Class IV	68	4.5 (0.36)		
	Class III	49	4.6 (0.41)		
	Class II	39	4.7 (0.33)		
	Class I	16	4.8 (0.28)		

[# ANOVA test was done, for other variables independent t-test (two tailed) was done]
[*t values came from independent t test (two tailed) and f values came from ANOVA test]
p values<0.05 were statistically significant

This study showed that 35% of the study participants had consumed just three types of food groups which required a minimum of six types of consumption for being healthy in twenty-four hours. A study done by Mukherjee, et al.[17] in West Bengal showed dietary diversity pattern was similar. The majority (76.4%) of the study participant's physical activity status was low in this study also. The median duration of low physical activity was 10 hours per week. Only 5% of the study participants were practicing a high level of physical activity with a median duration of 14 hours per week.

Among the study participants, nearly two third (63.6%) had acute symptoms in the last fifteen days. The symptoms were chest discomfort (27.7%), exertional breathlessness (22.7%), and palpitation (10%) predominantly.

The participants in the current study had hypertension (51.8%), anemia (44.5%), diabetes (27.7%), dyslipidaemias (22.2%), and psychological morbidities (20.4%) as major comorbidities. Mozaffarian et al[18] showed the prevalence of hypertension (63.4%), Diabetes (26.7%), and Psychological illness (30%) among the study participants. Among the study participants, 88.2% had normal heart rates, 51.4% had normal blood pressure and 43.6% had low ejection fraction. Chan et al[19] showed that the average heart rate of coronary artery disease remained between 62-81 beats per minute and the systolic blood pressure median was 132 with IQR 118-150 beats per minute.

The global score of the MacNew HRQOL Scale among the study participants was normally distributed [Sapiro Wilk test: p value:0.64 (non-significant)]. The social score was 4.7. The emotional domain score was 4.8. The physical domain score was 4.8. The global score was 4.7.

The QOL among the study participants was found to be quite good in global and emotional domains. But it was average in the social domain and slightly reduced in the physical domain among the study participants. Cohen J et al[20] studied in Europe had similar findings. It showed there was an association between physical score and treatment satisfaction and QOL. Z.I. Akyildiz et al showed that Emotional, physical, social, and global scores of QOL tended to decrease across angina or chest pain frequency.

The QOL among the study participants was higher in younger age groups and female participants had lesser QOL scores. A study done by Spertus J A et, al[21] found that males had better HRQOL [OR (CI)1.4 (0.5, 5.6)].

It was seen that there was a negative correlation between the increasing age and QOL of the study participants. The male participants were seen to have better QOL (independent t value=3.5 p=0.005). Nuclear family had better QOL (independent t value= -2.1 p=0.03) found in this study but the result was statistically significant. Cohen D J et al had shown that there was no significant difference in HRQOL across the basic sociodemographic characteristics among CAD patients. Bahramnezhad F et al[22] found low QOL in women in their study. Higher educational level among the study participants was associated with better QOL (f value=4.6 p=0.005). Higher socioeconomic status among the study participants showed better QOL (ANOVA f value=4.5 p=0.001. Prabhakaran D et alfound that individuals from lower socioeconomic backgrounds frequently did not receive optimal therapy, leading to poorer outcomes.

Limitation:

As the study was cross-sectional, temporal relationship could not be established. To establish the causal relation further longitudinal studies would be required. This study was done in a tertiary care center. The participants were selected from patients of the OPD department only. So, the result of the study could not be generalized to all population.

Conclusion and recommendation:

HRQOL global score of the study participants was 4.7, with lower mean score for physical domain as compared to other domains. Lack of physical activity, sociodemographic barrier, substance use, unbalanced diet were considerable factors for HRQOL.

This study showed that people affected by CAD had male predominance. Lower socio-economic conditions, low level of education, inadequate dietary diversity patterns and substance user had lesser HRQOL. The study participants were influenced largely by the presence of co-morbidities, uncontrolled chronic illness with longer duration, adverse cardiac profile, low left ventricular function, and acute debilitating illness.

The prevention of risk factors like low physical activity, unbalanced diet, and quitting of the substance used were the way to reduce burden of CAD and as well as the path to improve health related QOL. The participant should be aware about the risk factors and co morbidities to maintain healthy lifestyle for persuading a good quality of life.

Declaration:

Funding: Nil

Conflict of Interest: Nil

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