

ISSN 2063-5346



# PATIENT COMPLIANCE AFTER CORONARY ARTERY BYPASS GRAFT SURGERY FOR THERAPEUTIC REGIMEN

Rania Ewis Ewis<sup>1</sup>, Manar Fathy Hamza<sup>2</sup>, Nora Salah Eldin Saad

Article History: Received: 02.07.2023

Revised: 15.07.2023

Accepted: 23.07.2023

**Background.** Coronary artery bypass grafting (CABG) is a major surgical operation where atherosclerotic blockages in a patient's coronary arteries are bypassed with harvested venous or arterial conduits.

**Aim of study** was to assess patient compliance after coronary artery bypass surgery toward therapeutic regimen. **Design:** A descriptive exploratory research design was used.

**Setting:** The study was conducted at cardiac outpatient clinic affiliated to Fayoum University Hospital.

**Subjects:** A purposive sample of 134 patients after coronary artery bypass graft surgery at setting mentioned before.

**Tools:** Two tools were used for data collection. Tool (I): A structured interview questionnaire consists of (2) parts. part I: Patient's demographic characteristics, part II: Medical health history of the patients. Tool (II): Patient's compliance to therapeutic regimen consists of (5) parts. Part (1): Morisky medication compliance scale. Part (2): Diet compliance scale. Part (3): Smoking. Part (4): Follow up compliance: Part (5): Exercise compliance.

**Results:** The study results reported that (54%) from the studied patient had total compliance to therapeutic regimen after coronary artery bypass graft surgery. (79%) of the studied patient had compliance to medication. (70.7%) of the studied patient had low risk for diet (high adherence to healthy diet). (61%) of the studied patient had quit smoking. (56.6%) of the studied patient had compliance to follow up. And (44%) of the studied patient had compliance to exercise.

**Conclusion:** The study concluded that more than half of the studied patient were had adequate compliance to therapeutic regimen. Regarding medication compliance majority of the studied patients had compliance to medication and compliance to healthy diet. In relation to follow up and exercise compliance less than half of studied patient had compliance to them. In the same context regarding smoking cessation about two thirds quit smoking (still trying to stop smoking).

**Recommendations:** Designing educational program for patient undergoing (CABG) surgery about the importance of adherence to therapeutic regimen.

**Keywords:** Compliance, Coronary Artery Bypass Surgery, Therapeutic Regimen.

<sup>1</sup> Clinical instructor at Faculty of Nursing, Fayoum University

<sup>2</sup> Assistant Profs of Medical Surgical Nursing, Faculty of Nursing Helwan University

DOI:10.48047/ecb/2023.12.9.235

## Introduction

Coronary artery bypass grafting (CABG) is still the most performed cardiac surgery procedure worldwide, representing annual volumes of approximately 200,000 isolated cases in the US and an average incidence rate of 62 per 100,000 inhabitants in western European countries (Nomali et al., 2023). Many studies report poor medication adherence after CABG, with about 50% of patients failing to adhere to their prescribed drug regimens. Medication non-adherence is also a common health-care issue among other chronic disease patients, and it can lead to adverse health outcomes and excess healthcare resource consumption. (Kalantzi et al., 2023) Risk factors for coronary artery disease are dyslipidaemia, hypertension, and diabetes mellitus. Also, Lifestyle, environmental factors, and genetic factors, habits such as diet, physical inactivity, smoking, age, and gender appear to be fundamental risk factors for cardiovascular diseases. (Malakar et al., 2019)

Cardiovascular disease is one of the priorities of primary and secondary prevention programs in health systems. Adherence to treatment and its positive influences on the patient's quality of life is a significant criterion for assessing the success of treatment. Thus, it can be said that health promotion is the main outcome of adherence to the treatment. Adherence to a suitable treatment regimen as well as long-term adherence to cardiovascular medications is the keystone of management and prevention of cardiovascular diseases. (Ma et al., 2019)

Non-adherent behaviours are estimated to account for 33–69% of medication-related hospitalizations and cost 100 billion dollars annually (Yu et al., 2020) Possible factors influencing adherence include the complexity of the treatment regimen, quality of information provided about the regimen, communication between provider and patient, patient ability to remember to take medications appropriately, concerns about

adverse effects, and personal preferences and beliefs about the treatment (Pedretti et al., 2023).

The American Heart Association (AHA) and the World Health Organization recognize the key role that nurses, and other team members play in supporting the goal to reduce death and disability from CVD by 25% in 2025. For more than 4 decades, nurses and advanced practice nurses have taken on key roles in managing single and multiple risk factors, including hypertension, smoking, lipids, and diabetes; the sequelae of chronic conditions, such as coronary artery disease and heart failure, through specialized clinics; and programs in primary care, worksites, and cardiac rehabilitation (Fischer et al., 2023).

By taking on a primary role as team leaders in providing case management, nurses have proven their capability to not only reduce CVD risk factors, but to also adhere to treatment guidelines and protocols, decrease hospitalization, and reduce morbidity and mortality in those with established disease. Such programs demonstrating improved outcomes and cost effectiveness have been noted in both developing and developed countries (Fan, et al., 2023).

### Significance of study:

Coronary heart disease (CHD) is now the leading cause of death worldwide. An estimated 3.8 million men and 3.4 million women die each year from CHD. In Europe CHD accounts for an estimated 1.95 million deaths each year. CHD is the most common cause of deaths in the UK. An estimated 1 in 5 men and 1 in 6 women die from the disease each year. In 2003 CHD caused around 114,000 deaths in the UK. CHD is responsible for 110,000 deaths in England each year. (Rahman and Tabassum, 2020).

In Egypt, according to the latest WHO data published in 2018 Coronary Heart Disease Deaths in Egypt reached 163,171 or 29.38% of total deaths. The age adjusted Death Rate is 271.69 per

100,000 of population ranks Egypt 15 in the world. (*World Health Rankings, 2021*).

Number of CABG surgeries performed worldwide is more than 800,000 every year. Bypass surgery is the most common type of heart surgery with more than 200,000 procedures performed each year in the United States. (*Babazono, et al, 2020*).

Therefore, the aim of this study was to assess the patient compliance toward therapeutic regimen after coronary artery bypass graft surgery.

#### **Aim of the study:**

The aim of this study was to assess patient compliance after coronary artery bypass graft surgery for therapeutic regimen through:

- Assess compliance of patient after coronary artery bypass graft surgery toward medications, follow up, exercise, smoking cessation and healthy diet.

#### **Subjects and methods:**

##### **I- Technical item:**

- The technical item includes research design, setting, subject and tools for data collection.

##### **Research design:**

Descriptive exploratory research design was used in this study.

##### **Setting:**

This study was conducted at cardiac outpatient clinic affiliated to Fayoum University Hospital.

##### **Subjects:**

A purposive sample of 134 patients after coronary artery bypass graft surgery at cardiac outpatient clinic affiliate to Fayoum University Hospital was included in the study.

##### **Tools for data collection:**

Two tools were used to collect the data during the study:

##### **Tool (1): A structured interview questionnaire:**

It was developed by the investigator and was written in simple Arabic language

based on reviewing of relevant, current national and international related literature (*Howard et al.,2022*) it was divided into two parts:

##### **Part(I): Socio-Demographic characteristics:**

It consisted of (6) closed ended questions were used to describe characteristics of the studied patients as regard (gender, age, marital status, residence, educational level, occupation).

##### **Part II: Medical health history: it includes the following.**

##### **Patient present medical history:**

It consisted of (4) questions about (Diagnosis, allergy from food, allergy from medications, present medication).

##### **Patient past medical history:**

It consisted of (5) questions about (history of chronic disease, date of surgery, complications after the surgery, family history to (cardiovascular disease and sudden death).

##### **Tool (2): Patient's compliance to therapeutic regimen:**

This tool was assessed patient's compliance after coronary artery bypass graft surgery to therapeutic regimen and it consists of (34) questions divided into five parts as following:

##### **Part 1: Morisky medication compliance scale:**

This tool was adopted from (*Morisky, Green and Levine, 1986*). The Morisky Green Levine Medication Adherence scale was used to assess adherence to medical therapy. The scale consists of (8) questions were in the form of multiple-choice questions: "Yes or No".

**scoring system regarding medication compliance** as following (zero) for (Yes) and (1) grade for (No) answer" Categories as non –adherence for score (0-3) and adherence for (4-8).

##### **Part 2: Diet compliance scale:**

This tool was adopted from *Cardiovascular Risk Assessment Questionnaire, Health World Limited, 2018*). It was used to assess

the compliance of patient to healthy diet. It consists of (10) MCQ questions.

**scoring system regarding diet compliance** as scored on a scale range from (-10\_10) categories as: low risk for score of (-19-6), medium risk (7-13) and high risk for 14 and above

### **Part 3: Smoking:**

This tool was adapted from (*Gaudel, et al, 2021*). In this study, current smokers were defined as patients who had smoked at least one cigarette during the previous month. Similarly, former smokers were defined as patients who had given up smoking for more than one month. It consists of (2) MCQ question about (smoking before surgery and smoking the last cigarette).

### **Part 4-Follow up compliance:**

This tool was adapted from (*Helmy, 2019*). It was used to assess compliance of patients to follow up in outpatient clinic after coronary artery bypass graft surgery. It contains (7) items were in the form of multiple-choice questions: "Yes or No".

**Scoring system regarding follow up compliance** as (1) grade for (Yes) answer and (0) for (No) answer. Categories as non-adherence for score (0-3) and adherence for (4-7).

### **Part 5-Exercise compliance:**

This tool was adapted from (*Helmy, 2019*). It was used to assess compliance of patients to making exercise after coronary artery bypass graft surgery. It contains (7) items were in the form of multiple-choice questions: "Yes or No".

**scoring system regarding exercise compliance** as (1) grade for (Yes) answer and (0) for (No) answer. . Categories as non-adherence for score (0-3) and adherence for (3-7).

### **Scoring system regarding total compliance**

Total compliance scores were summed and categorized as:

Adequate compliance to therapeutic regimen if the score  $\geq 60\%$  of the total score

Inadequate compliance to therapeutic regimen if the score  $< 60\%$  of the total score (*Metwaly, & Zaton, 2020*).

## **II- Operational design:**

The operational design included the preparatory phase, content validity of the developed tool, pilot study, field work.

### **A) The Preparatory phase:**

This phase was conducted through reviewing of past, current, national and international related literature and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals and magazines to develop tools for data collection. During this phase, the investigator also visited the selected place to get acquainted of the personnel and the study setting. the development of the tools was under supervisor's guidance and experts' opinions were considered.

### **B) Validity:**

The study tools were tested for validity (Content and face validity) **face validity** aimed to determine whether the tools measure what was supposed to measure. **content validity** was conducted to determine whether the tools covered the aim. it was measured by a jury of 5 experts, in the field of critical nursing, Helwan University. The experts reviewed the tool for appropriateness, comprehensiveness, accuracy, clarity, relevance, understanding and applicability and necessary modifications were done. Their opinions were elicited regarding tools consistency, rephrasing for some statements and scoring system.

### **Tools reliability:**

Cronbach's alpha test of internal consistency was calculated at alpha 0.682 for the eight items in Morisky medication compliance scale (*De Oliveira-Filho et al., 2013*).

Cronbach's Alpha was used to determine the internal reliability of the developed tool. Reliability of the tools was tested to determine the extent to which the items are related to each other. Reliability score for diet compliance scale was 0.802,

follow up compliance was 0.780 and for exercise compliance 0.786.

#### **C) Pilot study:**

The pilot study was done on 10% of the sample (14 patient ) to test applicability ,feasibility and clarity of questions and time needed to complete the study tools .subjects were included and chosen randomly from the previously mentioned setting then later included to the sample. According to the results of the pilot study, no modifications were done for the used tools.so patients shared in the pilot study were involved in the sample.

#### **D)Field work:**

##### **Preparatory phase:**

- An approval was obtained from the director of Fayoum university hospital.
- Data of the current study were collected from June 2022 to December 2022, official permissions were granted. A total number of 134 patients who fulfilled the criteria of inclusion were recruited into the present study.

##### **Implementation phase:**

- The investigator collected data 2 days/week in the morning shift from 8 AM to 2 PM to detect the number of patients post CABG patients after 6 months that were visiting the clinic during the time of the study.
- Each patient was interviewed and assessed individually and the patients oral acceptance to be included in the study was obtained after explaining the purpose and the nature of the study and the interviewing questionnaire was filled .the investigator collected about (2-3) patients per day.
- The interviewing sheet was filled in a time ranged between (30-40) minutes according to patients' tolerance. tool 1 filled in a time ranged between (5-10) minutes, tool 2 filled in a time ranged from (10-20) minutes. every patient was allowed to ask any question to clear any misunderstanding.
- A code number was used for every patient to ensure anonymity and to compare between them.

#### **III- Administrative Item:**

After explanation of the study aim and objectives, an official permission was obtained by submission of formal letter issued from the Dean of faculty of nursing, Helwan university to the Director of Fayoum university hospital at which the study was conducted. The title, aim and expected outcome of the study had been illustrated asking for cooperation and permission to conduct the study.

#### **Ethical considerations:**

An official permission to conduct the proposed study was obtained from the Scientific Research Ethics Committee Helwan University. Participation in the study was voluntary and subjects given complete full information about the study and their role before participating in the study. The ethical considerations were included explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information where it was not be accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs was respected.

#### **IV- Statistical Item:**

Upon completion of data collection, data was computed and analyzed using Statistical Package for the Social Science (SPSS), version 24 for analysis. For quantitative data, numbers, percentage, mean and standard deviation (SD) were used to describe the results. For qualitative data, frequency and percentage distribution of each category were calculated. Appropriate significance was adopted at  $p \leq 0.05$  for interpretation of results. The observed differences were considered as not significant if  $p > 0.05$  and significant if  $p \leq 0.05$ . Appropriate inferential statistics such as chi-square was used as well.

#### **Results:**

**Table (1):** shows that 60.4% of the studied patient were more than 50 years old with Mean  $\pm$  SD 47.98  $\pm$  8.78 , 58.2 % of them were male patient ,84.3 % of them were married ,61.9 of them were from rural areas and 35.1 % of them were graduated from secondary school .



**Table (2):** illustrate that 37.3 % of the studied patient had diabetes as chronic disease ,29.8 % of them had hypertensive as chronic disease ,53% of them made the surgery from more than 18 month and less than 12 month ,100% of them had no complications after (CABG)surgery , 58.2 % of them had no family history for cardiovascular disease and 64.9% of the studied patient had no family history for sudden death .

**Figure (1):** shows that 79.1% of the studied patient were compliance to medication ,20.9% of them non-compliance to medication.

**Figure (2):** shows that 70.7 of the studied patient had low risk for diet(high adherence to healthy diet ) and 9.1% of them had moderate risk for diet.

**Figure (3):** indicate that 62.7% of the studied patient were smoking and 37.3% from them never smoked yet.

**Figure (4):** illustrate that 61.8% of the studied patient quit smoking (still trying to

stop smoking),38.2% of them current smoking.

**Figure (5):** shows that 56.5% of the studied patient were compliance to follow up and 43.5 % of them were non- compliance to follow up.

**Figure (6):** shows that 56 % of the studied patient were non-compliance to exercise and 44 % of them were compliance to exercise.

**Figure (7):** illustrate that 53.7% of the studied patient had adequate compliance to therapeutic regimen and 46.3% had in adequate compliance to therapeutic regimen.

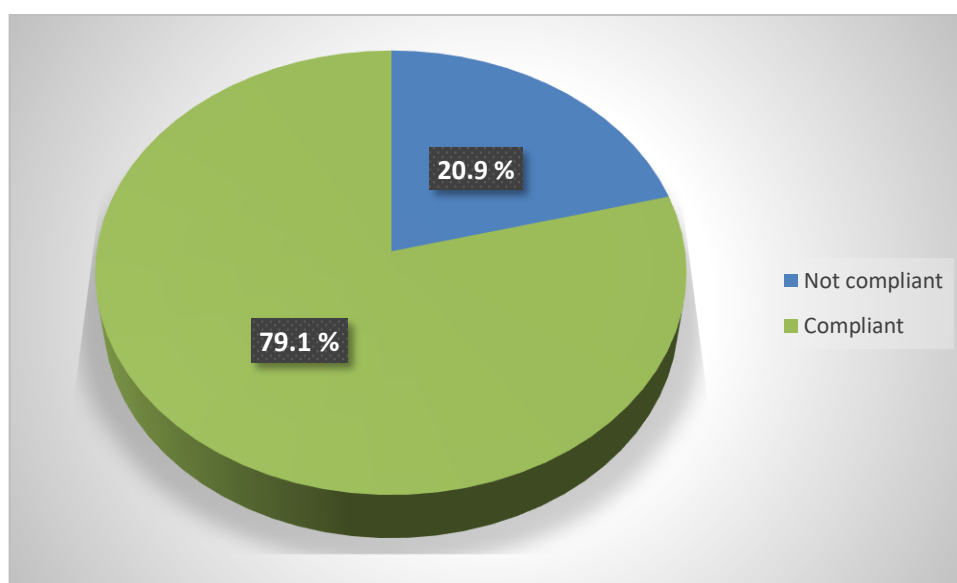
**Table (3):** show that there were statistical significance relations between the total compliance scores of the studied patient and (age, gender, marital status. educational level, occupation with p value (0.009, 0.318, 0.016, 0.043, 0.004) respectively.

**Table (1): Frequency and percentage distribution of the studied patients according to their demographic characteristics (N=134).**

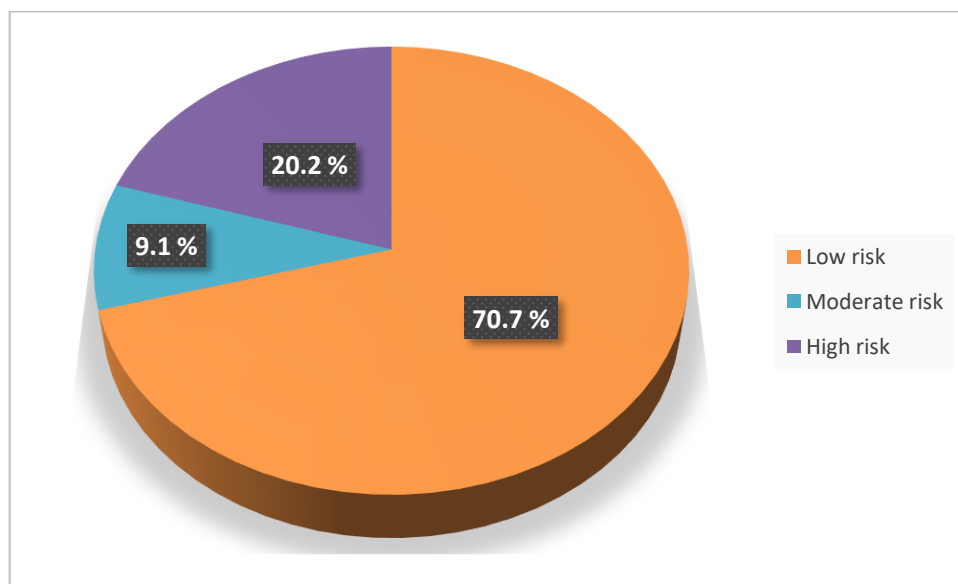
Patients' characteristics		No	%
Age (in years)	20 < 30	2	1.5
	30 < 40	26	19.4
	40 < 50	25	18.7
	≥ 50	81	<b>60.4</b>
Mean ± SD	47.98 ± 8.78		
Gender	Male	78	<b>58.2</b>
	Female	56	41.8
Marital status	Single	2	1.5
	Married	113	<b>84.3</b>
	Divorced	0	0.0
	Widow	19	14.2
Residence	Rural	83	<b>61.9</b>
	Urban	51	38.1
Educational level	No read and write	44	32.8
	Read and write	23	17.2
	Secondary education	47	<b>35.1</b>
	University education	20	14.9

**Table (2): Frequency and percentage distribution of the studied patients according to their past medical and family history (N=134).**

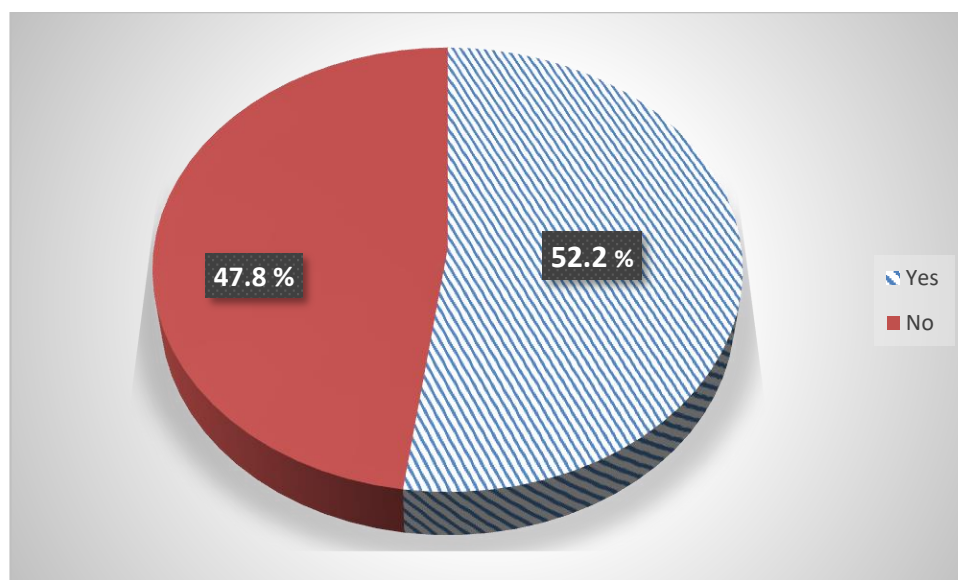
Patients ' characteristics	No	%
<b>History of chronic disease *</b>		
Hypertension	40	29.8
Diabetes	50	37.3
Heart disease	24	17.9
Liver disease	6	4.4
Other	37	27.6
<b>Date of coronary artery bypass graft surgery</b>		
< 12 months	11	8.2
12- <18 months	71	53.0
18- 24 months	52	38.8
<b>Complications after the CABG surgery</b>		
Yes	0	0.0
No	134	100.0
<b>Family history for cardiovascular disease</b>		
Yes	56	41.8
No	78	58.2
<b>Family history for sudden death</b>		
Yes	47	35.1
No	87	64.9

**Figure (1): Percentage distribution of the studied patients according to total medication compliance scores (N=134).**

**Figure (2): Percentage distribution of the studied patients according to total diet adherence scores (N=134).**

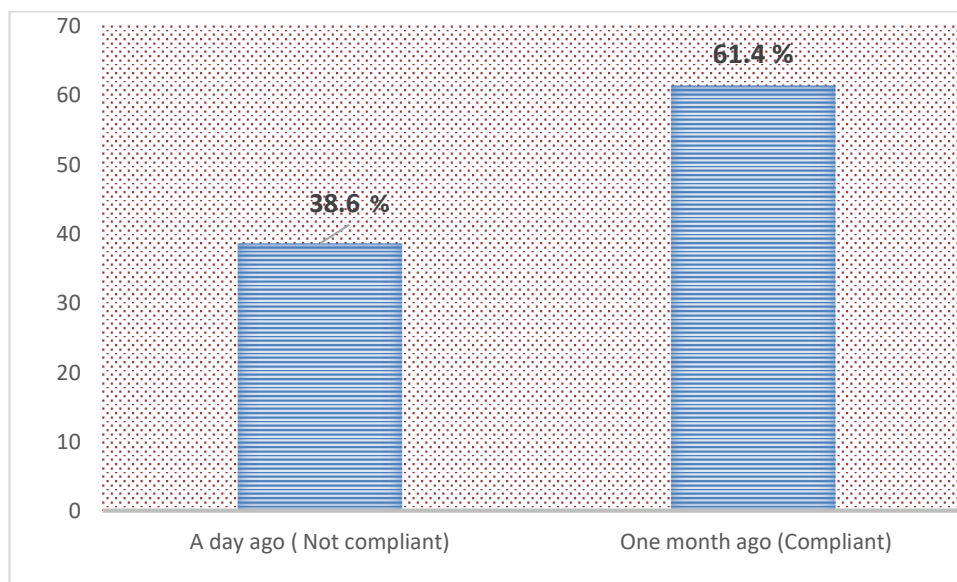


**Figure (3): Frequency and percentage distribution of the studied patients according to their smoking history before surgery (N=134).**





**Figure (4): Frequency and percentage distribution of the studied patients according to their compliance to avoidance of smoking (N=70).**



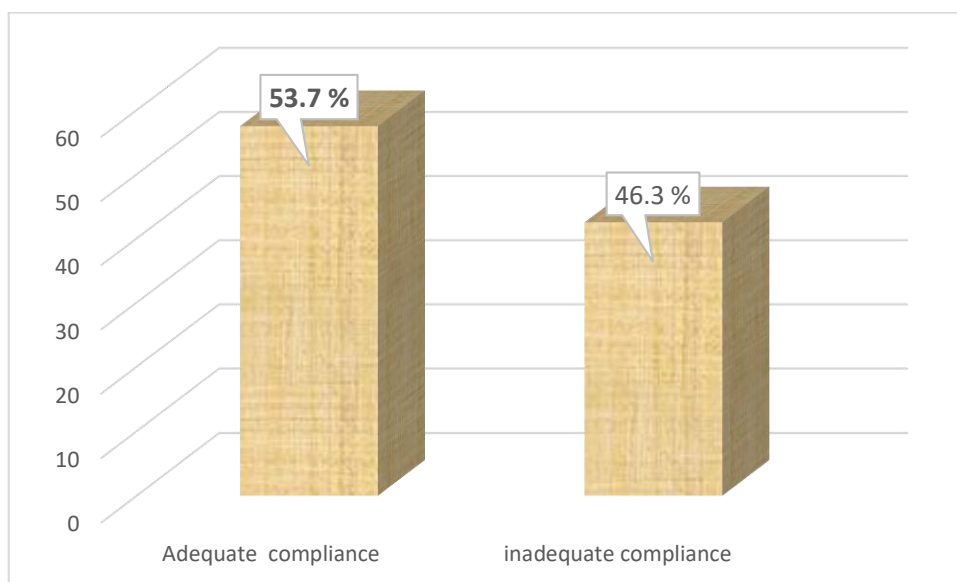
**Figure (5): Percentage distribution of the studied patients according to total follow up compliance scores (N=134).**



**Figure (6): Percentage distribution of the studied patients according to total exercise compliance scores (N=134)**



**Figure (7): Percentage distribution of the studied patients according to total compliance to therapeutic regimen (N=134).**



**Table (3): Relations between total compliance scores of the studied patients and their demographic characteristics (N=134).**

Patients' Characteristics		Total compliance		Chi square	P value
		No compliance (n=72)	compliance (n= 62)		
Age ( in years)	20 < 30	0	2	11.504	0.009 *
	30 < 40	17	9		
	40 < 50	8	17		
	≥ 50	47	34		
Gender	Male	42	36	0.999	0.318
	Female	30	26		
Marital status	Single	2	0	8.316	0.016 *
	Married	54	59		
	Divorced	0	0		
	Widow	16	3		
Residence	Rural	54	29	28.202	0.000 **
	Urban	18	33		
Educational level	Doesn't read or write	20	24	8.132	0.043 *
	Read or write	15	8		
	Secondary education	31	16		
	University education	6	14		
Occupation	Governmental work	21	33	13.216	0.004 *
	Non - governmental work	18	16		
	Retirement	3	2		
	Other work	30	11		

\* Significant (S)  $p \leq 0.05$ \*\* Highly significant (S)  $p \leq 0.001$ **Discussion:**

**Regarding socio demographic characteristics of studied patients.** the current study illustrated that about two thirds of the studied patient aged more than or equal 50 years old, this finding may indicate that the coronary artery disease were common among this age groups, this result agreed with *Pulimala, et al., (2020)* who reported that the age of studied group was < 60 years old, but this result is contradicted with *Sayed., et al (2019)* who reported that about half of patient were (51-70) years old from the studied patient, from the investigator point of view that

implies high rate risk regarding age to coronary artery disease and due to increased life stressors even among people in this age group.

**Relating to gender,** the current study indicated that more than half of the studied patient were male, this result is in the same line with *Pačarić., (2020)* who reported that more than half of participants were male, but this result contradicted with *Muthukrishnan., et al (2023)* who reported that the most of participants were male. **From the investigator point of view,** this finding may be due men's coping with stressful events were less adaptive

physiologically, behaviorally and emotionally. Which these contributing to their increased risk for cardiac heart disease, in addition to unhealthy lifestyle as smoking.

**Related to marital status**, the current study revealed that the majority of the studied patients were married, this result is in the same line with *Pulimala, et al.,(2020)* who reported that the majority of participants were married, on the other hand this result is disagreed with *Pačarić.,(2020)* who reported that more than two thirds of the participants were married.

**In relation to residence**, the current study showed that about two thirds of the studied patients were living in rural areas, this might be due to the hospital where I collected the data, this result disagrees with *Pohekar et al.,(2021)* who reported that about one third of the participations living in rural areas, from the investigator point of view this is related to the hospital collected data from.

**Relating level of education**, the current study revealed that more than one third of the studied patients had secondary education. This result is disagreed with *Pohekar et al., (2021)* who reported that about one third had secondary education from the studied patients. From the investigator point of view, this finding that may due to social factor and financial factor make patients in this age group see that this level of education was enough.

**Regarding present medication use** the current study mentioned that more than half of patients take antihypertensive medications, this result is in disagreement with *Ahmed et al., (2023)*, who mentioned that the majority of participation suffering from hypertension, from the investigator point of view High blood pressure (hypertension) significantly increases the risk of heart disease or stroke, This is because high blood pressure damages the lining of the arteries.

**In the same context** the current study reported that more than one third of

the studied patient had diabetes, this result is in the same line with *Sinnadurai et al.,(2022)*, who reported that more than one third from the studied patient suffering from diabetes, more over this result is in the same line with *Khaled., (2023)* who report that more than one third from the studied patient had diabetes, from the investigator point of view this result related to the aged group of the study that majority of patient more than 50 years old so they had high risk to type 2 diabetes and high blood sugar can damage blood vessels and the nerves that control the heart.

**Regarding family history to cardiovascular disease** the current study revealed that more than half of patient had family history for cardiovascular disease, this result disagrees with *Metwaly, E. A., & Zatton, H. K. (2020)* who reported that the most of patient didn't have family history, from the investigator point of view this was related to the lifestyle in Egypt, all family live with each other and making the same things such as diet healthy or not, doing exercise or not, it can call family culture.

**Considering medication adherence** the present study indicated that the majority of the studied patient had medication adherence, this result agreed with *Taha.,et al (2022)* in Egypt, who reported that the majority of patients had high level of adherence. Moreover, this result is in the same line with *sayed et al.,(2019)* who reported that the majority of participants were take medication regularly. This result disagreed with *Gaudel.,et al (2022)* who reported that about two thirds of patients had medium adherence to medications.

**Regarding adherence to healthy diet** the present study shows that more than two thirds from the studied patient had adherence to healthy diet, this result is in the same line with *Nair.,et al (2018)* who reported that more than two thirds of participants had satisfactory compliance to healthy life style practice, this result is disagreed with *Keating et al., (2022)*

which mentioned that more than half of participants report that eating a healthy diet most of the time. moreover, this result is contradicted with **sayed et al., (2019)** who mentioned that the majority of participations were take high salt and fat diet, which reflect noncompliance to diet.

**In relation to total diet adherence** the current study illustrated that more than two thirds of patient had high adherence to healthy diet (low risk to diet),this result is in the same line with **Gaudel .,et al (2021)** Who mentioned that about two thirds from the participations had high adherence to healthy diet (low risk to diet).

**Regarding smoking** the current study revealed that more than half of studied patient were smoking, this result in the same line with **Højskov.,et al ( 2020)** who reported that more than half from the studied patients were previous smoking .Moreover the study in the same line with **Wehaida,et al (2021)** who reported that more half of participation were smokers.

**Regarding smoking cession** the current study revealed that about two thirds from the men patient quit smoking ,this result was in the same line with **Faggiano,et al (2019)** Who reported that about two thirds from men patient quit smoking ,more over this result is in the same line with **De Bacquer., et al( 2022)** who reported that about two thirds tried to reduce.

**In the same context**, the current study mentioned that about half of studied patient never smoking, this result in the same line with **Gaudel., et al (2022)** who mentioned that about half of patients were never smoking.

**Relating to current smoking patient** the current study revealed that more than one third of studied patient still smoking. This result is dissimilar to **Yousef Said et al., (2022)** who report that half of patient had in healthy behaviour regarding smoking.

**Regarding follow up compliance** the current study revealed that more than half of patients were compliance to follow

up, this result is in agreed with **Nair .,et al (2018 )** who reported that more than half of patient made follow up after CABG between 6 month to 2 years .This result disagreed with **Salari,et al (2016)** who reported that less than one quarter from participations were have acceptable follow up adherence ,more over this result is dissimilar to **Yousef Said et al .,(2022)** in Egypt who report that the majority of studied patient had unhealthy behaviour regarding follow up .

**Regarding exercise** the current study revealed that more than one third were compliance for exercise, this result in the same line with **Wang.,et al (2022)** who reported that more than one third were make moderate physical activity , on the other hand this result is contradicted with **Faggiano,et al (2019)** who reported that more than one third from the studied patient were noncompliance to physical activity ,more over this result is contradicted with **De Bacquer., et al (2022 )**who reported that about two thirds from the participations perform low level of activity outside the work .

**Regarding the total compliance to therapeutic regimen** the current study revealed that more than half of patients were compliance to therapeutic regimen, this result is in disagreement with **Nair., et al (2018)** who reported that more than two thirds were satisfactory compliance to lifestyle practices, moreover this result is disagreed with **De Bacquer., et al (2022)** *who* reported that less than a third of all patients was on target for all three lifestyle factors.

**As regards relations between the total compliance scores of the studied patient and demographic characteristics**, the present study showed that there were statistical significance relations between the total compliance scores of the studied patient and (age, gender, marital status. educational level, occupation, this result in the same line with **Sallam et al., (2021)** who report That there was highly significant relation between patient total



compliance and demographic characteristics.

**In the same context**, this result was inconsistent with the study performed by *Taha et al., (2018)* at Egypt with sample size was 72 patients and reported that patient related factor had no significant relation with their compliance score at p value  $>0.05$ .

**In the same context**, the present study showed that there were statistical significance relations between the total compliance scores of the studied patient and gender, this result is disagree with *mandoor ., (2013)* who report that there is no significant relation between gender and compliance to treatment regimen .

**Regarding the relation between the total compliance and marital status,**

#### Conclusion:

**Based on the finding of the current study, it can be concluded that:**

Regarding total compliance to therapeutic regimen, the current study revealed that more than half of the studied patient were had adequate compliance to therapeutic regimen. Regarding medication compliance the majority of the studied patients had compliance to medication and compliance to healthy diet. In relation to follow up and exercise compliance less than half of studied patient had compliance to them. in the same context regarding smoking cession about two thirds quit smoking (still trying to stop smoking)

#### Recommendations

##### References:

- Ahmed, N. M., Mekkawy, M. M., Hussein, A. H., & Ahmed, M. M. (2023).** Functional Health Status Assessment for Patients Undergoing Coronary Artery Bypass Graft. *Assiut Scientific Nursing Journal*, 11(34), 247-259.
- Babazono, A, Jamal, A, Fujita, T, Yoshida, S, & Kim, S (2021):** Variation in the use of percutaneous coronary interventions

the present study showed that there were statistical significance relations between the total compliance scores of the studied patient and marital status, this result disagrees with *Ravi et al., (2013)* who reported that there no statistically significant relation between marital status and level of compliance.

**In the same context**, the present study showed that there were statistical significance relations between the total compliance scores of the studied patient and age, this result is consistent with *park., (2018)* who conduct study in south Korea, about "medication compliance and beliefs about medication in elderly patient living alone with chronic disease" who report that compliance to treatment had no significant relation with different age groups.

**Based on findings of the current study, the investigator recommended the following:**

- Designing educational program for patient undergoing (CABG) surgery about the importance of adherence to therapeutic regimen.
  - Illustrate, simple, comprehensive Arabic language guided booklet with images should be submitted to each newly admitted patient before CABG surgery.
- Further research.**
- Conduct a study to assess factors affect cardiac patient adherence to medication and lifestyle change.
  - Implementing further research to observe changes of compliance through time.

among older patients with acute coronary syndromes: a multilevel study in Fukuoka, Japan. *International journal for equity in health*, 20(1), 1-13.

- De Bacquer, D., Astin, F., Kotseva, K., Pogosova, N., De Smedt, D., De Backer, G., ... & EUROASPIRE IV and V surveys of the European Observational Research Programme of the European Society of Cardiology. (2022).** Poor adherence to

- lifestyle recommendations in patients with coronary heart disease: results from the EUROASPIRE surveys. *European Journal of Preventive Cardiology*, 29(2), 383-395.
- De Oliveira-Filho, A., Morisky, D., Neves, S., Costa, F., Pereira, D. (2013).** The 8-item Morisky Medication Adherence Scale: Validation of a Brazilian-Portuguese version in hypertensive adults. *Research in social and administrative pharmacy*, 1-8.
- Faggiano, P., Fattiroli, F., Frisinghelli, A., Piccioli, L., Dasseni, N., Silverii, M. V., ... & Giallauria, F. (2019).** Secondary prevention advices after cardiovascular index event:
- Fischer, M. O., Brotons, F., Briant, A. R., Suehiro, K., Gozdzik, W., Sponholz, C., ... & VENICE Study Group. (2022).** Postoperative pulmonary complications after cardiac surgery: the VENICE International Cohort Study. *Journal of cardiothoracic and vascular anesthesia*, 36(8), 2344-2351.
- Fan, W., Guo, C., Zhao, Q., & Ma, H. (2023).** A comprehensive review of the components of nurse-coordinated care which are most effective in preventing coronary heart diseases. *African Health Sciences*, 23(1), 528-34.
- Gaudel, P., Neupane, S., Koivisto, A., Kaunonen, M., & Rantanen, A. (2021):** Effects of a lifestyle-related risk factor modification intervention on lifestyle changes among patients with coronary artery disease in Nepal. *Patient Education and Counseling*, 104(6), 1406-1414.
- Gaudel, P., Neupane, S., Koivisto, A. M., Kaunonen, M., & Rantanen, A. (2022).** Effects of intervention on lifestyle changes among coronary artery disease patients: A 6-month follow-up study. *Nursing Open*, 9(4), 2024-2036.
- Helmy, A (2019):** Factors Affecting Liver Cirrhosis compliance Toward Therapeutic Regimen. Unpublished Master Thesis, Faculty of Nursing Helwan University.
- Howard, R., Albright, J., Powell, C., Osborne, N., Corriere, M., Laveroni, E., ... & Henke, P. (2022).** Underutilization of medical management of peripheral artery disease among patients with claudication undergoing lower extremity bypass. *Journal of vascular surgery*, 76(4), 1037-1044.
- Højskov, I. E., Thygesen, L. C., Moons, P., Egerod, I., Olsen, P. S., & Berg, S. K. (2020).** The challenge of non-adherence to early rehabilitation after coronary artery bypass surgery: Secondary results from the SheppHeartCABG trial. *European Journal of Cardiovascular Nursing*, 19(3), 238-247.
- Kalantzi, V., Kalafati, I. P., Belitsi, V., Tsiampalis, T., Koutsonasios, I., Androutsos, O., ... & Kosti, R. I. (2023).** Cardiometabolic Patient-Related Factors Influencing the Adherence to Lifestyle Changes and Overall Treatment: A Review of the Recent Literature. *Life*, 13(5), 1153.
- Keating, T., AlAdalieh, M., Chughtai, Z., & Javadpour, S. H. (2022).** Adherence to secondary prevention recommendations after coronary artery bypass graft surgery. *Irish Journal of Medical Science (1971-)*, 1-6.
- Khalad, E (2023):** Factors Related To Complications After Discharge From Open Heart Surgery, Unpublished Master Thesis, Faculty of Nursing Helwan University.
- Malakar, A. K., Choudhury, D., Halder, B., Paul, P., Uddin, A., & Chakraborty, S. (2019).** A review on coronary artery disease, its risk factors, and therapeutics. *Journal of cellular physiology*, 234(10), 16812-16823.
- Ma, T. T., Wong, I. C., Man, K. K., Chen, Y., Crake, T., Ozkor, M. A., ... & Wei, L. (2019).** Effect of evidence-based therapy for secondary prevention

- of cardiovascular disease: Systematic review and meta-analysis. *PLoS One*, 14(1), e0210988.
- Mandoor, N. (2013):** Compliance Of Patient After Kidney Transplantation Toward Therapeutic Regimen, Master Thesis, Faculty Of Nursing ;Ain Shams University, Medical Surgical ,Nursing Department ,Egypt ,P.P.8.
- Metwaly, E. A., & Zaton, H. K. (2020).** Effect of health educational program on self efficacy and therapeutic compliance among patients with myocardial infarction. *Egyptian Journal of Health Care*, 11(2), 214-228.
- Muthukrishnan, A., Tayyib, N. A., Alsolami, F. J., Ramaiah, P., & Lathamangeswaric, C. (2023).** Anxiety and quality of life outcomes after coronary artery bypass graft surgery-A prospective cohort study. *Current Problems in Cardiology*, 48(2), 101474.
- Nomali, M., Heidari, M. E., Ayati, A., Moghaddam, K., Mosallami, S., Khosravi, A., ... & Roshandel, G. (2023).** Risk factors of in-hospital mortality for isolated on-pump coronary artery bypass graft surgery in the northeast of Iran from 2007 to 2016. *Irish Journal of Medical Science (1971-)*, 1-9.
- Nair, V. V., Nair, J. T. K., Das, S., Singh, K. K., Kathayanat, J. T., Radhakrishnan, R., ... & Babu, A. (2018).** Lifestyle practices, health problems, and quality of life after coronary artery bypass grafting. *Indian Journal of Thoracic and Cardiovascular Surgery*, 34, 476-482.
- Opoku-Acheampong AA, Rosenkranz RR, Adhikari K, Muturi N, Logan C, Kidd T. Tools for Assessing Cardiovascular Disease Risk Factors in Underserved Young Adult Populations (2021):** A Systematic Review. *Int J Environ Res Public Health*.;18(24):13305.
- Park, H. Y., Seo, S. A., Yoo, H., & Lee, K. (2018).** Medication adherence and beliefs about medication in elderly patients living alone with chronic diseases. *Patient preference and adherence*, 175-181.
- Pedretti, R. F., Hansen, D., Ambrosetti, M., Back, M., Berger, T., Ferreira, M. C., ... & Abreu, A. (2023).** How to optimize the adherence to a guideline-directed medical therapy in the secondary prevention of cardiovascular diseases: a clinical consensus statement from the European Association of Preventive Cardiology. *European journal of preventive cardiology*, 30(2), 149-166.
- Poznyak, A. V., Sadykhov, N. K., Kartuesov, A. G., Borisov, E. E., Melnichenko, A. A., Grechko, A. V., & Orekhov, A. N. (2022).** Hypertension as a risk factor for atherosclerosis: Cardiovascular risk assessment. *Frontiers in Cardiovascular Medicine*, 9, 959285.
- Pačarić, S., Turk, T., Erić, I., Orkić, Ž., Petek Erić, A., Milostić-Srb, A., ... & Nemčić, A. (2020).** Assessment of the quality of life in patients before and after coronary artery bypass grafting (CABG): a prospective study. *International journal of environmental research and public health*, 17(4), 1417.
- Pulimala, S., Ghanta, V., Kola, S., Kavuri, P., Kancherla, H., Premika, S., & Swaroopa, M. (2020).** Assessment and evaluation of health-related quality of life after coronary artery bypass grafting (CABG) in a tertiary care teaching hospital. *Indian Journal of Pharmacy and Pharmacology*. 7 (2), 136-141.
- Pohekar, S., Singh, S., & Gujar, S. (2021).** To Assess the Effectiveness of Video-Assisted Teaching on Knowledge Regarding Lifestyle Modifications and Drug Regimen in Postoperative Coronary Artery Bypass Graft (CABG) Patients Attending

- OPD. *Indian Journal of Forensic Medicine & Toxicology*, 15(2), 801-808.
- Rahman, A., & Tabassum, A. (2020):** Model to assess the factors of 10-year future risk of coronary heart disease among people of Framingham, Massachusetts.  
Morisky, L. Green, D. Levine, (1986): Concurrent and predictive validity of a self-reported measure of medication adherence, *Med. Care* 24 67–74.
- Ravi, S., Toosi, M. N., Karimzadeh, I., Ahadi-Barzoki, M., & Khalili, H. (2013).** Adherence to chronic hepatitis C treatment regimen: first report from a referral center in Iran. *Hepatitis monthly*, 13(6).
- Sayed, S. A. M., Ibrahim, W., & Abdalla, H. M. A. (2019).** Patient Compliance toward Medication and Lifestyle Change after Coronary Artery Bypass Grafting in Ahmed Gassim Hospita Khartuom Locality–Sudan 2018. *J Nurs Care*, 8(495), 2.
- Sallam, G. K. S., Abdalla, K. F., & Mahmoud, S. F. (2021).** Effect of an Educational Program for Patients Post Coronary Artery Bypass Surgery on the Compliance with Symptoms Management Strategies. *Indian Journal of Forensic Medicine & Toxicology*, 15(4).
- Sinnadurai, S., Sowa, P., Jankowski, P., Gasior, Z., Kosior, D. A., Haberka, M., ... & Kaminski, K. (2022).** Recollection of physician information about risk factor and lifestyle changes in chronic coronary syndrome patients. *International Journal of Environmental Research and Public Health*, 19(11), 6416.
- Salari, A., Hasandokht, T., Mahdavi-Roshan, M., Kheirkhah, J., Gholipour, M., & Tootkaoni, M. P. (2016).** Risk factor control, adherence to medication and follow up visit, five years after coronary artery bypass graft surgery. *Journal of cardiovascular and thoracic research*, 8(4), 152.
- World health ranking** (world health statistics 2021)
- Taha, N. M., Mohamed, K. A., & Abd El-Moneam, S.** Medication Adherence in Patients with Coronary Artery Bypass Grafting. *Trends in nursing and health care journal*. volume 5 issue 2. Pages 147-167
- Wang, J., Zeng, Z., Dong, R., Sheng, J., Lai, Y., Yu, J., & Zuo, H. (2022).** Efficacy of a WeChat-based intervention for adherence to secondary prevention therapies in patients undergoing coronary artery bypass graft in China: A randomized controlled trial. *Journal of Telemedicine and Telecare*, 28(9), 653-661.
- Wehaida, S. M., Abd El-Hay, S. A., & Allah, A. K. A.** Effect of Implementing Instructional Learning Package for Patients with Coronary Artery Disease on Compliance of Practice about Therapeutic Regimen and Barriers Affecting it. From drug prescription to risk factors control in real world practice. *Monaldi Archives for Chest Disease*, 89(2).
- Yousef Said, N., Houssien Nasr, M., & Nadr Ebraheim, M. (2022).** Assessment of Patients' Knowledge and Lifestyle Before Coronary Artery Bypass Grafting Surgery. *Egyptian Journal of Health Care*, 13(1), 1065-1071.
- Yu, C., Liu, C., Du, J., Liu, H., Zhang, H., Zhao, Y., ... & MISSION-2 Collaborative Group. (2020).** Smartphone-based application to improve medication adherence in patients after surgical coronary revascularization. *American heart journal*, 228, 17-26.