Relationship between Symptom Burden Clusters and Quality of Life in Patients with Coronary Artery Bypass Grafting Surgeries

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Abstract

Background: Throughout the first three months following discharge from the hospital, patients who have undergone coronary artery bypass graft surgery (CABG) frequently have a wide range of symptoms, which affect the quality of life (QOL) by adding extra burdens to their health. **The study aimed** to determine the relationship between symptom burden clusters and the quality of life in patients with coronary artery bypass graft surgery. **Research design:** A descriptive correlational design was utilized in this study. **Setting and sampling** A purposive sample of 85 post-CABG surgery patients was investigated at the cardiac outpatient clinic affiliated with Suez Canal University Hospitals. **Tools: Tool I:** A structured interview questionnaire, **Tool II**: The cardiac symptom survey (CSS) to measure the burden of symptoms for patients who have undergone CABG surgery, **Tool III:** The World Health Organization Quality of Life questionnaire (WHOQOL-BREF), which measures patients' quality of life. **Results:** The study found that low-moderate symptom burden affected 35.3% of the patients, moderate symptom burden involved 47.05%, and low symptom burden affected 17.65%. The mean score for physical health was the greatest at 62.04±11.65, followed by perceptual health at 60.24±7.93, economic health at 59.886.81, social health at 57.61±7.62, and emotional health at 55.63±7.89. **Conclusion**: There is a statistically significant relationship between total symptom burden and physical, social, and emotional health, and this relationship increases with every unit increase in the symptom burden score. **Recommendations**: Conduct research to assess how a self-care program affects patients with CABGs' symptom burden and quality of life.

Keywords: Symptom Burden, Clusters, Quality of Life, Coronary Artery Bypass Grafting

Introduction:

Coronary artery disease (CAD) is a heart condition that are characterized by an abnormal structure or function of the coronary artery due to atherosclerotic disease **(Zhang et al., 2020).** The disease is characterized by atherosclerosis in the pericardial coronary arteries, which can narrow or block coronary arteries and reduce blood flow and oxygen to the heart muscles **(Ajtahed et al., 2019).**

The coronary artery bypass graft surgery (CABG) restores blood flow to the heart muscles by crossing around narrowed portions of the coronary artery using the patient's own veins or arteries as a graft. The most frequently used sites to pick-up the graft from are the chest or arm veins. Therefore; bypass surgery significantly reduces or completely eliminates chest pain for the vast majority of patients. Furthermore, it can lengthen life for people with severe coronary heart disease **(Bundhun et al., 2016).**

Pain, discomfort, depressive thoughts, impatience, a general loss of well-being, and the inability to perform at the same level as before the treatment are among the symptoms that patients frequently mention. The general health and quality of life of the patient may be significantly harmed by these emotions, according to **Paari et al. (2020).**

Following coronary artery bypass graft surgery, there are a number of potential issues, but they are uncommon. Aortic dissection, thrombocytopenia, bleeding, stroke, wound infection, renal failure, cognitive abnormalities, pulmonary problems, pleural effusion, phrenic nerve injury, intercostal nerve damage, heart attack, arrhythmia, and mortality are some of the most serious effects. Complications may result from the body's response to the cardiopulmonary bypass machine's artificial blood circulation and gas exchange **(Doenst et al., 2019).**

A patient's overall, mental, and social well-being, as well as their impression of their degree of general well-being, can all be impacted by the chronic condition known as CAD. Efficiency and quality of life (QOL) are emphasized in advanced CAD treatments. Most CAD patients worry about how their symptoms and physical capabilities may degrade over time, as well as how their social obligations will change. Patients often experience a range of problems, including musculoskeletal dysfunction, sleep problems, poor energy, and emotion dysregulation, according to **Martnez-González et al. (2017).**

Quality of life (QOL), which encompasses both the good and bad aspects of life, refers to the overall wellbeing of individuals and society. It consists of what an individual or society considers to be a good existence. The person's ideas, goals, and sociocultural environment all have an impact on these expectations. It serves as a standard by which a person or community can assess the various aspects of their lives. The extent to which one's own life meets with a desired standard level is defined as life satisfaction, or the degree to which these areas provide satisfaction and, as a result, contribute to one's subjective well-being **(Kotajärvi et al., 2022).**

The idea of quality of life is the ability to function successfully every day and to feel comfortable engaging in daily activities. Along with having enough sleep and rest, maintaining these daily routines involves physical mobility, independence from others, sufficient energy for self-help, social interactions, emotional stability, and the absence of pain or other discomfort-related symptoms **(Soleimani et al., 2022).** For patients who have undergone surgery or who have heart disease, quality of life (QoL) is one of the most important outcomes in healthcare **(Kotajärvi et al., 2022).**

The burden of CABG symptoms needs to be assessed immediately and continuously by nurses to prevent further complications. The nurse should motivate the patient to actively engage in all aspects of life gradually according to the patients' capabilities and general health status in order to enhance their quality of life. This can assist patients and their families in managing functional impairment brought on by disease as well as maintaining and improving their health condition **(Harris et al., 2020).** Previous studies demonstrated that patients with cardiac issues and surgeries had poorer QOL than the general population **(Soleimani et al., 2022).**

Significance of the study:

Health organizations have emphasized the necessity of assessing the burden of symptoms and their impact on quality of life in order to improve the patients' care in light of the increasing worldwide burden of coronary artery diseases. According to the latest World Health Organization (WHO) data published in 2020, the Coronary Heart Disease (CHD) Deaths in Egypt reached 173,871 represented 32.40% of total deaths. The age adjusted death rate is 268.11 per 100,000 of population, that ranks Egypt in the15th level around the world **(WHO, 2020)**. However, little is known about the burden of symptoms and how it affects CABG patients' quality of life **(Reda et al., 2019).**

Patients may experience different levels of QOL depending on the severity of their diseases, their demographics, and their medical history. Complications, cardiac mortality, and rehospitalization rates all rise in patients with heart disease who have low QOL. There is general agreement that quality of life (QOL), particularly in individuals with certain disorders, is a subjective and multifaceted impression including physical, functional, social, emotional, and mental domains **(Ghasemi et al., 2014).**

Aim of the study

The study aimed to determine the relationship between symptom burden clusters and quality of life in patients with coronary artery bypass graft (CABG) surgeries.

Objectives

- Assess symptom burden clusters in patients with coronary artery bypass graft surgeries.
- Assess quality of life in patients with coronary artery bypass graft surgeries.
- Explore the relationship between symptom burden clusters and quality of life in

patients with coronary artery bypass graft surgeries.

Research questions:

1. Do patients with coronary artery bypass graft surgeries had a symptom burden clusters?
2. Do coronary artery bypass graft surgeries affect the patients' quality of life?
3. Is there a relationship between symptom burden clusters and quality of life in patients with coronary artery bypass graft surgeries?

Operational definitions

***Symptom burden*:** Means the load or weight that symptoms add on the patients' health domains

Clusters: Means groups that starts from two until ten.

Research design

A descriptive correlational study design was used to conduct the study as it describes the variables and the relationships that occur naturally among the variables.

Setting:

This study was carried out at the cardiac outpatient clinic in Suez Canal University Hospitals.

Subjects:

This study included a purposive sample of (85) post-CABG surgery patients who were in the study setting at the time of data collection within six weeks after the CABG surgery.

Sample and sampling technique:

To show a correlation coefficient of at least 0.3 between the scores for symptoms burden and QoL, the sample size was computed with a 95% power and 80% level of confidence. calculating the sample size for correlation using the Open-Epi software **(OpenEpi Menu. No date).** With a 5% dropout rate and the required sample size of 84 participants, a total of 90 participants were enrolled. Based on the estimated 170 cases of this type of operation in Suez Canal university hospitals by the year 2020, the sample was equalized based on the total number of patients (population size). According to the following equation, the sample was calculated by the program: **n = [DEFF*Np(1-p)] / [(d2/Z2 1-α/2*(N-1) +p*(1-p)].**

The sample was involved in the study under some inclusion criteria, including adult patients of both sexes who had undergone CABG surgery within the previous six weeks and were able to communicate. But, patients with diabetes mellitus, renal impairment, liver cirrhosis, and cancer were excluded from the study because these conditions have been linked to higher mortality rates, complications, and bleeding events in atherosclerotic coronary heart disease, which have been shown to affect study results (**Järvinen et al., 2019; Huo et al., 2021).**

Objectives

- Assess symptoms burden clusters in patients with coronary artery bypass graft surgeries.
- Assess quality of life in patients with coronary artery bypass graft surgeries.
- Identify the relationship between symptom burden clusters and quality of life in patients with coronary artery bypass graft surgeries.

Data collection tools:

Data for this study was collected using three tools that included:

Tool I: A structured interview questionnaire that was designed by the researchers and consisted of two parts.

Part I: Personal characteristics: This part included eleven items to assess patients' data, which included patients' code number, age, gender, educational level, occupation, work nature, marital status, residence, the residence from follow-up, family income, and treatment expense.

Part II: Clinical characteristics: It was designed by the researchers in simple Arabic language with reference to **(Tsai et al., 2019; O'Malley, 2021).** The tool included nine questions to assess the present and history of the patient and to identify the length of the Intensive Care Unit (ICU) stay in days, duration of disease, suffering from side effects of medications, levels and types of side effects of medications, history of tobacco use, the practice of regular exercises, in addition to the family history of CADs, previous heart surgeries. The tool with its two parts took around 20 minutes to be completed.

Tool II: The cardiac symptom survey (CSS): It concerned with the assessment of symptom burdens for patients with CABG surgeries and was adopted from **(Abbott et al., 2010; Tsai et al., 2019)**. The CSS is a 10-item scale based on the symptom management model and is used to assess patients' perceptions, evaluations (burden), and responses to 10 symptoms commonly experienced post-CABG. Patients rate their perception of having one of 10 symptoms (angina, shortness of breath, fatigue, depression, trouble sleeping, pain from surgery, swollen legs, palpitation, anxiety, and poor appetite). The tool took about 5 minutes to be completed.

Scoring system

The frequency and severity of symptoms (ranging from 0 which means no symptoms to 10 which means most severe and intense symptom frequency and severity) were determined with a mean timing and intensity score computed for each symptom before discharge. The evaluation of symptoms was estimated by calculating a mean score of the frequency and severity ratings.

Scores are made for each domain and scaled from 0 to 100, with 0 representing the worst possible health status and 100 the best possible health status. By sorting the symptom severities into categories: The low category contains (0–2) symptom, and moderate category contain (>2) symptom. So, one symptom could construct the profile of each symptom cluster. Cluster 1, was identified as low symptom burden of the all assessed 10 symptoms; Cluster 2, occurred by a combination of more than one low symptom burden categories that include (shortness of breath, fatigue, depression, incision pain, anxiety), and moderate symptom burden categories that include (sleep problems, lower extremity edema, and appetite problems); and Cluster 3: that include moderate symptom burden of all assessed 10 symptoms.

Tool III: World Health Organization Quality of Life questionnaire (WHOQOL-BREF). The questionnaire is a short version of the widely used QOL assessment instrument, which was adopted by **Gholami et al. (2016).** It included five domains to assess the physical health, psychological health, social relationships, the cognitive health, and economic health. The most of the questionnaire has been filled out by the researchers. It has high validity and reliability as reported by **Skevington et al. (2004)**. The tool took from 15 to 20 minutes to complete.

The first domain assessed six items related to the physical health including activities of daily living, dependence on medicinal substances, energy and fatigue, mobility, pain, sleep and rest, in addition to work capacity. The second domain assessed six psychological health items including body image; negative and positive feelings; self-esteem; spirituality; religion; personal beliefs; and learning.

The third domain consisted of three social health items including personal relationships, social support, and sexual activity. The fourth domain consisted of eight items to assess the environmental health including financial resources, freedom, physical safety, and security. The fifth domain assessed the social health care such as accessibility and quality of care, home environment, opportunities for acquiring new information and skills, recreation and leisure activities, physical environment, and transport. Separately examined two items assessing the individual's overall perception of quality of life; and the individual's overall perception of their health.

Scoring system:

The pre-coded numeric values were recoded per scale from 0 to 100; zero corresponds to the worst health status and 100 to the best. Scores represent the percentage of the total possible score achieved in which questions with 5 response options were coded as 0, 25, 50, 75, and 100. Domains' scores are scaled in a positive direction, as higher scores denote a higher quality of life. The domain score was measured by the mean score of items within each domain. Mean scores are then multiplied by 4 to make score of 100.

Ethical considerations

Before data collection, the study protocol was approved by the Research Ethics Committee of the Faculty of Nursing/ Suez Canal University with the number of (---). The researchers were to meet individually with each eligible patient, explain the aim of the study, and obtain verbal

consent from participants. The participants were told that they could refuse or withdraw from the study at any time. Anonymity and confidentiality were secured for all participants. All information was used only for research purposes.

Validity and reliability of the tools:

Tool I of the study was developed by the researchers after reviewing recent related literatures; but tool II and Tool III were adopted from internationally validated tools. The scales were translated through the process of back-to-back translation. The content validity of the developed tools was tested for clarity and applicability by seven experts in medical-surgical and critical care nursing, in addition to two experts in cardiology surgery and Biostatistics to ensure their validity and modifications were done.

The reliability of the used tools was evaluated by assessing their internal consistency. The Arabic version of WHOQOL-BREF was tested for reliability using Cronbach's Alpha test = 0.916, which indicates that the Arabic version demonstrated excellent scale reliability. The internal consistency for the cardiac symptom survey (CSS) scale was determined at (0.85 to 0.98) for the Arabic version, which means excellent reliability using Cronbach's Alpha test.

Pilot study

A pilot study was carried out on nine patients (10%) of the calculated sample size to test the clarity, applicability, and feasibility of the tool and to estimate the time needed to fill it. Necessary modifications were made according to pilot results. The pilot sample was excluded from the total sample as some modifications were made.

Field Work

Preparatory phase

In this phase, the researchers reviewed pertinent literatures of the current and past evidences related to various aspects of the disease using textbooks and scientific journals, in addition to internet periodicals and magazines. The researchers worked on the data collection tools, which were translated into simple Arabic language, and once the tools were ready, they were reviewed for validity and reliability, then piloted.

Implementation phase:

The data were collected through six months, that started from January 2022 until June 2022. The researchers followed some steps to collect data, that included obtaining permission from the hospital manager and the head of the outpatient department. The aim and objectives of the study were explained to all nurses either supervisors or staff nurses to obtain their assistance and facilitate data collection.

The researchers met patients and explained the aim of the study, and obtained verbal consent from them to participate in the study. The researchers were available three days a week to collect data between 9.00 am to 2.00 pm from the previously listed sittings. Each patient was interviewed individually for 40–50 minutes to complete the questionnaire. The researchers interviewed with patients at the waiting area of the cardiac outpatient affiliated to Suez Canal University Hospitals.

Statistical Design

Santoso et al. (2016) used the Statistical Package for the Social Sciences (SPSS) version 23 to code, enter, and analyze the data collected. An ANOVA test was used for the difference between the means of groups of more than two. Correlations were used to test relationships between different variables. Linear regression was used to predict QOL from symptom burden. The proportion probability of error (P-value) was set at <0.05 for significant results. When $P < 0.01$, there is a highly statistically significant difference. X was used to calculate the mean score degree for the symptoms burden clusters, total QOL, and QOL mean scores according to the total level of symptoms burden. Moreover, percentage was used for descriptive data.

Results:

Table 1 represented the percentage distribution of the studied patients according to their personal characteristics. It showed that 67.1% of the patients were between the ages of 50 and 60, 68.2% were male, and 87.1% were married. Also, 62.4 % of the patients were rural

residents, and 8.4% resided far from the follow-up setting area. Moreover, 42.4 % of the studied patients were illiterate; followed with 23.5% read and write only, and 21.2 % had an above-average education, with only 11.8 % had high education. Also; 52.9 % of the studied patients were working, and 64.4% of their work required mental effort. However, 71.8% of the patients' income was enough as reported by the patients. Moreover; the health insurance covered the treatment expenses of all the studied patients.

Table 2 represented percentage distribution of the studied patients according to their clinical history. It showed that 67.1 % of the studied patients were former smokers as they had a history of tobacco use. 81.2% of the patients studied had been sick for less than five years. 95.3% of the patients reported that they didn't do their regular exercises. 43.5 % of the studied sample were suffering from side effects of the medication. The study subjects complained of mild side effects like weakness in 81% and fatigue in 75.7% of patients. 31.8% had previous heart surgeries, and 68.2% of the studied patients had a family history of coronary artery disease. 58.8% of the studied patients had a length of ICU stay of fewer than 4 days after the CABG surgery, with a mean length of (3.6 ± 1.5).

Table 3 represented the mean scores of the studied patients' symptoms burden after six weeks from the surgery. It showed that patients had different levels of symptom burden after CABG surgery, as the highest symptoms were sleep problems, followed by fatigue, depression, anxiety, poor appetite, swollen legs, palpitation, and the least common symptom burden among patients was angina, with a mean of (2.33±1.20, 2.04 ± 1.71, 1.79 ± 1.10, 1.66 ± 1.88, 1.41 ± 1.00, 1.40 ± 1.79, 1.16 ± 1.12, 1.11 ± 1.74, 0.48 ± 1.22, and 0.19 ± 0.81) respectively. The total mean of the symptom burden in all patients was (13.58 ± 11.83).

Figure 1 represented levels of symptoms burden in the studied patients, and it showed that 47.05% of the studied patients had a moderate level of symptom burden, and 35.3% had a low-moderate symptom burden, so 17.65% of the patients had a low symptom burden.

Table 4 represented the total Quality of life (QOL) mean scores of the studied patients, and it showed the quality-of-life domains' mean scores, in which physical health had the highest mean score at 62.04±11.65, perceptual health with a mean score of 60.24±7.93, economic health with a mean score of 59.88±6.81 and social health with a mean score 57.61±7.62, finally emotional health with a mean score 55.63±7.89.

Figure 2 represented levels of quality of life of the studied patients, and showed that 77**.**9% of the studied patients had a low quality of life, while 22.1% had a high quality of life.

Table 5 revealed the relationship between total patients' symptoms burden and their quality of life. It showed a positive relationship between total symptom burden and physical, social, and emotional health, with each unit increase in symptoms burden score increasing physical, social, and emotional health by 1.40, 0.666, and 0.750, respectively**.** Also; the relationship was statistically significant with P values of < .001,.005, and 0.002 and a 95 % CI of 0.742, 2.037; 0.210, 1.102 and.282, 1.219 respectively.

Table 6 showed a correlation between total patients' symptoms burden and their quality of life domains. It revealed a statistically significant positive correlation between symptom burden and physical health with r =.419 and a P value of .001. There was a statistically significant positive correlation between symptom burden and social health with r =.303 at a P value of.005. Moreover, there was a statistically significant positive correlation between symptom burden and emotional health with r =.330 at P value.002.

Table (1): Percentage distribution of the studied patients according to their personal characteristics (n=85)

Personal characteristics	NO.	%
Age (Years		
30:<40	4	4.7
40:<50	24	28.2
50:60	57	67.1
Gender		
Male	58	68.2
Female	27	31.8
Marital status		
Married	74	87.1
Divorced	11	12.9
Single	0	0
Widow	0	0
Residence		
Rural	53	62.4
Urban	32	37.6
Residence away from follow-up setting		
Yes	61	71.8
No	24	28.2
level of education		
Illiterate	35	42.4
Read and write	20	23.5
Intermediate	1	1.2
Above average	18	21.2
High	10	11.8
Occupation		
Working	45	52.9
Not working	40	47.1
Work nature (n=45)		
Muscle effort	21	35.6
Mental effort	24	64.4
Income according to patients' report		
Enough	61	71.8
Not Enough	24	28.2
Treatment expenses		
Health insurance	85	100
Others	0	0

Table (2): Percentage distribution of the studied patients according to their clinical history (n=85)

Clinical History Items	NO.	%
History of tobacco use		
Current	4	4.7
Former	57	67.1
Smokeless tobacco	24	28.2
Duration of illness in years		
≤5	69	81.2
>5	16	18.8
Practice regular exercises		
Yes	4	4.7
No	81	95.3
Suffering from side effects of medications		
Yes	37	43.5
No	48	56.5
Level of side effects of medications (n=37)		
Mild	30	81.1
Moderate	7	18.9
Type of side effects (n=37)		
Weakness and fatigue	28	75.7
Cold extremities	2	5.4
Difficulty in sleep	5	13.5
Myalgia	1	2.7
Bleeding	1	2.7
Previous heart surgeries		
Yes	27	31.8
No	58	68.2
Family History of coronary artery diseases		
Yes	58	68.2
No	27	31.8
Length of ICU stay, days		
< 4	50	58.8
≥ 4	35	41.2
X±SD	3.6 ± 1.5	

Table (3): Mean scores of the studied patients' symptoms burden after six weeks from the surgery (n=85).

Symptoms burden	Mean ± SD
Angina	0.19 ± 0.81
Dyspnea	1.66 ± 1.88
Fatigue	1.79 ± 1.10
Depression	1.41 ± 1.00
Sleep problems	2.33 ± 1.20
Surgical pain	2.04 ± 1.71
Swollen legs	1.11 ± 1.74
Palpitation	0.48 ± 1.22
Anxiety	1.40 ± 1.79
Poor appetite	1.16 ± 1.12
Total symptoms burden	**13.58 ± 11.83**

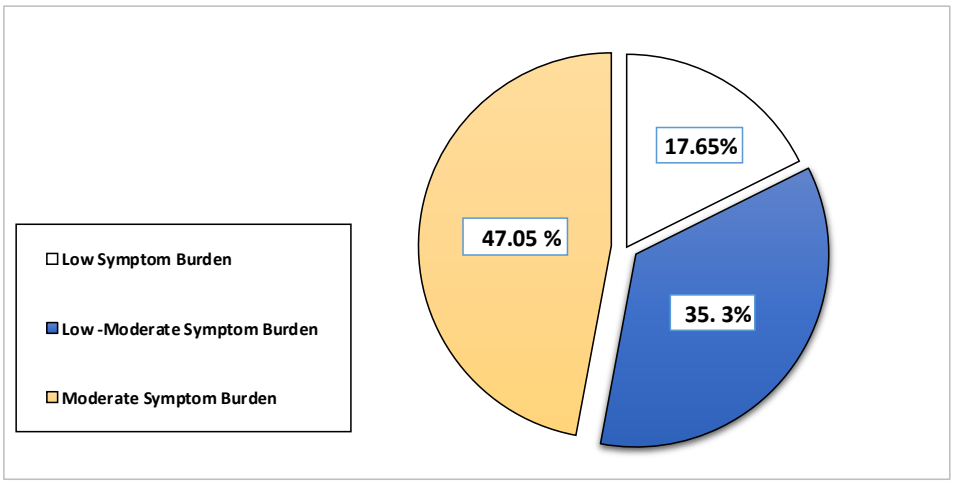

Figure 1: Levels of symptoms burden in the studied patients (n=85)

Table (4): Total Quality of life (QOL) mean scores of the studied patients (n=85).

QOL Domains	Mean ± SD
Physical health	62.04±11.65
Perceptual health	60.24±7.93
Economic health	59.88±6.81
Social health	57.61±7.62
Emotional health	55.63±7.89

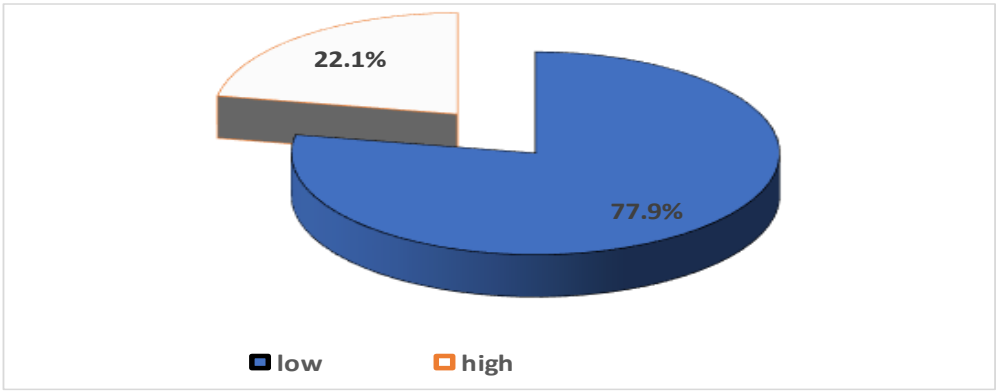

Figure 2: Levels of quality of life of the studied patients (n=85)

Table 5: Regression analysis of the relationship between total patients' symptoms burden and their quality of life

Independent Variable	Dependent variables (QoL domains)	Unstandardized Coefficients		Beta	P value	95% CI
		B	Std. Err			
Total symptoms burden	Physical health	1.408	0.334	0.419	**<.001***	0.742, 2.037
	Economic health	-0.113-	0.215	-0.057-	.601	-0.541-, 0.315
	Perceptual health	0.303	0.249	0.133	.226	-0.191-, 0.798
	Social health	0.666	0.230	0.303	**.005***	0.210, 1.102
	Emotional health	0.750	0.236	0.330	**.002***	0.282, 1.219

Table (6): Correlation between total patients' symptoms burden and their quality of life domains (n=85).

QOL Domains	Physical		Economic		Perceptual		Social		Emotional	
	r	P value	r	P Value	R	P value	r	P Value	R	P Value
Symptoms burden	.419	**<.001***	-.057	.601	.133	.226	.303	**005***	.330	**.002***

There is Pearson correlation & P value is significant (two tailed significance) ≤.05

Discussion

The general well-being of individuals and society is known as quality of life (QOL), and it distinguishes between harmful and beneficial aspects of existence. It is made up of what a person or society considers to be a good life. The values, objectives, and sociocultural setting in which a person lives inform these expectations. It acts as a benchmark by which a person or society can evaluate the various facets of a human existence **(Barcaccia et al., 2022).** The investigation of the relationship between symptom burden clusters and CABG patients' quality of life was the aim of this study.

The current study showed that around two-thirds of the studied patients aged between 50 and 60 years old, were male, and rural residents. Also, the majority of patients were married. This could be related to an increase in the risk of CHD in elderly males as a result of increased levels of total cholesterol and low-density lipoprotein cholesterol in these age groups and gender **(Chen et al., 2018).** Also, **Hajar, (2017)** discussed the risk factors for coronary artery disease, and found that the underlying pathology of atherosclerosis develops over many years and is usually advanced by the time symptoms occur, generally in middle and old age, and the risk of developing CAD increases with age and includes age >55 years especially in men.

The present study showed that less than half of the studied patients were illiterate, more than half were working, and two-thirds their work require mental effort; less than three-quarters of the patients' income was enough as reported by the patients. Moreover; the health insurance covered the treatment expenses of the entire study population. Two-thirds of the studied patients were former smokers, and four-fifths had an equal or less than 5-year duration of the disease. Almost all of the patients in the study stated that they did not engage in regular exercise.

In the same line with results of the current study, **Malakar et al. (2019)** stated that smoking and sedentary life style promote coronary occlusion as it produces endothelial aggregation and platelet adhesion to arteries sub-intimal layers, thereby increasing lipid infiltration and platelet-derived growth factors (PDGF**).** Also, the researchers explained these results as family history, smoking, past history of the disease, old age, in addition to being male are identified as risk factors for the disease.

The present study found that more than two-fifths of the studied patients were suffering from the medications' side effects, which in general were mild side effects like weakness in more than four-fifths and fatigue in three-quarters of the patients. One-third of the studied patients had previous heart surgeries, and around two-thirds had a family history of

coronary artery diseases. More than half of the patients had an ICU stay of fewer than 4 days after the CABG surgery.

The researchers interpreted these results as the disease is not chronic which cause complications to patients, make them seek medical and surgical management. Before and after surgical management for theses patients; they prescribed many medications that cause different side effects. Furthermore, the patients stay at the ICU postoperatively fore some days to be observed after the surgery for any complications.

These findings were agreed with **Tasi et al. (2019),** who reported that participants were mostly educated at a high school or greater level in two-thirds of the studied patients. More than half of the patients smoked cigarettes and did not regularly exercise, and the mean length of ICU stay was 3.6 days. Moreover, **Song et al. (2019)** found in their study of global, regional, and national prevalence and risk factors for peripheral artery disease in 2015 that most people with peripheral artery disease are smokers or hypertensive as they are positively associated with peripheral artery disease.

The current study showed that the studied patients had different levels of symptom burden after the CABG surgery, as the highest symptoms reported by patients were sleep problems and surgical pain, followed by fatigue, dyspnea, depression, anxiety, poor appetite, swollen legs, palpitation, and the least symptom burden among patients was angina. Approximately half of the studied patients had moderate levels of symptom burden, slightly more than one-third had low to moderate symptom burden, and less than one-fifth of the patients had low symptom burden. The researchers believe that recovery from cardiac surgery is a dynamic process that involves interconnections between physical, psychological, and social health and well-being.

In the same line with results of the current study, **Tsai et al. (2019)** found multiple distinct symptom trajectories for the six most disturbing symptoms after CABG: angina, dyspnea, depression, fatigue, sleep problems, and anxiety. Several characteristics, including age, longer ICU stay, fewer vessels bypassed, off-pump CABG, smoking history, and lack of regular exercise, are associated with worse symptom trajectories in patients following CABG surgeries over 3 months. Moreover, fatigue after CABG is a prominent symptom and is a predictor of both poor overall prognosis and mortality among heart failure patients. Depression is a predictor of lack of improvement in a patients' physical health after CABG surgery.

The study revealed that the physical health domain had the highest mean score of quality of life, followed by psychological health, economic health, social health, and emotional health, which had the least quality. Slightly more than three-quarters of the studied patients had a low quality of life, while less than one-quarter had a high quality of life level. The researchers believe that the disease and its management cause high burden on the patients' health with effect on different life domains, propose patients to low life quality.

In the same line **(Barco et al., 2021)** in a study titled "Quality of Life 12 Months After Coronary Artery Bypass Graft Surgery", found that significant improvements in QoL were seen in physical functioning, social functioning, and emotional status for the majority of patients with coronary artery disease. Also, **Lin et al. (2017)** reported that patients with CABG had low quality of life, particularly among older patients, that improved later with a change of lifestyle. Moreover, **Nair et al. (2018)** found that coronary revascularization with medical management provides clinically significant improvement in the quality of life of individuals concerning symptoms and overall well-being.

The current study showed a statistically significant relationship between total symptom burden and physical, social, and emotional health. With every unit increase in symptom burden score, the physical, social, and emotional health increase. Also, there was a statistically significant positive correlation between symptom burden and physical health, social health, and emotional health. The researchers believe that symptom burden affect all life dimensions negatively which propose

significant relationship between symptom burden and all dimensions of QOL.

Results from **Abbott et al. (2010)** demonstrated significant differences between symptom burden clusters on physiological functioning, self-efficacy, anxiety, and depression. Patients with higher physical functioning had minor symptoms in comparison to those with lower physical functioning who had higher symptom timing and intensity or were more challenged in the early recovery period after CABG. The low and moderate symptom burden cluster groups also differed for self-efficacy, anxiety and depression. Likewise, there were anxiety, and depression differences between the combined low-moderate and moderate symptom burden cluster groups. There were no significant interactions between the symptom burden cluster groups for either emotional, social, and mental functioning.

Conclusion

The current study concluded that the studied patients had a symptom burden after the CABG surgery that included: sleep problems, and surgical pain, followed by fatigue, dyspnea, depression, anxiety, poor appetite, swollen legs, palpitation, and the least symptom burden among patients was angina. 47.05% of the studied patients had a moderate levels of symptom burden, and 35.3% had a low-moderate levels of symptom burden, and 17.65% of the patients had a low symptom burden.

The physical health domain had the highest mean score at 62.04±11.65, followed by perceptual health with a mean score of 60.24±7.93, economic health with a mean score of 59.88±6.81 and social health with a mean score 57.61±7.62, and emotional health, which had the least quality with a mean score 55.63±7.89. Also, 77.9% of the studied patients had a low quality of life.

Also, there was a statistically significant relationship between total symptom burden and physical, social, and emotional health. With every unit increase in the symptom burden score, the physical, social, and emotional health increased. Also, there was a statistically significant positive correlation between symptom burden and physical health, social health, and emotional health.

Recommendations

The result of the present study offered the need for considering some recommendations that include: making a brochure about the management of symptoms burden clusters among CABG patients; and conducting a study to evaluate the effect of an educational program on symptoms burden and quality of life among patients with CABG.

Study limitations:

The current study has several limitations. First, sample size is relatively small which limit generalizability of data, even though the results were highly significant with excellent discriminatory power. Hence, a definite conclusion cannot be made based on this study alone. A large number of patients has to be studied to confirm the current findings. Second, the study did not investigate the long-term effects of symptom burden on quality of life. Therefore, other researches are needed to explore the effect of interventions.

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