

## Functional Health Status Assessment for Patients Undergoing Coronary Artery Bypass Graft

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### Abstract

**Background:** Functional health status assessment among patients with a coronary artery bypass graft (CABG) over time is very crucial. **Aim:** to determine the functional health status of patients undergoing coronary artery bypass graft. **Research design:** A descriptive exploratory research design. **Setting:** The study was conducted in cardiothoracic surgery department at Assiut University Heart Hospital. **Sample:** A purposive sample of 100 adult male and female patients. **Tools:** Tool (I) Patient assessment sheet and Tool (II) Biopsychosocial functional health status. **Results:** The majority of the studied patients had a partially dependent physical function in the pre (68%) and post-operative phase (66.0%) while follow-up was independent (36.4%). Moderate psychological distress was reported in three phases (preoperative (51.0%), postoperative (81.0%), and follow-up phase (93.0%). Also, moderate social dysfunction in the preoperative period was experienced by patients (57.0%) while they had mild social dysfunction in the post-operative (31.0%) and follow-up phases (2.0%). **Conclusion:** Functional health status was improved after (CABG) surgery in the follow-up phase, particularly in physical function. **Recommendations:** Establishing a simplified and illustrated educational booklet regarding therapeutic compliance to improve functional health status for patients undergoing coronary artery bypass graft.

**Keywords:** Coronary artery bypasses graft & Functional Health status.

### Introduction:

A coronary artery bypass graft (CABG) is a type of surgery utilized to remove a blockage in one of the blood vessels that supply the heart muscle. To create new pathways utilizing autologous blood vessels to "bypass," the affected coronary artery, surgery involves cutting the affected coronary artery above and below the blockage. A smaller loop of the vein (saphenous) or artery (mamillary) is then attached at each cut (Kim, 2022).

Coronary revascularization techniques have been improved by surgeons to increase clinical effectiveness, reduce costs, and reduce invasiveness. For CABG patient-reported outcomes range from a decrease in symptom burden, such as shortness of breath and chest pain, to a return to self-care and daily activities as usual (Chaudhari et al., 2022).

Patients who have coronary artery disease (CAD) have several treatment options, including coronary artery bypass graft (CABG) surgery, which has positive effects on them by enhancing their three domains of functioning, health status, and quality of life (QoL) (Rengo et al., 2022).

Functional status is the state of being able to do activities including walking, bathing, dressing, getting out of bed, and using the bathroom (FS). It is

an essential component of life quality, an effective survival predictor, a consideration in decisions about medical treatments like the use of feeding tubes or cardiopulmonary resuscitation, and a factor in caregiving needs and medical expense estimates. (Sayed et al., 2021).

The assessment of a person's functional health status is performed to see whether there has been an improvement in their cardiac activity, which is represented in their daily activities. In reality, one of the most desired characteristics is a higher quality of life. Measuring quality of life allows us to determine a person's subjective appraisal of their health as well as the effects the illness and its treatment have on that person's daily activities. In patients recovering from CAB surgery, functional health status is typically assessed by looking at three domains of quality of life (QoL) that are connected to functional health status. (Schmidt-RioValle et al., 2020).

Nurses play a crucial role in patients undergoing cardiothoracic surgery by assisting in care coordination, providing emotional support at the time of diagnosis, providing information and assistance in decision-making, treatment, and continuous assessment and care before, during, and after CABG surgery. This helps to improve the patient's quality of

life and prevent post-operative complications. (Mohamed Elesawy et al.,2019).

A cardiothoracic surgery nurse needs to be fully capable of caring for patients since they need specialist and regular nursing care to improve their conditions and prevent or reduce potential postoperative complications. To achieve the highest levels of appropriate quality of life, nurses should create their standards of care (Farooq et al., 2022).

### Significance of the study:

From the clinical experience as a head nurse working in the cardiothoracic surgery department at Assiut University Heart Hospital, it has been observed that the number of patients undergoing coronary artery bypass grafts increased according to hospital records for the year 2019- 2020 the number of CABG patients was 214 (Assiut University Hospital Records, 2019).

From the researcher's experience and previous studies, patients with CABG have several problems in functional health status leading to clinical outcomes resulting in anxiety and fear of death and different complications such as major depression, frustration, and uncontrolled life issues. Therefore, this study was carried out to collect data that might help in assessing the functional health status of patients undergoing coronary artery bypass grafts.

### Aim of the study:

This study aimed to determine the functional health status of patients undergoing coronary artery bypass graft at Assiut University Heart Hospital.

### Research question:

What is the level of the functional health status of patients undergoing coronary artery bypass grafts?

### Patients and Method:

#### Research design:

A descriptive exploratory research design was utilized to carry out this study.

#### Setting:

This study was carried out in the cardiothoracic surgery department at Assiut University Heart Hospital.

The Assiut University Heart Hospital is the largest hospital in Upper Egypt that specializes in cardiovascular diseases and heart operations of all kinds. It is also the pioneer in offering prestigious and high-quality health services, employing top medical professionals with the most advanced degrees in diseases, heart operations, catheters, the range of surgical procedures, and the capacity to diagnose correct and appropriate medical intervention and improvement.

The cardiothoracic unit had 24 beds, 24 patients, and 3 sectors. It also provided care for the majority of the population in both urban and rural locations.

### Sample size:

The sample was 100 adult patients were selected by using the following equation according to Thompson (2012):

$$n = \frac{N \times p(1-p)}{\left[ \left[ N-1 \times \left( d^2 \div z^2 \right) \right] + p(1-p) \right]}$$

N=total patient population size of 214 who attended the cardiothoracic surgery department at Assiut Heart Hospital during the year 2019- 2020 for CABG.

Z = confidence levels are 0.95 and are equal to 1.96

D= the error ratio is = 0.05

P= the property availability ratio and neutral = 0.50

**Sample:** A purposive sample of 100 adult patients male and female, their ages ranging from 30-65 years, attended to cardiothoracic surgery department at Assiut University Heart Hospital for elective coronary artery bypass graft surgery. Excluded emergency cases, and not associated with other cardiac problems or valvular disease.

There were ten patients missed at follow up assessment due to post-operative complications and need readmission of intensive care unit, they include three patients suffering from bleeding needed exploration, four patients had severe pneumonia and needed mechanical ventilation, two patients had convulsion and one of them had sudden cardiac arrest.

### Tools of the study:

To collect relevant data for this study, two tools were used.

#### Tool (I): Patient assessment sheet:

This tool was developed by the researcher based on the national and international literature to assess socio-demographic and medical data for patients. It consisted of two parts:

#### Part 1: Patient personal data:

This part included socio-demographic data of studied patients such as age, gender, marital status, level of education, occupation, and living situation.

#### Part 2: Medical data: This part included:

**Past history** such as previous myocardial infarction, previous heart catheter stent, congestive heart failure, or angina.

**Current history:** Presence of diabetes, hyperlipidemia, hypertension, pulmonary problems, and smoking.

**Family history:** such as the presence of coronary heart diseases, cerebrovascular disease, hypertension, and Peripheral vascular disease.

**Tool (II): Biopsychosocial functional health status assessment sheet (Hlak and Jette 1989):**

Biopsychosocial functional health status is divided into three parts:

**Part (1): Physical health status:**

It included fourteen questions on the patient's physical health state, such as how well they could do activities of daily life or how limited they were.

**Part (2): Psychological health status:**

It included seven questions regarding several aspects of psychological health, including feelings of anxiety, frustration, and uncontrollable life difficulties.

**Part (3): Social health status:**

It included seven questions on social health status, including whether or not one could sustain relationships, visits, and social activities.

**Scoring system:**

**Scoring for part I (physical);** the total score was 84 and classified into; Scores less than 28 were considered dependent. Scores from 28 to less than 48 are partially dependent. Scores from 48 to 84 were considered independent.

**Scoring for part II (psychological);** the total score was 7 and classified into; Scores from 0 to less than 3 were considered mild psychological distress. Scores from 3 to less than 5 were considered moderate psychological distress. Scores from 5 to 7 were considered severe psychological distress.

**The scoring for part III (social);** total score was 7 and classified into; Scores from 0 to less than 3 were considered mild social dysfunction. Scores from three to less than five were considered moderate social dysfunction. Scores from five to seven were considered severe social dysfunction.

**Ethical approval:**

Permission to carry out the study was obtained from the ethical committee of the Faculty of Nursing at 25/11/2021 (session 35 No.333). Before each patient participated to the current study, verbal agreement was gained from them after the study's nature and objectives were explained. Anonymity and confidentiality are guaranteed. The researcher highlighted that the patients' involvement was voluntary and that they had the ability to resign from the study at any moment.

**Validity and reliability:**

- The tool's validity was assessed by a jury of five experts (medical-surgical nursing professionals) from Assiut University, who formed opinions on the tool's format arrangement, consistency, knowledge accuracy, relevance, and competence.
- The degree of reliability with which an instrument measures what it is intended to measure is referred to as the tool's reliability. According to the Alpha Cronbach's test, the tool's reliability was (0.75).

**Field of work:**

The study was carried out in the following steps:

- Written permission to conduct the study was obtained from the research committee in the faculty of Nursing, at Assiut University.
- An official permission letter was provided by the dean of the faculty of nursing to carry out the study.
- Official approval for data collection was obtained from administrators of the selected hospital.
- The research was conducted during morning and afternoon shifts.
- At the beginning of the interview, the researcher introduced herself to establish a line of contact.
- The patients' consent for voluntary participation was acquired, and the study's goal and nature were described.
- The researcher used textbooks, papers, and scientific periodicals to review the relevant local and worldwide literature for the current research.
- The researcher obtained baseline data from the patients by using Tool (I).
- The researchers meet with each patient individually and assess the patient's status; an informed consent was obtained for voluntary participation.
- Assessment of biopsychosocial functional health status using Tool (II). This was used for assessing (physical, psychological, and social health functions).
- This tool was filled by the researcher after asking the patients (through face-to-face interviews) in preoperative and postoperative surgery and during the follow-up period.
- The patients' data were treated with the utmost secrecy and anonymity.
- Data were collected during the period from 1/3/2022 to 30/11/2022.

**A pilot study:**

- A pilot study was carried out on 10 patients, or 10% of the sample, in order to assess the tool's applicability, viability, and clarity.
- This pilot study indicates that the required changes were made. The research sample did not include any of the patients who participate in the pilot study.

**Statistical analysis:**

Figures were produced in Excel and then entered into the statistical packages for the social sciences (SPSS) version 22.0 software for analysis. Each tool's material was examined, divided into groups, and finally coded by the researcher. Number and percentages were used to describe categorical variables whereas the mean and standard deviation were used to represent continuous variables (Mean, SD).

The health status function was constructed using chi-square test analysis and Pearson's formula was used to determine the statistical significance of differences across variables, with a p-value of 0.05 being regarded as significant. A post hoc power calculation determined that the study had a power of 90% using a reference compliance rate of 38%, 5% variability, and 5% alpha value.

## Results:

**Table (1): Distribution of demographic characteristics for the studied patients (n=100)**

Demographic characteristics	N	%
<b>Age</b>		
30-39yrs	3	3.0
40-65yrs	97	97.0
Mean $\pm$ SD	47.55 $\pm$ 5.51	
<b>Gender</b>		
Male	84	84.0
Female	16	16.0
<b>Marital status</b>		
Single	3	3.0
Married	97	97.0
<b>Educational level</b>		
Illiterate	1	1.0
Read and write	8	8.0
Primary school	5	5.0
Secondary school	56	56.0
High education	30	30.0
<b>Occupation</b>		
Employee	60	60.0
Un employee	17	17.0
Workers	8	8.0
Other	15	15.0
<b>Living situation</b>		
Live alone	3	3.0
Live with others	97	97.0

**Table (2): Distribution of medical data for studied patients (n=100)**

Medical data	Yes		No	
	N	%	N	%
<b>Past history</b>				
- Previous myocardial infarction	13	13.0	87	87.0
- Previous heart catheter stent.	35	35.0	65	65.0
- Congestive heart failure.	10	10.0	90	90.0
- Angina	97	97.0	3	3.0
<b>Current History</b>				
- Diabetes mellitus.	64	64.0	36	36.0
- Hyperlipidemia.	1	1.0	99	99.0
- Pulmonary problems.	3	3.0	97	97.0
- Smoking.	60	60.0	40	40.0
- Hypertension	84	84.0	16	16.0
<b>Family history</b>				
- Coronary heart diseases	1	1.0	99	99.0
- Cerebrovascular disease.	2	2.0	98	98.0
- Peripheral vascular disease	0	0.0	100	100.0

**Table (3): Comparison between pre, postoperative, and follow-up phases about the total score of physical function assessment (n=100)**

Physical function assessment	Pre (N & %)	Post (N & %)	Follow up (N & %)	P. value
Dependent	11 (11%)	2 (2.0%)	4 (4.0%)	0.001**
Partial dependent	68 (68%)	66 (66.0%)	36 (36.4)	
Independent	21 (21.0%)	32 (32.0%)	60 (60%)	

Pearson Chi-Square test

\*\* (High statistical significant differences P value <0.001)

not significant =  $\geq 0.05$

significant  $\leq 0.05$

high significant P value <0.001

**Table (4): Comparison between pre, postoperative, and follow-up phases about the total score of psychological function assessment (n=100)**

Psychological function assessment	Pre	post	Follow up	P. value
Moderate psychological distress	51(51.0%)	81 (81.0%)	93 (93.0%)	0.001**
Mild psychological distress	49(49.0)	19(19.0)	7(7.0%)	
Severe psychological distress	0 (0%)	0(0%)	0(0%)	

Pearson Chi-Square test

\*\* (High statistical significant differences P value <0.001)

not significant =  $\geq 0.05$

significant  $\leq 0.05$

high significant P value <0.001

**Table (5): Comparison between pre, postoperative, and follow-up phases of total score social function assessment (n=100)**

Social function assessment	pre	post	Follow up	P. value
Mild social dysfunction	28 (28.0)	61 (61%)	97 (97%)	0.001**
Moderate social dysfunction	57 (57.0)	31 (31.0%)	2 (2.0%)	
Severe social dysfunction	15 (15.0%)	8 (8.0%)	1 (1.0%)	

Pearson Chi-Square test

\*\* (High statistical significant differences P value <0.001)

not significant =  $\geq 0.05$

significant  $\leq 0.05$

high significant P value <0.001

**Table (6): Comparison between pre, and post-operative phases and follow-up about the total score of biopsychosocial function assessment (n=100)**

Biopsychosocial function assessment		Mean	Std. Deviation	F	P. value.
Psychological	Pre	3.3900	.80271	53.84	0.001**
	Post	2.6200	1.07101		
	Follow up	1.9278	1.07284		
Social	Pre	4.0300	1.89340	83.51	
	Post	2.7500	1.99178		
	Follow up	.9175	1.01725		
Physical	pre	55.8200	11.00173	91.92	
	post	62.3600	8.94373		
	Follow up	39.1818	16.22505		

\*\* (High statistical significant differences P value <0.001)

One -way anova test

not significant =  $\geq 0.05$

significant  $\leq 0.05$

high significant P value <0.001

**Table 7: Correlation between physical, psychological, and social function assessment during preoperative, postoperative, and follow up phase**

Biopsychosocial function	Case follow up	Physical function		Psychological function	
		R	p	R	p
Psychological function	Pre	0.067	.510	-----	-----
	Post	-.164	.102	-----	-----
	Follow up	.350**	.001	-----	-----
Social function	Pre	.070	.491	.411**	.001
	Post	.045	.656	.310**	.002
	Follow up	.212*	.037	.453**	.001

\*\* (High statistical significant differences P value <0.001)

not significant =  $\geq 0.05$

significant  $\leq 0.05$

high significant P value <0.001

**Table (8): Correlation between biopsychosocial function assessment and personal data**

Biopsychosocial function		Gender	Age	Marital status	Education level	Occupation	Living situation
Physical function	Pearson Correlation	.030	-.016	.008	-.050	.080	-.034
	Sig. (2-tailed)	.607	.784	.885	.384	.165	.562
Psychological function	Pearson Correlation	-.046	.009	.152**	.041	-.149*	.083
	Sig. (2-tailed)	.430	.882	.009	.484	.010	.152
Social function	Pearson Correlation	.078	-.046	.104	-.043	.043	.114
	Sig. (2-tailed)	.178	.433	.072	.461	.463	.050

\*\* (High statistical significant differences P value <0.001)  
 not significant = ≥ 0.05      significant ≤ 0.05      high significant P value <0.001

**Table (9): Correlation between biopsychosocial function assessment and medical data**

Biopsychosocial function		Previous myocardial infarction	Heart catheter stent	Congestive heart failure	Angina	Diabetes	Smoking	Hypertension
Physical function	Pearson Correlation	-.026	.175**	-.016	-.013	.040	.058	.031
	Sig. (2-tailed)	.659	.002	.784	.818	.495	.316	.593
Psychological function	Pearson Correlation	.087	-.107	.035	-.040	-.178**	.101	.041
	Sig. (2-tailed)	.136	.066	.550	.492	.002	.081	.486
Social function	Pearson Correlation	.070	-.076	-.024	.034	-.008	-.005	.023
	Sig. (2-tailed)	.231	.193	.680	.562	.895	.933	.699

\*\* (High statistical significant differences P value <0.001)  
 not significant = ≥ 0.05      significant ≤ 0.05      high significant P value <0.001

**Table (1):** Shows that the highest percentage of studied patients ages ranged between 40-65 years, male, and married. Regarding the level of education, occupation, and living situation, the majority of studied patients were secondary education, employees, and living with others.

**Table (2):** Shows that the highest percentage of studied patients had angina, diabetes, and hypertension.

**Table (3):** Revealed that the majority of the studied patients had a partially dependent physical function in the preoperative and postoperative phases while follow-up was independent. There was a highly statistically significant difference at p. value <0.001.

**Table (4):** Revealed that the majority of the studied patients had moderate psychological distress in the preoperative, postoperative, and follow-up phases. There was a highly statistically significant difference at p. value <0.001.

**Table (5):** Revealed that the majority of the studied patients had moderate social dysfunction in preoperative while they had mild social dysfunction in post-operative and follow-up phases. There was a highly statistically significant difference at p. value <0.001.

**Table (6):** illustrates that there was a highly statistically significant difference between the preoperative, postoperative phase, and follow-up regarding biopsychosocial function (physical, psychological and social function) at p. value <0.001.

**Table (7):** Illustrates that there was no correlation between physical, psychological, and social function during the preoperative and postoperative phase of CABG surgery but a positive correlation was revealed in the follow-up P value < 0.001.

**Table (8):** Illustrates that there was a statistically significant difference between gender, marital status of the studied patient, and physical function, and also, a statistically significantly different between age, marital status, and psychological function.

**Table (9):** Clarifies that there was no statistically significantly different between biopsychosocial function and medical data except between physical function and heart catheter stent there was highly significant at P. value = (0.002). Also, there was a statistical significance difference between psychological function among patient participants and diabetes.

**Discussion:**

Coronary artery bypass grafting (CABG) is a crucial surgical operation for patients with coronary artery disease that enhances symptoms, survival, and quality of life. (Bell et al., 2019). The assessment of a patient's functional health status is done to see whether there has been an improvement in their cardiac activity, which is represented in their daily activities. (Schmidt-RioValle et al., 2020)

**Regarding the Sociodemographic data**, the highest percentage of studied patients ages ranged between forty to sixty-five years old. The researcher's opinion is this group of age may be due to the aging process and disease prognoses. These findings matched with **Batra et al., (2019)** who reported that the main age of patients undergoing CABG was more than forty years old. **Tchkonja & Kirkland, (2018)** concluded that aging could increase the risk for chronic diseases and disabilities. **Holmberg et al., (2019)** found that almost half of the study subjects were above forty years old. On the other hand, **Ram et al., (2020)** study reported that people with atherosclerotic diseases are at younger ages. **Santarpino et al., (2019)** found that atherosclerotic diseases affect patients forty years and older population but younger males and females can also be affected.

Regarding gender, the highest percentages of studied patients were male. This result was consistent with **Venkatesh et al., (2018)** who reported that in autopsy studies of individuals in their twenties, coronary atherosclerosis was found, and according to certain research, approximately nineteen percent of males in their early thirties have advanced coronary artery atherosclerosis. This result was opposite to the study by **Ferreira, et al., (2018)** who found that the female sex is at higher risk of CABG, that females are more risk for CAD, especially with advanced age.

High rates of smoking were found in the patient populations in the studies evaluating the outcomes of younger patients having CABG procedures (**Pačarić et al., 2020**). According to the study, smoking was more prevalent among men than women in our patient population, where the smoking prevalence was 60%.

The current study's findings regarding marital status showed that the majority of patients were married. These results are consistent with **Hindle (2017)** study, "Early Post-Operative **Psychosocial** and Weight Predictors of Later Outcome in Cardiac Surgery: A Systematic Literature Review," which noted that the majority of the study's participants were married. According to the researcher's opinion, this may be because the majority of the study participants were of marriage age and subjected to the stress of daily life. The majority of patients in the study live with their families, and the researcher's perspective is that patients are questioned about whether they have

difficulties conducting activities of daily living (ADLs).

As regards the level of education, more than half of the studied patients were having secondary education. Contrary, **Szygula-Jurkiewicz et al., (2019)** discovered that nearly half of the study's subjects were illiterates. Low socioeconomic levels among the patients that visited the Assiut University Hospital's cardiothoracic department may be responsible for this.

According to occupation, the present study revealed that the **majority** of studied patients were employed. Regarding **Yerokun et al., (2019)** study, they recommended that after around six weeks, the patient should be able to resume the majority of activities, including working, driving, and engaging in sexual activity. The patient might need to take more time off work if they perform strenuous physical activities.

This finding contrasts with a study by Takousi, et al. (2018) titled "Health-related quality of life after coronary **revascularization**," in which the researchers found that more than half of the patients were pensioners. This finding may be explained by the fact that the majority of the patients had high or moderate levels of education and worked to improve their living conditions.

**Regarding medical data**, the findings of this study's data collection revealed that the majority of the patients it researched suffered from angina. It also revealed that most of the patients it studied did not have a family history of hypertension, diabetes, or smoking.

**Whelton et al., (2020)** matched with the present study and found that patients undergoing CABAG frequently have many CAD-related risk factors. According to the findings of certain research, the majority of the patients had one or more atherosclerosis risk factors. **Agrawal et al., (2020)** reported that people with CAD are more likely to have a sedentary lifestyle, consume large amounts of fatty meals, and smoke cigarettes. Also, **Betageri et al., (2021)** reported that adult patients may develop coronary atherosclerosis and CABAG due to smoking, hypercholesterolemia, diabetes mellitus, hypertension, obesity, and other risk factors including oral contraceptives in young females, and cocaine addiction.

**Regarding physical functional status**, The present study found that the majority of the studied patients had a partially dependent physical function in the pre and post-operative phase while follow-up was independent. From the researcher's point of view and her experience this advanced improvement was due to the gradual early ambulation after surgery. **Subih et al., (2018)** found that performance capacity and physical activity deteriorate in the functional state,

particularly physical condition, of the patient, immediately following CABAG. This match with **Ohbe et al., (2021)** who revealed that patients undergoing CABG are assessed whether they have any physical difficulty and any obstacles when performing activities of daily living (ADLs). On the other hand, **Sajobi et al., (2018)** mentioned the fact that patients who have CABG have very poor long-term health-related quality of life making it vital to continue with daily activities while being hospitalized. Therefore, **Barrie et al., (2019)** recommended that to maintain ADLs and independence for these individuals, early rehabilitation, mobilization, or active exercise programs are increasingly being offered.

These results were consistent with the view of **Lie et al., (2019)** in their study, which was titled "Patients' experiences with symptoms and need in the early rehabilitation phase after coronary artery bypass grafting," researchers discovered that the patients had low physical performance scores, slow walking speeds, and higher levels of disability in ADLs that required more effort. The fact that the current trial was conducted a month after CABG, when CABG-related side effects including pain and exhaustion had subsided, may be to blame for this result.

In this respect, **Gierlaszyńska et al., (2018)** reported that due to their low cardiac function, ischemia risk, and surgical invasiveness, patients who undergo CABG are more prone to experience physical limitations. As a result, cardiac rehabilitation with patients after CABG has been commonly performed. A previous study by **Smith et al., (2021)** showed that cardiac rehabilitation demonstrated beneficial effects on physical function. **Shah & Chandra, (2022)** also revealed that patients who underwent CABG had several constricted or blocked coronary arteries, experienced significant surgical stress, required longer periods of immobilization, and needed longer recovery times.

These results were contradicted by the view of **Smith, (2021)** who performed a study titled by "Effect of cardiorespiratory fitness on short-term morbidity and mortality after coronary artery bypass grafting", found that about two-thirds of CABG patients mentioned they felt fatigued when using the stairs. This outcome might be a result of the post-operative felt fatigue being more severe, which affected functional fitness, energy expenditure, and levels of physical activity (PA).

**As regards psychological functional status:** The current study revealed that the majority of the studied patients had moderate psychological distress. According to **Açikel, (2019)** who indicated that between one-third to one-half of all patients who undergo coronary artery bypass graft (CABG),

surgery will experience depression, including major, mild, and dysthymia.

Psychosocial factors have long been associated with an elevated risk of morbidity, both in the short and long terms, according to empirical research on CABG surgery patients. Recently, **Noor-Hanita et al., (2022)** suggested that, despite the fact that the behavioural and biological mechanisms are poorly understood, it has been claimed that both depression and anxiety raise the risk of death and morbidity after CABG surgery independently of medical variables. In this respect, **Aburuz, (2019)** reported that Patients with CABG experience significant psychosocial burden, which is mostly attributable to the limitations placed on them and is complicated by the somatic symptoms experienced by CAD patients and the additional stress from surgery.

Additionally, **Ivankovic et al., (2022)** found that self-reported anxiety estimations vary as well. For CABG patients, anxiety is especially acute while they are waiting for surgery and don't know when it will happen. It has been noted that a common fear of dying before surgery rather than during it.

Additionally, anxiety might worsen CAD symptoms because it is an autonomic symptom (**Derrick et al., 2019**). According to Derrick et al research's while anxiety may reduce to pre-operative levels following surgery, its severity may still remain above subclinical levels and necessitate management.

Additionally, there is evidence for non-fatal morbidity consequences, where depression symptoms are linked to an increased risk of cardiac operations, unexpected hospital readmissions, and a lower quality of life (**Hojskov et al., 2019**). **Aburuz et al., (2022)** reported at a six-month follow-up, more than half of patients experienced hospital readmissions due to depressed symptoms related to surgery, CAD, and wound infection.

**Regarding Social functional status:** The present study found that the majority of the studied patients had moderate social dysfunction and then at the follow-up to mild social dysfunction.

The same results were supported by **Chindhy et al., (2020)** who reported that cardiovascular disease also causes psychosocial problems in patients, and it was also noted that recovery remained difficult for many CABG patients because psychosocial issues were proven to be more powerful predictors of recovery than physical issues after myocardial infarction. A study done by **Steffen et al., (2022)** found that marital flexibility and broader social network support promote psychosocial recovery after CABG surgery.

Due to the low literacy level, the researcher believes that social support is one of the most efficient strategies to promote long-term treatment success and patients' adjustment to disease.



Support is a critical factor in recovery. **Scheier & Carver, (2018)** found that patients acknowledged that without their family's support with housework, grocery shopping, and transportation to appointments, they would not be able to heal. Although the majority of patients would recover with a fair amount of composure, at least 25% of patients have substantial long-term issues with social recovery (**Tigges-Limmer et al., 2021**).

**Singh Solorzano et al., (2021)** found that despite being physically fit, patients frequently fail to resume their old jobs, hobbies, and sexual activities. In addition, **Kim et al., (2022)** reported that patients with poor psychosocial rehabilitation frequently experience social isolation, poor adherence to diet and exercise regimes, and have too pessimistic views of their health.

The present study illustrates that there was no correlation between physical, psychological, and social function during the preoperative and postoperative phases of CABG surgery but there was a positive correlation in the follow-up phase.

The researcher found that there was a significant improvement in all domains of quality of life. **Pačarić et al., (2020)** found patients' functional status after CABG is not improved in all domains, and some patients even experience poorer functional status after the surgery. In this line, **Peeler et al., (2022)** study differences in the quality of life between pre and post-surgical treatment of cardiac surgery involving a comparison of preoperative status and postoperative. Following CABG, patients frequently experience pain, discomfort, depressive symptoms, impatience, a loss of overall well-being, and an inability to perform their pre-surgery activities. The patient's functioning condition may be substantially hampered by these emotions (**Bishawi, et al., 2018**).

These results were consistent with the view of **Viamonte et al., (2023)** study titled "Impact of a comprehensive cardiac rehabilitation framework among high cardiovascular risk cancer survivors ", who found that some patients experience an improvement in physical functioning after CABG; this outcome may be attributable to cardiac rehabilitation programs that are started soon after discharge and increase exercise tolerance and muscular strength.

Additionally, **Makita et al., (2022)** revealed that about half of the patients were unmotivated to interact with others, lacked confidence, and felt guilty about asking for help.. This study is contrary to the study by **Dias et al., (2021)** who mentioned that patients having coronary artery bypass grafts were observed one week and one-month following hospital release; researchers discovered that these patients lacked the awareness of how many changes they had made to

their lifestyle and health habits as well as a lack of ability to handle stressful situations. This outcome can be the result of the Egyptian healthcare system's inability to recognize the number of lifestyle and health changes that people need to make since formal discharge planning and also, patient education is not practiced.

The current study found that there was a statistically significant difference between gender, marital status of the studied patient, and physical function, but; there was a statistically significant difference between age, marital status, and psychological function. **Safdar & Mangi, (2020)** showed that patients receiving CABG had a cumulative prevalence of delayed functional status that increased with age and was higher in women than in men. This result disagreed with a study by **Barnason, et al., (2020)** titled "Functional status outcomes of patients with a coronary artery bypass graft throughout time," which revealed a connection between the study subjects' ages and their social demands.

This result may be the consequence of the patient feeling self-conscious about his condition at this age and feeling separated from people his own age as a result of his lack of confidence owing to his disease and physical status, and he refuses to adapt to the changes after surgery.

Concerning relations between gender and biopsychosocial needs of patients post-CABG, **Bute et al., (2003)** found males are significantly higher than females and the difference between males and females regarding their biopsychosocial are statistically non-significant.

**Sumin, et al., (2022)** found no relationship between age and functional status. In the same line, **Nguyen et al., (2022)** found that the incidences of death, perioperative myocardial infarction, and cerebrovascular accident/transient ischemic attack following coronary artery bypass grafting in men and women were not statistically significant after correcting for variations in their risk variables. According to the researchers, female gender is not a role in perioperative problems; rather, comorbid risk factors are.

**Rodrigues et al., (2022)** stressed on older patients undergoing CABG surgery endure a significant amount of stress associated to cardiopulmonary bypass as well as surgical stress. Also, **Akhlaghi et al., (2020)** found that cardiopulmonary bypass surgery triggers the stress response by activating cytokines, although it is unclear exactly how this affects post-operative and post-discharge catabolism, hypermetabolism, nutritional status, and the outcomes for physical health. **Abdullahi et al., (2022)** found that in addition to experiencing discomfort, tension,

and sleep difficulties, two-thirds of the study participants had no significant role in their lives.

The present study represents that there was a statistically significant difference between the psychological function of participants and diabetes. Also, there was no statistically significant difference between the physical function or social function of patient participants with diabetes or smoking and hypertension. This result agreed with **Hornik & Dulawa, (2019)** who reported that diabetic patients had a substantially higher probability of being unable to perform their activities independently, which had an adverse psychological impact. This matched with **Gold et al., (2020)** who found that smoking, diabetes mellitus, and functional health impairment all showed a significant statistical difference.

The present study clarifies that there was no significance between biopsychosocial function and medical data except between physical function and heart catheter stent. This matched with **Zhang, & Wei, (2021)** who found a positive correlation between physical function and heart catheter stent.

### Conclusion:

In the light of our study findings it was included that the highest percentage of the of the studied patients had a partially dependent physical function in the preoperative and postoperative phases while in follow –up was independent, regarding to the majority of the studied patients had moderate psychological distress in the preoperative, postoperative and follow up phases, regarding to the majority of the studied patients had moderate social dysfunction in preoperative while they had mild social dysfunction in post-operative and follow up phases and a highly statistically significant difference between the preoperative, postoperative phase, follow-up regarding biopsychosocial function in three domains (physical, psychological and social function)and Functional health status was improved after (CABG) surgery in the follow-up phase, particularly in physical function.

### Recommendations:

Establishing a simplified and illustrated educational booklet regarding therapeutic compliance and discharge instructions to improve functional health status for patients undergoing coronary artery bypass graft

- Discharge plan on patient's outcomes post coronary artery bypass graft Surgery.
- Referral of patients with poor functional health status to a professional for further assessment and treatment.

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