Original Article

How does Coronary Artery Bypass Graft Surgery Affect Body Image?

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Abstract

Background: Coronary artery bypass graft (CABG) surgery is commonly used to treat coronary artery disease. However, it is associated with significant physical and psychological problems. **Objectives:** This study was conducted to examine how body image changes after CABG surgery. **Methods:** This descriptive-correlational study was conducted on 140 patients consecutively recruited from Shahid Beheshti Medical Center, Kashan, Iran. The Multidimensional Body-Self Relations Questionnaire was used to assess the body image (BI) before, 2 weeks, and 4 weeks after the surgery (T1–T3). The independent-samples *t*-test and one-way and the repeated measures analyses of variance were conducted for data analysis. **Results:** Participants' possessed 60.69 ± 5.74, 67.67 ± 4.48, and 69.67 ± 3.37 percent of the BI scores at T1 to T3, respectively. The variations of BI scores were statistically significant across the measurement time points ($P = 0.01$). Male participants' BI was significantly better than females only at T2 ($P < 0.01$). BI had significant relationships with age, marital status, and educational status at T1, and employment status at T1 and T2 ($P < 0.05$). Similarly, single patients had better BI than their married counterparts ($P = 0.02$). **Conclusions:** CABG surgery improves BI. Considering the effects of BI on the patients' self-care behaviors, nurses should assess the cardiac patients BI, especially before surgery and employ programs for improving the patients BI.

Keywords: *Body image, Coronary artery bypass, Coronary artery disease, Iran, Nursing*

Introduction

Coronary artery bypass graft (CABG) surgery is one of the most principal treatments for serious coronary artery disease.[1-4] Around 35,000–50,000 CABG surgeries are annually performed in Iran.[4,5] Although CABG is safe and effective, it has adverse psychological effects.[6,7] Patients who undergo CABG suffer from a variety of problems such as preoperative and postoperative anxiety and stress,[8] delirium, sleep problems,[9,10] psychological and mental disorders,[11] and low quality of life.[12] Some studies have also reported that these patients may suffer from degrees of BI disorder.[13,14]

BI is a subjective experience each person has of his/her own body and is considered an important component of personal identity.[15] It includes negative and positive thoughts, beliefs, attitudes, and feelings each person has about his/her body.[16] BI and its alterations severely affect daily life.[17] Dissatisfaction with BI can cause physical, psychological, and social problems such as reduced self-confidence and self-esteem, low quality of life, and social isolation.[18,19] It is also an antecedent of depression, anxiety, and sexual disorders[20] and can negatively affect the patient's lifestyle and self-care behaviors. Such negative changes require extensive physical and emotional care to restore optimal functioning. Therefore, disturb BI is an important nursing diagnosis during severe diseases and major surgeries and nurses are responsible to assess and identify the effects of diseases and surgeries on the patients' BI to plan suitable strategies and rehabilitation

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programs, and to help their patients appropriately cope with the condition.[20-22] A study reported that 75% of patients in cardiac care wards and coronary care units suffer from BI alterations.[23] Different studies have been conducted into BI among different patient populations such as cancer patients,[24] patients receiving dialysis and kidney transplantation,[25] and those with dermatologic problems.[26] A number of studies also reported that CABG candidates are at risk for significant alterations in BI.[14,27-29] However, our extensive online search revealed that only one study had assessed BI among Iranian patients who had undergone CABG. The results of the study illustrated that BI alteration among patients undergoing CABG was more common than patients undergoing valvular heart surgeries.[14] A study also reported that altered BI can impede the process of rehabilitation after heart surgeries.[27] Despite the increasing number of CABG surgery, no study compared the patients BI before and after CABG surgery. Given the paucity of studies in this area, the question still remained unanswered that how BI changes after the CABG.

Objectives

This study sought to examine how BI changes after CABG surgery.

Methods

Design and participants

This correlational, longitudinal study was conducted in 2017, on 140 patients who had undergone CABG in the Shahid Beheshti Medical Center of Kashan, Iran. The sample size was determined using the formula for a finite population and based on the findings of a former study[14] and with a standard deviation of 0.7, a type I error of 0.05, and a measurement precision (*d*) of 0.082.

Eligibility criteria were CABG candidacy based on the cardiologist's diagnosis, no known and active psychiatric disorder, and no history of severe burn.

Data collection instruments

A demographic data sheet and the 46-item Multidimensional Body-Self Relation Questionnaire (MBSRQ) were used. This questionnaire was developed by Cash *et al*. for BI assessment.[30] MBSRQ included six subscales, namely appearance evaluation (AE, seven items), appearance orientation (AO, 12 items), fitness evaluation (FE, three items), fitness orientation (FO, 13 items), subjective weight (SW, two items), and body areas satisfaction (nine items). Items were scored from 1 (Completely disagree) to 5 (Completely agree). The possible total score of MBSRQ is 46–230, with greater scores showing better BI. In this study we presented the percentages of the scores. The Cronbach's alpha of the questionnaire was reported 0.84.[31]

Data were collected 1 day before CABG (T1), 2 weeks after (T2), and 1 month after it (T3). As some patients were illiterate, data collection was done through individual structured interviews in a private environment. The first measurement was done during participants' hospital stay, whereas the second and the third were done at an outpatient cardiac rehabilitation center in the study setting (i.e. when the patients came back for follow-up and rehabilitation schedules).

Ethical considerations

This study has the ethical approval of the Ethics Committee of Kashan University of Medical Sciences, Kashan, Iran (approval code: IR.KAUMSREC.1396.23). We informed patients about the study aim, guaranteed the confidentiality of their data, and asked them to sign an informed consent form before participation. All the questionnaires were anonymous, and all the patients were informed that their participation is voluntary.

Data analysis

Data were analyzed through the SPSS for Windows software (v. 13.0, SPSS Inc., Chicago, IL, USA). The independent-samples *t*-test and the one-way analysis of variance were conducted to compare the mean MBSRQ scores and its subscales between the participants' subgroups. Moreover, the repeated measures analysis was performed to compare the variations of the total score of MBSRQ across the three measurement time points. Linear regression analysis was also performed to determine which personal or clinical variables can predict BI.

Results

Among 140 participants, 53.6% were male, 87.9% were married, 75% had below high school diploma, 34.3% were retired, and 51.4% were overweight. The means of their age, height, weight, and BMI were 55.71 ± 4.52 (years), 1.61 ± 10.22 (m), 80.15 ± 11.97 (kg), and 29.82 ± 2.90 (kg/m^2), respectively.

Patients possessed 60.69 ± 5.74, 67.67 ± 4.48, and 69.67 ± 3.37 percent of the BI scores at T1 to T3, respectively.

In repeated measures analysis, the result of Mauchly's test of sphericity was statistically significant ($P = 0.02$). Therefore, the Greenhouse-Geisser test was employed and showed the significant variations of the mean score of BI across the three measurement time points ($F = 149.17$; df: 1.29; $P = 0.01$) [Table 1].

The factors of age, height, weight, BMI, gender, marital status, educational status, employment status,

tranquilizer use, and having other comorbidities were entered into the repeated measures model as covariates. Results showed that only the effects of age.

(P = 0.01) and gender (P = 0.02) were statistically significant.

Linear regression analysis was used to evaluate the effects of demographic and clinical characteristic on BI. At T1, only the three factors of age, education, and employment status were significant predictors of BI [Table 2]. At T2, only the participants' age and gender significantly predicted 35% of the total variance of BI [Table 3]. However, at T3, none of the factors were a significant predictor of BI.

As shown in Table 4, no significant difference was found between male and female participants respecting BI score at T1 and T3 ($P > 0.05$), while male participants' BI score at T2 was significantly greater than their female counterparts ($P < 0.01$). Moreover, single participants had significantly better BI score at T1 compared to their married counterparts ($P = 0.02$), while they did not significantly differ from each other at T2 and T3 ($P > 0.05$). Participants who aged 40–50 years also obtained significantly greater BI score at T1 compared to older participants ($P = 0.01$); however, the differences among age groups respecting BI score were not statistically significant at T2 and T3 ($P > 0.05$).

Similarly, patients with diploma and university degrees had significantly better BI score at T1 compared to patients with below-diploma educations ($P < 0.01$), while the differences between these two groups were not statistically significant at T2 and T3 ($P > 0.05$). Participants who were white-collar employees also obtained significantly better BI score at T1 than patients with other employment status. At T2, BI score among patients who were employees, self-employed, and retired was significantly greater than their housewife counterparts ($P < 0.01$). However, there was no significant difference among patients with different employment status respecting BI score at T3 ($P = 0.62$). Besides, patients who did not use tranquilizers had better BI score at T1 compared to those who used these medications ($P = 0.03$), while this difference was not statistically significant at T2 and T3 ($P > 0.05$). Finally, BI score had no significant relationships with BMI and history of underlying diseases ($P > 0.05$).

Discussion

Study findings showed that the score of BI at T1 was lower than the scores at T2 and T3. Similarly, a study reported that the candidates for kidney transplantation had significantly lower BI score compared with transplant recipients.[25] Although we did not assess the patients' psychological status, studies reported that severely diseased cardiac patients and CABG candidates are anxious and have the poor psychological condition before the CABG.[32-35] Then, the poorer BI before surgery might be attributed to patients' poor preoperative psychological status as well as fear and anxiety over surgery and death. Moreover, patients' lack of knowledge about surgery, pre- and post-operative care, and surgical complications and outcomes can adversely affect their psychological status and BI.[36,37]

Study findings revealed that the percentage of BI scores had an upward trend during the study so that at T2 and T3 patients scored greater than T1. Although we did not assess the patients' physical and psychological status before and after the surgery, the observed changes in the BI might be attributable to the improvements in physical conditions, reduction of cardiac problems, greater ability to perform the activities of daily living, and most importantly, better psychological status due to the lower levels of postoperative fear and anxiety.

Findings also indicated that although male and female participants did not significantly differ from each other respecting BI score at T1 and T3, male participants' BI score was significantly greater at T2. BI is more important to women and hence, they greatly value makeup and physical appearance[38] and are more easily

Table 1: Variations of the percentage scores of body image and its dimensions across the three measurement time points[a]

BI domains	Time			P^b
	Before	After 2 weeks	After 1 month	
Total	60.69±5.74	67.67±4.48	69.67±3.37	<0.001
Appearance evaluation	62.42±8.48	66.74±7.34	69.34±6.88	<0.001
Appearance orientation	59.11±7.86	69.06±6.08	68.81±5.30	<0.001
Fitness evaluation	52.4±11.26	66.13±10.73	67.46±9.93	<0.001
Fitness orientation	56.18±7.67	68.58±6.23	70.13±5.24	<0.001
Subjective weight	72.60±15.8	71.6±14.8	63.0±12.5	<0.001
Body areas satisfaction	68.04±9.75	64.82±7.33	72.57±6.35	<0.001

[a]Data presented as mean±SD, [b]The results of the repeated measures ANOVA. SD: Standard deviation, ANOVA: Analysis of variance, BI: Body image

Table 2: The results of the regression analysis for the predictors of body image at T1

Model	Unstandardized coefficients		Standardized coefficients,β	*T*	*P*
	B	SE			
Constant	166.702	14.328		11.635	<0.000
Education	9.501	2.449	0.312	3.880	<0.000
Age	−0.586	0.237	−0.201	−2.477	0.014
Employment	−2.180	1.072	−0.159	−2.034	0.044

r^2=0.23. SE: Standard error

Table 3: The results of the regression analysis for the predictors of body image at T2

Model	Unstandardized coefficients		Standardized coefficients, β	*T*	*P*
	B	SE			
Constant	153.988	9.258		16.632	<0.000
Employment	−1.885	0.958	−0.176	−1.967	0.051
Gender	−9.719	1.781	−0.471	−5.457	<0.000
Age	0.383	0.166	0.168	2.301	0.023

r^2=0.3. SE: Standard error

Table 4: Participant's body image percentage scores at different measurement time points based on their characteristics[a]

Characteristics	*n* (%)	Time					
		Before	P^b	After 2 weeks	P^b	After 1 month	P^b
Gender							
Male	75 (53.6)	60.44±5.19	0.579	64.88±3.87	0.001	70.09±2.80	0.110
Female	65 (46.4)	60.99±6.35		70.08±3.47		69.18±3.89	
Marital status							
Married	123 (87.9)	60.13±5.35	0.002	67.67±4.42	0.999	69.60±3.32	0.533
Single	17 (12.1)	64.78±6.93		67.67±5.03		70.15±3.76	
Age (years)							
40-50	33 (23.6)	63.52±6.98	0.001	66.49±4.82	0.225	69.42±3.84	0.886
5160	89 (63.3)	60.25±5.26		68.06±4.41		69.75±3.32	
>60	18 (12.9)	57.70±2.91		67.92±4.03		69.73±2.73	
Educational status							
Below-diploma	105 (75)	59.30±4.59	0.001	67.77±4.46	0.628	69.55±3.00	0.463
Diploma and higher	35 (25)	64.87±6.81		67.35±4.58		70.03±4.30	
Employment							
Employee	13 (9.3)	66.62±6.42	0.001	69.03±3.73	0.001	70.30±3.04	0.620
Self-employed	34 (24.3)	60.30±4.79		69.04±3.28		70.14±2.76	
Housewife	45 (32.1)	58.86±4.63		64.07±3.82		69.27±4.08	
Retired	48 (34.3)	61.08±6.14		69.71±4.03		69.54±3.13	
History of other comorbidities							
Yes	103 (76.3)	60.30±5.68	0.185	67.59±4.40	0.726	69.76±3.20	0.567
No	37 (26.4)	61.77±5.85		67.46±4.76		69.40±3.83	
BMI							
18.524.9	6 (4.3)	57.89±4.20	0.073	63.98±4.83	0.084	70.36±3.30	0.163
25-29.9	72 (51.4)	61.38±6.31		68.28±4.14		70.05±3.70	
30-34.9	52 (37.1)	60.80±4.92		67.55±4.78		69.46±2.96	
35-39.5	10 (7.1)	56.86±4.73		66.10±4.22		67.60±2.18	

[a]Data presented as *n* (%) or mean±SD, [b]The results of the independent sample *t*-test or the one-way ANOVA. SD: Standard deviation, ANOVA: Analysis of variance, BMI: Body mass index

affected by others' perceptions and attitudes toward their bodies. Perhaps, CABG-related wounds, scars, bruising, and hematoma might have affected female participants' BI more severely than their male counterparts at T2. The insignificant difference between male and female participants at T3 can also be attributed to the improvements in physical and psychological conditions as well as to the alleviation of CABG-related problems. These findings are in line with the findings of an earlier study into the effects of BI alterations on quality of life.[27]

Another finding of the study was that participants with higher educational status had better BI at T1 compared to those with lower educational status. Previous studies also reported the same finding.[27,39,40] This finding may be due to the greater level of health-related knowledge and greater coping abilities among participants with higher educational status.[41] Moreover, people with higher educational status are more competent in searching and using information about health, illness, and self-care and have better attitudes toward treatments.[41,42] At T2 and T3, there were no significant differences between patients with high- and low-educational status respecting BI score. This can be attributed to the improvements in perceptions and attitudes about CABG and self-care among all patients (including those with lower educational status) as a result of experiencing the surgery and receiving self-care educations during the postoperative period.

We also found poorer BI among older participants at T1. Two earlier studies also reported the same finding.[25,43] Because of age-related problems and impaired physical and mental functioning, older people may have greater fear and anxiety over CABG and its complications.[44,45] However, at T2 and T3, older and younger participants did not significantly differ respecting BI. This finding can also be attributed to fear and anxiety alleviation among older people after CABG.

Another study finding was better BI among single participants compared to their married counterparts at T1 and no significant difference between them at T2 and T3. Poorer BI among married participants might have been due to their greater concern about their marital relationships, spouses, and children. Of course, contrary to our findings, a former study into the comparison of BI among hemodialysis patients and kidney transplant recipients reported no significant difference between the BI of married and single patients.[25] It is noteworthy that the number of single patients in the present study was much lower than married ones and hence, further comparative studies are needed to provide firmer evidence respecting married and single CABG candidates' BI.

Respecting employment status, our findings indicated that at T1, participants who were white-collar employees had better BI compared with other participants, while at T2, housewives had poorer BI than others. An explanation for the better BI among white-collar employees may be the fact that they have better job security, lower concerns, stress, and anxiety over income and employment,[44] and hence, have more positive attitudes toward life and better perception about self. However, at T3, there was no significant difference among different occupational groups respecting BI, probably due to the decreases in the levels of stress and anxiety and subsequent improvements in BI. These findings were in line with the findings reported in an earlier study.[40]

Regression analysis also showed that the predictors of BI at T1 were age, educational level, and employment status. The significant effects of these factors on BI at T1 can be attributed to the differences among patients of different age groups, different educational degrees, and different employment status respecting their health literacy, attitudes, anxiety, and psychological status. For the same reasons, educational level and employment status were no longer among the predictors of BI at T2. At this time point, the significant predictors of BI were age and gender, whereas at T3, none of the study variables significantly predicted BI. The significant effects of gender on BI at T2 can be attributed to the greater effects of CABG-related physical changes on BI among women. Similarly, the insignificant effect of gender on BI at T3 is attributable to the improvements in physical appearance and conditions.

One limitation of the present study was that the study was conducted in a single hospital setting and hence, large-scale multicenter studies are recommended to compare the variations of BI during pre- and post-CABG periods. Moreover, regression analysis in the present study showed that study variables explained the variance of BI by only 23% at T1 and 35% at T2. In other words, around 70% of the variance has been related to factors not assessed in this study. Thus, future studies are recommended to assess the effects of other factors such as stress, anxiety, and social and familial support on BI.

Conclusions

This study suggests that BI has been improved after CABG. Moreover, male CABG candidates as well as candidates with younger ages, higher educational degrees, and white-collar employment have better BI. Considering the effects of BI on the patients' self-care behaviors, nurses, and other health-care providers need to assess the cardiac patients BI, especially before surgery and employ programs for improving the patients BI. Moreover, although the BI scores of the patients have improved after the surgery, nurses are also responsible to assess the effect of the surgery on the patients' BI and implement suitable rehabilitation programs to augment the positive effects of surgery on the patients' BI.

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Conflicts of interest

There are no conflicts of interest.

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