

## Health Related Quality of Life of Patients after Cardiac Surgery

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### Abstract

**Introduction:** Cardiovascular disease (CVD) is the primary cause of disability and morbidity in many developed countries around the world. But timely management with cardiac surgery can reduce the mortality.

**Objectives:** To assess the health related quality of life (HRQOL) of the CVD patients after coronary artery bypass grafting (CABG).

**Materials and Methods:** This cross-sectional observational study was carried out among purposively selected CABG patients from January to December 2013. A total of 78 post CABG patients were interviewed with short form health survey (SF-36) questionnaire at different hospitals in Dhaka.

**Results:** The study patients age ranged from 40 to 82 years and the proportion were higher among those of more than 60 years (38.5%) of age. Majority (48.7%) were educated up to HSC level. Explaining the characteristics of illness, the average duration of sufferings was 121.91±115.31 days and Post treatment duration in month was 14.97±19.25. The study findings showed a good level of QOL; with an average score of 78.2. The mental and physical components scores were 79.9 & 77.1 respectively. There were statistically significant ( $p < 0.001$ ) negative association between age and total component of quality of life of patients. In relation with sex, average total quality of life scores of male and female were 80.5±10.5 and 74.4±14 respectively which was statistically significant ( $p < 0.001$ ). Similarly, comparing to pre-treatment state, statistically significant ( $p < 0.001$ ) difference was found between groups quality of life. Similarly statistically significant difference was found with occupation in relation to total quality of life ( $p < 0.001$ ), physical component ( $p < 0.01$ ) and with mental component ( $p < 0.05$ ) of participants.

**Conclusion:** Subjective perceptions of physical and psychological well-being changed significantly from before treatment to at least 3 months after treatment and better HRQOL noticed among patients treated with CABG.

**Key-words:** Quality of life, Coronary Artery Bypass Grafting, Cardiac surgery.

### Introduction

Cardiovascular disease (CVD) is the primary cause of disability and morbidity in many developed countries around the world and considered as the leading cause of death in many countries<sup>1</sup>. More so, rapid increases in cardiovascular diseases are expected in the near future to be an alarming threat in the developing countries. Coronary artery disease (CAD) or atherosclerotic heart disease is the end result of the accumulation of atheromatous plaques within the walls of the coronary arteries. It is sometimes also called coronary heart disease (CHD). Coronary angioplasty and coronary artery bypass grafting (CABG) are two important techniques in the management of cardiovascular disease. CABG is the surgical intervention available for the treatment of CAD<sup>1</sup>. After the introduction of CABG in 1968, the use of this invasive procedure for coronary revascularization has rapidly expanded. The results in longer survival and a better health related quality of life (HRQOL); and individuals with cardiovascular disease should maintain lifestyle adjustments for the improvement of their cardiac health in order to reduce the risk of re-occlusion<sup>2</sup>.

In medicine, the concept of HRQOL refers to a person or groups perceived physical and mental health over time. Public health professionals use HRQOL to measure the effects of numerous disorders, short and long-term disabilities, and disease in different populations. Tracking HRQOL in different populations can identify subgroups with poor physical or mental health and can guide policies or interventions to improve their health<sup>3</sup>. The HRQOL may also be defined as 'an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns'. Several instruments are available to assess changes in HRQOL, especially in patients with CAD. The Short Form Health Survey (SF-36) questionnaire is one of the most widely generic health status instruments used extensively in cardiac patient populations<sup>4</sup>. It is also important

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for patients to achieve the HRQOL, postoperatively, that they desire. A major intervention that does not improve HRQOL is not considered successful in terms of the global meaning of health. This study will increase understanding about the characteristics of illness and implications of HRQOL to measure post CABG patients.

## Materials and Methods

This cross-sectional observational study was conducted to post CABG patients, in several hospitals in Dhaka city. Health-related quality of life was assessed after 3 months or more duration of CABG procedure to the participated 78 patients who attended for their review and follow up at the cardiac medicine and surgery outpatient department of four hospitals. The Exclusion Criteria includes: (a) the patients who already developed post operative complications. (b) Conditions co-morbid to coronary artery disease eg Stroke, COPD/ Bronchial Asthma, Chronic renal failure. (c) The patients who are unable to responds and (d) the patients who are unwilling to participate. Questionnaires were administered in each patient's native language and Face to face interview was taken with short form health survey (SF-36) questionnaire, related to: (a) Socio demographic characteristics of the respondents, (b) Characteristics of illness of patients, (c) Health status of the respondents and (d) The HRQOL of the patients after CABG procedure.

*Measurement of health status:* Short-Form Health Survey (SF-36) is a tool which was derived from the work of the Rand Corporation and widely used for measuring self-reported physical and mental health status. These are generic, multi-dimensional measures of self-reported health status which consists of 36 questions (items) measuring physical and mental health status in relation to eight health concepts (physical functioning, role physical, bodily pain, general health, vitality, social functioning, role emotional, mental health). Responses to each of the SF-36 items are scored and summed according to a standardized scoring protocol and expressed as a score on a 0–100 scale for each of the eight health concepts. So, using this HRQOL here assessed the physical, social, functional and emotional well-being of every individual who have competed CABG operation at least three months back.

## Results

The age of the CABG completed patients ranged from 40 to 82 years. The proportion was higher among those of more than 60 years (38.5%) of age. Mean age was  $60.88 \pm 12.070$  years. Male participants were more common (89.7%). According to the marital status of the patients, majority were married (92.3 %). Majority (48.7%) were educated upto HSC

level. The distributions of occupation of the participants were mostly businessman (41%). To compare monthly family expenditure of the respondents, highest number of participants (34.6%) had their monthly expenditure more than 40,000 and least expense was between Tk. 31000-40000 (17.9%). The average monthly expenditure of the respondents was Tk.  $36846 \pm 22301$  (Table-I). Mean duration of sufferings (duration from diagnosis to treatment) was  $121.91 \pm 115.31$  days and Post treatment duration was  $14.97 \pm 19.25$  months. The ECG report was available among 54 participants and large portions had the ECG report with no significant positive findings (59.3%). Among the significant findings, proportionately old myocardial infarction (MI) was found higher than acute MI. Among the patients 37.9% had reports of ECHO. Highest number of patients had ejection fraction more than 65%. According to the angiogram report, proportions of both double & single vessel CAD were higher (49.2% & 23.9%). Out of 78 numbers of cases only 08 respondents (10.4%) found having any associated illness. Majority of the respondents felt better during the period of data collection than their previous time (76.9%) and the proportion of feeling same as before was 10.3% and worse was 12.8%.

HRQOL of patients was revealed that in physical functioning mean score was  $816.1 \pm 14.1$  out of possible maximum score of 1000. Accordingly in case of role physical mean score was  $804.4 \pm 31.8$  out of maximum possible 400 score. For bodily pain, out of 200 score mean was  $860.9 \pm 17.6$  and for general health, out of 500 score, mean was  $615.3 \pm 21.5$ . For the mental component, mean score was  $696.1 \pm 19.2$  out of possible maximum score of 400. Accordingly in case of social functioning, out of 200 score, mean score was  $879.8 \pm 16.8$ . For role emotional, out of 300 mean score was  $837.6 \pm 29.0$  and for mental health, out of 500 mean score was  $825.1 \pm 11.7$ . The Mean score of physical component were  $77.04 \pm 12.37$  and Mental component was  $79.88 (\pm 11.03)$ . Mean score generated from all eight domains were  $78.17 \pm 10.92$ .

*Relationship with sex:* Average total quality of life scores of male and female were  $80.5 \pm 10.5$  and  $74.4 \pm 14$  respectively, which was statistically significant ( $t = 3.858$  and  $p < 0.001$ ). Average physical quality of life scores of male and female were  $78.4 \pm 11.5$  and  $64.7 \pm 12.9$  respectively, which was statistically significant ( $t = 3.153$  and  $p = 0.002$ ). But, the mental quality of life scores of male and female were not statistically significant. Mean ( $\pm$ SD) of mental quality of life were  $78.4 \pm 11.5$  and  $64.7 \pm 12.9$  respectively, ( $t = 1.487$ ,  $p = 0.0762$ ). Health state, compared to pre-treatment state: One way ANOVA was done to see whether health state has any

association with quality of life. A statistically significant difference was found between groups ( $F = 18.27, p < 0.001$ ) with total quality of life. Hochberg post-hoc test revealed that there was significant difference in mean total scores in 'worse than previous time' with 'better than previous time' group ( $p = 0.002$ ) and 'same as previous time' group ( $p = 0.044$ ). In case of physical and mental component, a statistically significant difference was found between groups ( $F = 18.27, p < 0.001$ ) and ( $F = 12.09, p < 0.001$ ) respectively. Educational level and occupation: The Total ( $9.180, p < 0.003$ ), Physical ( $f = 7.855, p = 0.001$ ) and mental quality of life ( $f = 4.649, p = 0.012$ ) in relation to educational level was statistically significant. Similarly statistically significant difference was found with occupation in relation to total quality of life ( $f = 6.193, p = 0.001$ ), physical component ( $f = 4.982, p = 0.003$ )

and with mental component ( $f = 4.653, p = 0.005$ ) of participants (table-II).

**Table-I:** Correlation between different socio demographic characteristics and HRQOL of CABG treated patients.

Domain	Total quality of life r value (p value)	Physical component r (p)	Mental component r (p)
Age	-0.580 (<0.001)	-0.541 (<0.001)	-0.510 (<0.001)
Monthly expenditure	0.151 (ns)	0.172 (ns)	0.082 (ns)
Duration of sufferings	-0.157 (ns)	-0.181 (ns)	-0.078 (ns)
Post treatment period	-0.309 (<0.01)	-0.372 (<0.001)	-0.142 (ns)

• Pearson's correlation test was performed

**Table-II:** Association between different socio-demographic and health related characteristics with patients HRQOL.

Domain		Total quality of life		Physical component		Mental component	
		Mean ±SD	f	Mean ±SD	f	Mean ±SD	f
Sex	Male	80.5 ± 10.5	* 2.716 p= 0.12	78.4±11.5	* 3.153 p- 0.002	80.5±10.5	*1.487 p = ns
	Female	74.4 ± 14.5		64.7 ±12.9		74.4 ±14.5	
Compare health state	Better	81.2 ± 8.25	8.091 p< 0.001	80.2±9.63	27.35 p< 0.001	81±9.748	12.09 p<0.001
	Same	77.2 ± 13.3		78.3±12.4		82.6±8.67	
	Worse	60.7 ± 6.03		56.6±7.11		75.5±15.4	
Education Level	Up to HSC	73.5 ± 13.1	9.180 p< 0.003	73.5±13.1	7.855 p=0.001	76.2±12.1	4.649 p=0.012
	BA	83.4 ± 9.58		83.4±9.58		82.2±7.27	
	Above BA	75.2 ± 10.6		82.9±9.28		84.6±10.3	
Occupation	Service	82.5 ± 9.28	6.193 p= 0.001	81.9±11.9	4.982 p=0.003	85.1±9.43	4.653 p=0.005
	Business	81.3 ± 8.98		81.1±10.3		80.5±9.23	
	Housewife	71.4 ± 10.2		67.3±12.5		70.8±14.5	
	Others	78.2 ± 9.49		78.9±10.9		75.2±11.7	
Angio gram Report	Single vessel	82.4 ± 7.36	1.500 p= ns	82.4±9.32	1.891 p= ns	85.1±9.43	1.761 p= ns
	Double vessel	78.0±10.0		76.5±12.3		78.8±10.6	
	Triple vessel	78.6±11.2		77.1±14.4		78.9±14.1	

\* t test and One-way ANOVA test was performed

## Discussion

In this study, majority 30 (51.2%) CABG patients were in the age group of  $\geq 60$  years of age. None of the participants were below the age of 40 years. Mean age of the patients were 60.88 ( $\pm 12.07$ ) years. It corresponds with the finding of G U Ahmed at BIRDEM hospital which reflected that highest frequency of patients was in the age group of 41-60 years which is almost similar to this study<sup>5</sup>. This study finding is also similar to the study finding observed in another study<sup>6</sup>, where the mean ages for coronary artery disease were between 40-60 years. Another study shows, in men, this increase usually levels off around the age of 45 to 50 years, whereas in women, the increase continues sharply until the age of 60 to 65 years<sup>7</sup>.

Majority of the patients were male and male were significantly ( $\chi^2 = 5.419, p = 0.020$ ) higher than female with the association of principal treatment procedure (CABG). A study was carried

out regarding quality of life of CABG operation in elderly people who revealed that females were minority<sup>8</sup> and another study with randomized trial comparing PCI and CABG showed 74.7% of PCI and 72.7 % of CABG patients were men<sup>9</sup> for coronary disease which is similar to this study. A similar result was found in a study 'Surgical revascularization is associated with improved long-term outcomes compared with percutaneous stenting in most subgroups of patients with multi vessels coronary artery disease' which showed male was 76.5%<sup>10</sup>.

It is evident from the study that 98.7% of respondents were Muslim and rests were Hindu and Christian. More so, Fisher's exact test revealed significant association between religion of the respondent and Principal treatment procedure (CABG) ( $\chi^2 = 7.176, p = 0.028$ ). On the other hand, no significant association disseminated between any components of quality of life (total, physical or mental component) to

religion. The distribution of cases according to spiritual believe did not correspond to BBS findings, where it was shown that the religion of people in Bangladesh was 89.6% Muslim, 9.3% Hindus and rest 0.2% were others (Bangladesh Bureau of Statistics 2013)<sup>11</sup>. This difference may be due to small sample size.

As per profession, maximum numbers were Businessman (41%). Succeeding participants were service holder (28.2%). Other mixed occupation (23.1%) and housewife (7.7%). Statistically significant differences were found between groups of occupation in relation to quality of life of patients. A study showed the job strain and prevalence of coronary heart disease also revealed a significant association between occupational pattern and coronary heart disease<sup>12</sup>. In this study, average monthly expenditure of the respondents was Tk. 36846. The average expenditure was higher than average monthly household expenditure in Bangladesh<sup>13</sup> (Tk. 11,200). This variation may be due to high cost of principal treatment procedure that could not be affordable by those who were in low economical condition.

The characteristics include diagnosis, previous cardiac illness and routine of reporting. Illness characteristics were entered as explanatory variables. The significant independent variables identified were Time line; Identify associated diseases, Route of admission/reporting and Control/cure<sup>14</sup>. The history is by far the most important factor in making the diagnosing the illness characteristics<sup>15</sup>. Total 29 patients could present their ECHO reports. The result conveyed that 34.5% patients had EF less than 55%. Correspondingly, another study showed EF was 33%<sup>16</sup>. Coronary angiography remains the 'gold standard' in depicting CAD<sup>16</sup>. The result of this study showed that post CABG patients (reported different referral level of hospitals in Dhaka) had good quality of life. Most respondents' quality of life improved after CABG operation and similar results were found<sup>17</sup>. A study on HRQOL after Coronary bypass surgery in high-risk patients with medically refractory ischemia in subgroup analyses showed that there were no significant differences in PCS or MCS scores for the age, race, prior CABG surgery, recent MI and diabetes<sup>18</sup>.

## Conclusion

The total HRQOL, physical and mental components of HRQOL had some significant relation with Age, sex, marital status, education, occupation and health state. This study showed that overall quality of life score was high after CABG procedure.

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