

Guidelines for the Factors Affecting Compliance of Patients with Coronary Artery Bypass Graft toward Therapeutic Regimen

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Abstract: The effective prevention of CABG complications is based on the correct adoption of life style and patients' compliance with therapeutic regimen as a lot of patients refuse treatment or give it up in the fight against the disease. Therefore, chronic illnesses needs modifications in a person's life style and require continuous adaptation. Therapeutic adherence can only be obtained if the patient has accepted his/her disease and understands the significance of the treatment proposed. This study was aiming to assess compliance of patients with CABG, assess the factors affecting compliance to therapeutic regimens among patients with CABG. The study was conducted at the Cardiology outpatients' clinic at El khames military hospital. Purposive samples of one hundred adult patients with CABG. A questionnaire sheet was used for data collection. The results of this study illustrated that there was statistically significant relation between over all patients compliance & their information about therapeutic regimen including : post-operative complication & how to avoid it, side effect of drugs & how to deal with it ,care of wound during of bathing, health diet ,possible complication and to discover it, and avoid infection. The study recommended that the therapeutic education for patients undergoing CABG should be started from the first day of their admission to the cardiothoracic unit. And nurses should educate patients and their families about the therapeutic regimen including medications, diet, exercise and activity, early warning signs, self-care and precipitating factors that should be avoided. Also, follow-up for the patients' compliance with therapeutic regimen by a community health nurse should be done periodically.

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1.Introduction

According to (Carrier, M., & Harrington, R.A, 2008) coronary artery bypass grafting (CAB G) effectively relieves angina, results in longer survival, and a better quality of life in specific subgroups of patients with obstructive coronary artery disease. Due to the high incidence of coronary artery disease worldwide, as well as the effectiveness of the surgical procedure, CABG surgery makes up one of the top ten most frequently performed procedures in North America and Europe.

Approximately 519, 000 procedures are performed each year in Europe. This surgical procedure accounts for more healthcare resources than any other single procedure and for more than \$10 million in healthcare costs annually. As regard to EL Malak Fahed Hospital records 420 patients were admitted to cardio-thoracic unit, 127 of them performed CABG within 2011-12.

Coronary artery bypass graft surgery is advised for selected groups of patients with significant narrowing and blockages of the nearest arteries (coronary artery disease). This surgery creates new routes around narrowed and blocked arteries, allowing sufficient blood flow to deliver oxygen and nutrients to the heart muscle.²⁸

Coronary artery bypass graft surgery is a surgical procedure performed to relieve angina and reduce the risk of death from CAD. Arteries or veins from elsewhere in the patient's body are grafted from the aorta to the coronary arteries to bypass atherosclerotic narrowing and improve the blood supply to the coronary circulation supplying the myocardium (heart muscle)⁴¹

The nurse is an important advocate in helping the patient and family understanding the complexities of treatment decisions and manage the side effects, toxicities of drugs and complications c CABG. A patient empowered by knowledge of the disease and treatment can have more positive influence on the compliance with treatment³⁶

Compliance is defined as the extent to which patient behavior change in term of taking medications, following diets exercising and other life style changes.

⁴⁴ Compliance is an essential component in the success of preventive and the therapeutic efforts along with the efficacy of the suggested course of action. It is an active, internal and responsible process whereby patients assume responsibility aim to maintain their health in collaboration with health care staff².

In nursing, patients' compliance is seen more widely than widely as behavior complying with medical advice. However, patients' compliance improves when nurses listen to them and give them the information they need. In addition, nurses are in the position of being able to provide information through communicating with the clients with multitude of problems. They are in a unique position to develop interventions that will impact and enhance patients' ability to adhere to their prescribed regimens²⁹.

Non-compliance (non-adherence) to drugs or failure to take drugs on time in the dosages prescribed is as dangerous and costly as many illnesses.²¹ stated that, non-compliance also is associated with increase cost of treatment, more severe illness, and frustration of both patient and health care provider. Studies have shown that non-compliance causes 125,000 deaths annually in the US, leads to 10 to 25 percent of hospital and nursing home admissions, and is becoming an international epidemic²⁶.

According to⁴³ in the clinical area, no adherence at any point in the treatment continuum poses a threat to satisfactory outcomes. Many studies report that non-compliance can have an effect on morbidity and mortality associated with cardiovascular disease regardless of when it occurs in the treatment continuum. Compliance is part of helping relationship between health care providers and patient. The patient has the right to choose not to follow the advice, set his or her goal and making his or her decision, so the patient *will* be responsible for maintaining behavior change through his or her life³⁹

Earlier studies have shown that compliance is probably poorer in disease which requires a change of lifestyle than in those that don't require any such action. Compliance requires the patients to be active and to collaborate with health care professionals when setting goals for their treatment and defining the methods by which these goals can be achieved. Patients should change their lifestyle. The treatment should be part of patients' lives.⁴³

Many studies suggested that patients who adhere to their regimens have better outcomes: they live longer, enjoy a higher quality of life, and suffer fewer symptoms than those who don't.⁴²

Significance of the study

This study has been conducted to assess compliance of patients with CABG with therapeutic regimen, and the factors affecting their compliance. It is essential for such a group of patients to comply with the prescribed regimen to prevent complications and to save their life.

From the clinical experience and observation for the actual situation, it is obvious that patients with

CABG not comply to therapeutic regimen; drug regimen, prescribed diet, precautions of wound care, performance of suitable physical exercise, follow up precautions to avoid complications, they always readmitted to hospital with complications such as vein graft occlusion, recurrent myocardial infarction (MI), sternum nonunion, drugs side effect, social and psychological problems or sudden cardiac arrest.

On other hand, patients with CABG are suffering from difficulties to be compliant that contribute to diminish quality of life, increase morbidity and mortality. Because the compliance is a complex behavioral process that is strongly influenced by the environments in which patients live, the patient's social and cultural background, healthcare providers and healthcare system. The nurses are in a unique position therefore, one of the important duties of them to assess factors that influence patients' compliance and to develop interventions that will enhance their adherence to the prescribed regimen taking into consideration those factors.

2.Subjects and Methods

Aim of the study:

The present study is aiming to:

1. Assess compliance of patients with CABG.
2. Assess the factors affecting compliance to therapeutic regimen among patients with CABG
3. Guidelines for patients with CABG according to their needs.

• Research questions:

1. To what extent is the patient with CABG compliant with therapeutic regimen?
2. What are the factors affecting compliance among patients with CABG?
3. Are the guidelines quite enough for patients with CABG according to their needs?

1. Technical Design:

The technical design includes; study design; setting, subjects, and tools used in the study.

Study design:

A descriptive exploratory design was utilized to meet the aim of the study.

Setting:

The study was conducted in the Outpatient Clinics of Cardiology at el- khames military Hospital.

Subjects:

A purposive sample of one hundred (100) adult patients with CABG from both genders who were admitted in the previously mentioned setting within two months duration from December 2013 until February 2013 were recruited in the study.

Study tools:

An interview questionnaire sheet consists of two parts:

First part (Appendix I):

This part was developed by the researcher, based on review of recent literature³⁰ & ³⁹ and concerned with socio-demographic characteristics of patients under study & factors affecting their compliance.

Socio-demographic data that include patient's age, gender, occupation, marital status and level of education. Also, it includes past and present history of disease and health education.

- Physical factors had 3 items (presence of physical problems, use of visual aids and hearing devices, answer was Yes/ No)

Social factors had 4 items (effect of disease on work, home, family and family support, answer was Yes/ No)

- Psychological factors had 5 items (presence of insomnia, feeling of crying, shame on front of others, feel low self esteem, anxiety and depression, answer was never/ rarely /sometimes/ often! always)

- Patients' believes had 6 items (difficulties to be compliant, compliance leads to dependence on others, restrict and change life style, disease affects physical and psychological status, trust In medical information, effect of relation between patient and physician & family, and presence of problems in follow-up, answer was Yes No.)

The second part (Appendix 11):

The second part is concerned with patients' compliance about therapeutic regimen. This part is quoted from **Mohamed, H.M. 2002& Mersal, N.A. 2006** and modified by the researcher, which includes:

1. Patients' compliance toward drugs regimen

It had 7 items (taking drugs on time, taking prescribed doses, taking drugs without consultation, comply with medication when feel better, stopping medication due to side effect, taking the same drugs even in presence of exchanges, and taking exchanged drugs).

Scoring System

Each item of the patient's compliance toward drugs regimen has score as:(0) points Never take, (1) points rarely take, (2) points sometimes take, (3) points often take, and (4) points always take.

The total score ranged from zero to 28 points, which IS divided into two categories as follows:

- (0 - 22) was graded as non- Compliant.
- (23~28) was graded as Compliant.

2. Patients' compliance toward prescribed diet

It had 13 items (taking meals on time, taking small frequent meals, low salt in diet, avoid eating pickles, add salt alternatives, avoid eating preserved food, eating boiled and grilled food, use corn oil in cooking, low food rich in cholesterol, taking white-meat instead of red-meat, decrease fats in diet, eating

vegetables regularly with the same amount, eating fresh fruits).

Each item of the patient's compliance toward prescribed diet has score as (0) points never take, (1) points rarely take, (2) points sometimes take, (3) points often take, and (4) points always take.

The total score ranged from zero to 52 points, which is divided into two categories as follows:

- (0 - 41) was graded as non- Compliant.
- (42-52) was graded as Compliant.

3. Patients' compliance toward precautions of wound care

It had 3 items (support wound with pillow during cough, follow precautions to care of wound during shower, and use arms to raise weight more than 5 kg).

Scoring System

Each item of the patient's compliance toward precautions of wound care has score as: (0) points Never follow, (1) points rarely follow, (2) points sometimes follow, (3) points often follow, and (4) points always follow, for items (support wound with billow during cough, follow precautions to care of wound during shower).

The total score ranged from zero to 12 points, which is divided into two categories as follows:

- (0 - 9) was graded as non- Compliant.
- (10-12) was graded as Compliant.

4. Patients' compliance toward performed suitable physical exercise

It had 7 items (increase physical exertion gradually, ascend stairs rest when tired, practice walking daily, had problems during movement, work type more than limits, practice arms exercises, and practice neck exercises)

Scoring System

Each item of the patient's compliance toward performed suitable physical exercise, has score as (0) points never practice, (1) points rarely practice, (2) points sometimes practice, (3) points often practice, and (4) points always practice.

The total score ranged from zero to 28 point; which IS divided into two categories as follows:

- (0 - 22) was graded as non- Compliant.
- (23-28) was graded as Compliant.

5. Patients' compliance toward follow up regimen

It had 3 items (take care of follow up times, go to the physician in case of signs & symptoms suddenly appeared, perform prothrombin test on time)

Scoring System

Each item of the patient's compliance toward follow-up regimen has score as (0) points never follow-up regimen, (1) points rarely follow-up regimen, (2) points sometimes follow-up regimen, (3)

points often follow-up regimen, and (4) points always follow-up regimen.

The total score ranged from zero to 12 points, which is divided into two categories as follows:

- (0 - 9) was graded as non- Compliant.
- (10-12) was graded as Compliant.

6. Patients' compliance toward precautions to avoid complications

It had 12 items (wash teeth twice/day, use soft brush, change the teeth brush, perform routine visit to dentist, notice blood after washing teeth, Use electric razor &/or use a razor of another person" **for men**", notice quantity of blood during menstruation according to number of pads" **for women**, avoid walking with bare foot, examine skin in presence of red or blue spot, investigate urine or stool for blood, go to physician in case of hypothermia) the men had 11 items and women had 10 items.

Scoring System

Each item of the patient's compliance toward precautions to avoid complications has score as (0) points never follow, (1) points rarely follow, (2) points sometimes follow, (3) points often follow, and (4) points always follow for all items.

The total score of patient's compliance toward precautions to avoid complications (44) points for men (40) points for women, which is divided into two categories as follows:

For men

- (0 - 35) was graded as non- Compliant.
- (36- 44) was graded as compliant.

For women

- (0 - 31) was graded as non-compliant.
- (32 - 40) was graded as compliant.

The overall patients' compliance is divided into two categories:

The total score ranged from zero to 176 points, which is divided into two categories as follows:

(0-141) were graded as non-compliant (142-176) was graded as compliance

11. Operational Design: . 1.Preparatory phase:

It included reviewing of literature & theoretical knowledge of the various aspects of this issue in order to develop the data collection tool.

2. Pilot study:

A pilot study was conducted on 10 patients for testing clarity, relevance, and feasibility of conducting and estimate the time required for interview. Based on the result of pilot study, the necessary modifications and clarifications of some questions were done to have more applicable tools for data collection. Those patients were excluded from the study sample.

3.Content validity:

It was established by a panel of 10 experts who reviewed the tool for clarity, relevance,

comprehensiveness, understanding, and its applicability.

4. Field work:

Fifty adult of available patients with CABG who agreed to participate in the study in the period from December 2013 until February 2013 were included in the study. The aim of the study & component of the tool were explained to patients at the beginning of data collection. They were assured that the information collected would be treated confidentially & that it would be used only for the purpose of the study.

The researcher visited the outpatient clinic in afternoon shift from 1:00 pm to 3.00 pm for one day weekly i.e., Sunday in the period from December 2013 until February 2013. Afternoon shift was suitable for the researcher because it was easy to find the patients in the outpatient' clinic for follow-up. Each patient was interviewed individually by the researcher at a suitable place in outpatient's clinics of cardiology. Two to three patients are taken in each visit. The interview questionnaire sheet took from 40-50 min for each patient.

III. Administrative Design:

To carry out the study, the necessary approval was obtained from the hospital director of El khames military Hospital. Official letters were issued to them from the scientific research in KKU explaining the aim of study to obtain permission for the collection of data. An oral consent was taken from patients for permission to participate in research process.

IV. Statistical Design:

The collected data were tabulated & statistically analyzed using SPSS version 10 to evaluate the patients under the study. The statistical analysis included percentage (%), mean, standard deviation (SD), range, and Chi-square (X^2).

The observed differences, associated were considered as follow:

(NS)	$P > 0.05$	Not significant
(S)		Significant $P < 0.05$
(HS)	$P < 0.01$	Highly Significant
	$P < 0.001$	Very highly significant

Limitations of the study:

There were some subjects who left the study because they refuse to continue questionnaire or due to traveling, those subjects were replaced by other subjects.

3.Result:

Part I: Socio- demographic characteristics of patients and factors affecting their compliance:

Table (1): Socio-demographic characteristics of patients with coronary artery bypass graft.

Items	%	(N=(100))
Age group (years):		
20- < 30	20	20
30 <40	27	27
40 <50	26	26
50 and over	27	27
Mean±SD		41.9±11.75
Gender:		
Male	49	49
Female	51	51
Residence:		
Urban	37	37
Rural	63	63

Education:		
illiterate	33	33
Read/write	18	18
Primary/secondary	41	41
University	8	8
Occupation:		
Private work	28	28
Government work	19	19
Unemployed	53	53
Marital status:		
Single	12	12
Married	73	73
Widow	14	14
Divorced	1	1

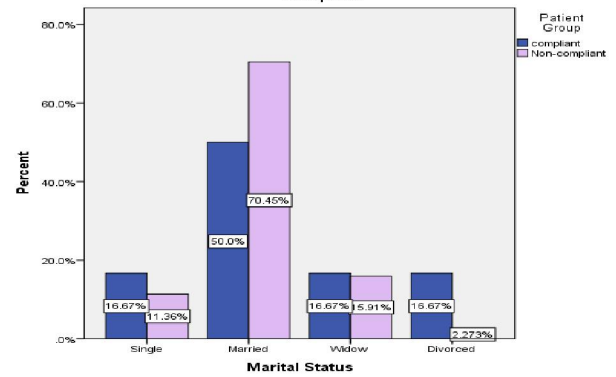
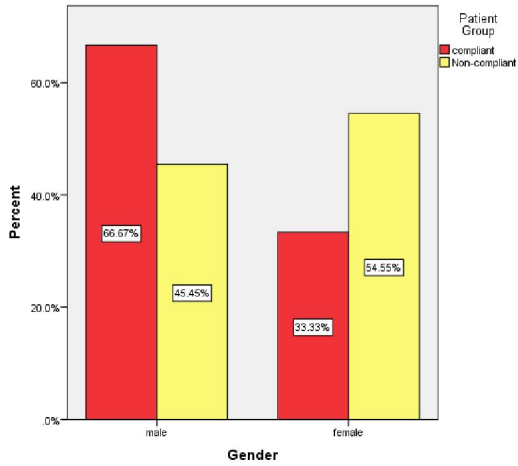
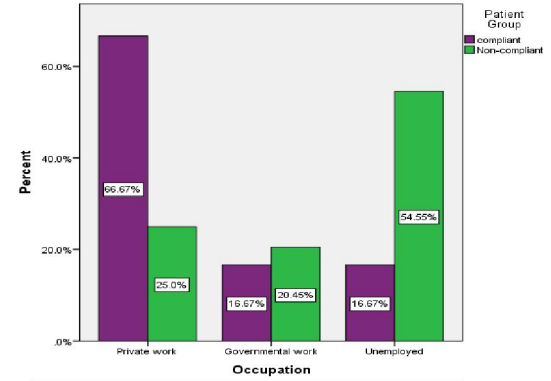
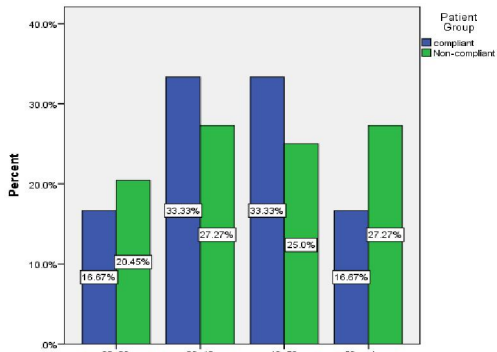
Table (2): Relation between overall patients' compliance & their past history.

p. value	X ²	Non Compliant (N=88)		Compliant (N=12)		items
		%	No	%	No	
0.01"	6.41	91.7	87	100	12	Coronary artery disease:
		8.3	1	0	0	Yes No
0.012"	6.36	75.7	62	100	12	Hypertension:
		24.3	26	0	0	Yes No
0.013"	6.32	37.5	33	100	12	Angina:
		62.5	55	0	0	Yes No
0.03**	4.135	22.8	20	16.7	2	Rheumatic fever:
		77.2	68	83.3	10	Yes No
0.01"	4.80	4.6	4	0	0	Congenital heart anomalies:
		95.4	84	100	12	Yes No
0.038"	4.33	60.2	53	25	3	! Stroke:
		39.8	35	75	9	Yes No
0.045"	4.003	20.5	18	8.3	1	: Diabetes mellitus:
		79.5	70	91.7	11	Yes No
0.013"	6.52	3.4	3	0	0	Psychological tension:
		96.6	85	100	12	Yes No
0.01"	4.80	4.6	4	0	0	Lung diseases:
		95.4	84	100	12	Yes No
0.013"	6.52	3.4	3	0	0	Hepatic disease & viruses:
		96.6	85	100	12	Yes No

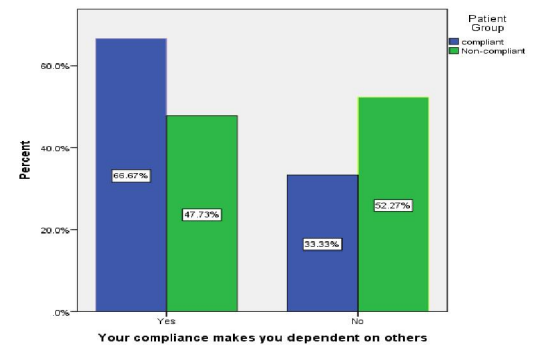
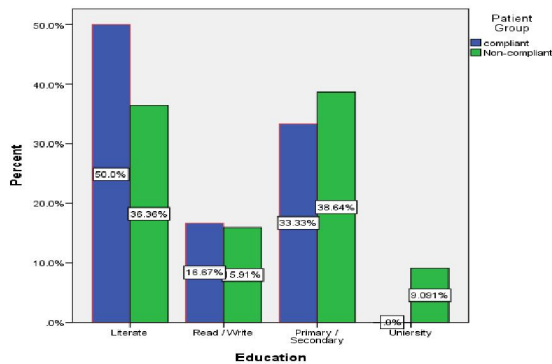
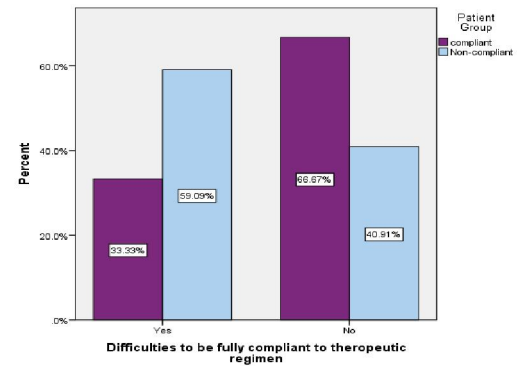
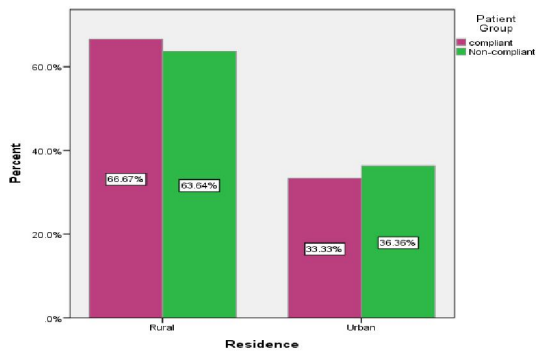
$p > 0.05$ Not significant, $P < 0.05$ Significant, $P < 0.01$ Highly Significant, $P < 0.001$ Very highly significant

Part II: Relation between overall patients' compliance and factors affecting their compliance

Table (3): Relation between overall patients' compliance and socio-demographic characteristics.



Relation between overall patients' compliance & their past history.



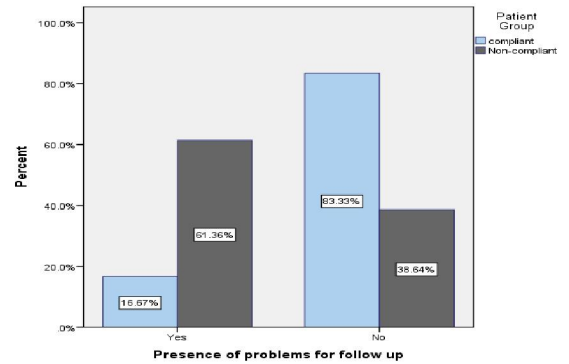
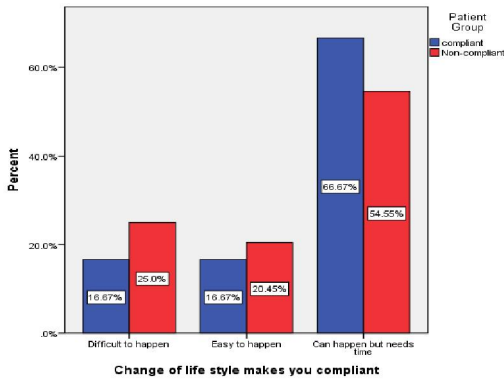
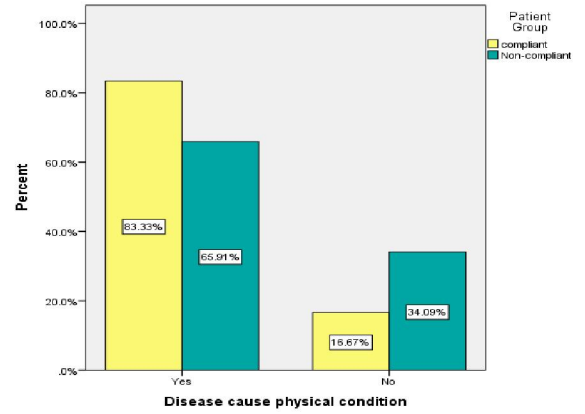
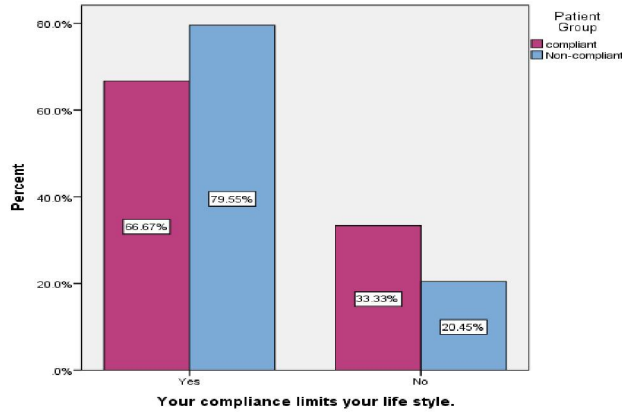


Table (4): Relation between overall patients' compliance and social factors.

p. value	X ²	Non-compliant (N=88)		Compliant (N=12)		Items
		%	No	%	No	
0.042*	4.135	52.3	46	83.3	10	Disease causes problems at work Yes No
		47.7	42	16.7	2	
0.045*	4.003	52.5	47	91.7	11	Disease causes problems at home Yes No
		47.5	41	8.3	1	
0.042*	4.135	48.3	43	83.3	10	Disease effects family Members Yes No
		51.7	45	16.7	2	
0.038*	4.306	72.7	60	100	12	Family support in health Problems Yes No
		27.3	28	0	0	

P>D.OS Not significant, P<O.OS Significant., P< O.OI Highly Significant, P <O.OOI Very highly significant

Table (5): Relation between overall patients' compliance and their physical factors.

<i>p. value</i>	X^2	Non-compliant (N=88)		Compliant (N=12)		Items
		%	No	%	No	
0.045*	4.003	62.5	55	91.7	11	Have physical problems
		37.5	33	8.3	1	Yes No
0.194	1.685	12.5	11	0	0	Eye impairment
		87.5	77	100	12	Yes No
0.598	0.278	2.3	2	0	0	Hearing impairment
		97.7	86	100	12	Yes No

$P > 0.05$ Not significant, $P < 0.05$ Significant, $P < 0.01$ Highly Significant, $P < 0.001$ Very highly significant

Table (6): Relation between overall patients' compliance and psychological depression

<i>p. value</i>	X^2	Non-compliant (N=88)		Compliant (N=12)		Items
		%	No	%	No	
0.016*	12.223	6.81	6	16.66	2	Psychological Depression
		41.67	5	0	0	Never
		41.67	5	0	0	Rarely
		25	22	16.66	2	Sometimes
						Often
		63.6	56	16.66	2	Always

$P > 0.05$ Not significant, $P < 0.05$ Significant, $P < 0.01$ Highly Significant, $P < 0.001$ Very highly significant

Table (7): Relation between overall patients' compliance and smoking.

<i>p. value</i>	X^2	Non-Compliant (N=88)		Compliant (N=12)		Items
		%	No	%	No	
0.241	2.849	5	5	1	2	Patient's smoking
		7		6		Smokers
		23.8	21	33.3	4	Previous smokers
		70.5	62	50	6	Non smokers

$P > 0.05$ Not significant, $P < 0.05$ Significant, $P < 0.01$ Highly Significant, $P < 0.001$ Very highly significant

This table shows that, there is no statistically significant relation between overall patients' compliance and smoking ($X^2=2.849$ at $P > 0.05$).

Table (8-a): Relation between overall patients' compliance and their believes.

p. value	X ²	Non-Compliant (N=88)		Compliant (N=12)		Items
		%	No	%	No	
0.223	1.484	76.1	67	91.7	11	Importance of therapeutic regimen Useful more than hazardous Not useful not hazardous Hazer more than useful
		23.8	21	8.3	1	
		0	0	0	0	
0.743	0.593	45.5	40	50	6	Cost of therapeutic regimen Very expensive
		50	44	50	6	Moderately expensive
		4.5	4	0	0	Less expensive
0.222	1.493	60.2	53	41.7	5	Difficulties to be fully compliant to therapeutic regimen Yes
		39.8	35	58.3	7	No
0.312	1.022	51.1	45	66.7	8	Your compliance makes you dependent on others Yes
		48.9	43	33.3	4	No
0.644	0.213	80.7	71	75	9	Your compliance limits your life style Yes
		19.3	17	25	3	No
0.767	0.53	26.1	23	16.7	2	Change of life style makes you compliant Difficult to happen
		20.5	18	25	3	Easy to happen quickly
		53.4	47	58.3	7	Can happen but needs time
0.028*	4.807	59.1	52	91.7	11	rusting on offered knowledge Yes
		40.9	36	8.3	1	No
o.oor	8.718	77.7	49	100	12	Relation with physician affects your •• compliance Yes
		44.3	39	0	0	No

$P > 0.05$ Not significant, $P < 0.05$ Significant, $P < 0.01$ Highly Significant, $P < 0.001$ Very highly significant.

4. Discussion

As mentioned by^{15&22} compliance is one of the most important educational outcomes in patient education to judge how effective all of the teaching efforts. So, nurse should start compliance education for patients undergoing CABG from the day of their admission to the cardio-thoracic unit. It's obvious that patients' non-adherence post CABG surgery has an increasing incidence all over the world related to several predisposing factors such as physiological, social and psychological factors. So, it's an important duty of the nurse to determine factors affecting compliance to therapeutic regimen among patients undergoing CABG to enhance the outcome of CABG surgery.

Therefore, the present study has been designed aiming to first: assess compliance of patients with CABG, second: assess the factors affecting compliance to therapeutic regimen among patients with CABG. Discussion of the findings of this study will cover the main areas of socio-demographic characteristics, patients' compliance about therapeutic regimen and factors affecting their compliance.

Regarding the socio-demographic characteristics for patients In the study results revealed that, the age of the patients ranged from 30 to 50 years. This finding was supported by reports of^{3& 10} stating that the CAD is more common in persons whose age range from 40 to 55 years.

As regard to gender, the result showed that the male and female patients with CABG under study were

approximately equal. This indicates that both men and women are liable to experience this surgical procedure. This finding is in contrast with ¹who found that the percentage of female patients undergoing CABG was higher than the percentage of male patients. In addition ⁵ emphasized that, women appear to be at increased risk for CAD, re-infraction, and death are more than men because the risk of women increases significantly at menopause, as the CAD rates in women after menopause are two to three times more than of women before menopause.

Regarding marital status, the present study illustrated that, the majority of the patients were married. In my opinion the married people were more liable to CAD more than single related to social and psychological stress of the family which faces them. This finding goes in the same line with ⁴ & ¹⁵ who found that married patients who have CAD represent the higher percentage of their study subject than single and widow patients.

Regarding to residence, the current study revealed that about two thirds of the subjects are from rural areas. This may be due to such a group of patients at high risk for developing CAD due to following unhealthy food habits such as eating diet includes high salt & fat, or lack of medical care. This result was consistent with the result of ³⁰ who found that geographic location affects the incidence of the cardiovascular diseases and patients' residing in rural area have the highest risk. Also, the findings were consistent with ² who found that the geographic location affects the patients' follow up plan. Whereas the patients' residing near the health care settings comply with follow-up plans than those residences living far from health care settings.

Although it's well known that cigarette smoking is the most important leading cause of CAD as reported by **Cardiology Channel (2006)& Patterson, B.; Thorne, S. and Dewis, M. (2005)**, in this study, the result revealed that, only about one third of male patients were smokers.

Table (8-b): Relation between overall patients' compliance and their believes.

p. value	X ²	Non-compliant (N=88)		Compliant (N=12)		Items
		%	No	%	No	
0.038*	4.306	65.9	58	0	0	Disease causes psychological Depression Yes No
0.225	1.473	65.9	58	83.3	10	Disease affects physical Condition Yes No
0.038*	4.306	72.7	64	100	12	Family supports his compliance Yes No
0.003**	8.562	38.6	54	16.7	2	Presence of problems for follow up Yes No
0.646	1.658	73.9	65	58.3	7	Signs and symptoms after Surgery Decreased after surgery Increased after surgery As it is Not present
		5.7	5	8.3	1	
		7.9	7	8.3	1	
		12.5	11	25	3	

$P > 0.05$ Not significant, $P < 0.05$ Significant, $P < 0.01$ Highly Significant, $P < 0.001$ Very highly significant

The current study findings could be attributed to physicians' recommendations to stop smoking and the frequent health education campaigns in the mass

media about its effects and problems on body health as stated by the patients themselves. Also it may be due to more than half of patients were females and

they are non-smokers. While, these findings are inconsistent with **Carrier, M., and Harrington, R.A, (2008)**, whose study revealed that the majority of CAD patients were smokers.

The first aim of this study was to assess the patients' compliance about therapeutic regimen including; drug regimen, prescribed diet, precautions of wound care, performance of suitable physical exercise, follow-up regimen and precautions to avoid complications. The result revealed that, though of the majority of patients in the study had a belief regarding the importance of therapeutic regimen; only few patients had total compliance. This could be attributed to the lack of their knowledge regarding the therapeutic regimen. This result is inconsistent with ³⁸ who found that patients' compliance increases when they have a belief about the importance of the therapeutic regimen. As well as ⁴¹ stated that, the patients who adhere to their regimen have better outcomes of living longer, enjoying a higher quality of life and suffering fewer symptoms than those who don't.

As regard to past history of patients under study the finding revealed that more than three quarters of patients had hypertension this result was consistent with ¹⁷ who stated that hypertension is a major risk factor for development of all forms of cardiovascular disease, exerting a similar effect as a risk factor in women and men. Hypertension is also an important risk factor for death and ischemic events after presentation with acute coronary syndromes (ACS). Also, the current study revealed that, more than half of patients had strokes this result was consistent with ⁴⁵ who reported that, patients after strokes have a high prevalence of a symptomatic CAD, cardiovascular co-morbidity which may contribute to complications in the treatment and the course of illness to a limited recovery of function and even to early morbidity.

Also, the current study revealed that, about one third of patients had diabetes mellitus, this could be attributed to incidence of CAD is much higher in person with diabetes mellitus even those with well controlled blood sugar than in general population. This is supported by ³⁶

As regard to relation between past history and patients' compliance with therapeutic regimen the study revealed that there is a significant relation between past medical illness and patients' compliance with therapeutic regimen. Whereas patients with multiple medical illness (rheumatic fever, congenital heart anomalies, diabetes mellitus, lung & liver disease) were not compliant with therapeutic regimen than those without past illness. This might be due to compliance is poorer in patients with multiple medical illness which requires continuous follow-up, more medical restrictions, financial cost, multiple

drug doses and life-style change than those without other past illness. This is supported by ³⁷ who found that patients with past illness such as diabetes mellitus and another chronic illness had unsatisfactory level of adhering with their therapeutic regimen.

Also, the most important finding of this study is that, although all the compliant patients reported that they have other medical illness such as CAD, angina & hypertension as risk factors they were compliant. This may be due to the fact that medical illness of compliant patients increases their recognition about importance of following their therapeutic regimen to avoid cardiovascular complication and recurrent hospital admission.

As regard to the common physical factors that hinder patients' compliance with therapeutic regimen the study revealed that more than two thirds of patients reported that they have physical problems such as dyspnea, chest pain & fatigue. These symptomatic problems may be due to effect of disease or drug side effect. Also, there was a significant relation between physical problems and patients' compliance with therapeutic regimen and that the most important finding of this study was, although the majority of compliant patients reported that they had physical or symptomatic problems they were compliant. This may be because they want to manage these symptomatic problems, improve their physical status, live normal life or avoid recurrent hospital admission. This is supported by ¹⁹ who found that there is significant relation between patients' physical status and their compliance with treatment.

As regard to the common social factors that hinder patients' compliance with therapeutic regimen, the current study revealed that more than half of patients reported that they had home and work problems that hinder their compliance. This may be related to the high cost of medication that they received which needs more money. Also the irregular attendance in work resulting from effect of the disease on their physical condition leads to decreasing their income, decreasing social interaction and isolation. Also, there was a significant relation between social factors and patients' compliance with therapeutic regimen. The most important finding of this study was although the majority of compliant patients reported that disease causes problem at work, home & family, they were compliant. This result may be as they want to improve their life-style, avoid disease complication especially in front of people or in work, improve financial and social activity. This result is supported by ⁹ who found that financial support for patients improved their compliance. This is also similar to ³⁰ who found that a patient who has

insufficient income or health insurance has very limited compliance.

The study finding is also congruent with what was stated by ⁷ who found that drug costs also provide another barrier to adherence with drug therapy, also the high cost of drug acquisition can be an obstacle to adherence as reported by half of patients under study.

In relation to social factors and patients' compliance the current study revealed that, there was significant relation between family support and patients' compliance. In my opinion; family support is the most important factors to improve patients' compliance as they encourage patient to accept his/her disease, cope with disease complications, and improve their psychological status. According to Virginia Henderson's nursing theory: person has to love, belongs and to feel safe. This safety comes first from family. This finding is supported by ³³, who reported that patients with weak support from their families and friends are more likely to be non-compliant than patients who have strong support, and are more likely to show positive self-care behaviors. Also, findings are supported by **Hawthorne, M. and Hixon, E. (2004) & Nelson- Jones, K. (2002)** who identified that social interaction and activities may be altered as a result of the disease, and added that social isolation is one of the more common effects of the disease. With reference to psychological factors that hinder patients' compliance with therapeutic regimen the current study revealed that, half of patients mentioned that they had low self-esteem after the disease. This could be attributed to the effect or disease, operation, recurrent attack of disease, easily fatigability, fear of death, change of patient's role in work & family which consequently affect their compliance. This finding is supported by ²⁰ who stated that low-self-esteem, and low self-confidence is the most psychological factors affecting patient's adherence.

Regarding feeling of fear, the current study revealed that about half of patients were feeling afraid mainly from being dependent on others or progress of illness and fear of death. This may be due to intensity of the disease and its consequence on physical and psychological status. Fear of death expressed was by some patients in statement "that they are afraid to go to sleep at night for fear they would not be awake". In my opinion; feeling of fear is considered the most common problem for the cardiovascular patients, they fear to do activity. Also, they even fear from any chest pain even it may be related to other organ not related to heart. They always mentioned that "they suffered from a horrible pain, if they have this pain again, they will die so they are always in panic, always avoid any source

that may cause this pain or increase heart effort. This finding is supported by ²² who examined the effect of chronic illness on the emotional state of the study subjects.

Moreover, the current study revealed that, more than half of patients in the study reported the presence of anxiety and worry about physical condition, and had depression. This may be due to recurrent attacks of chest pain, long term follow-up, and financial burden including high cost drugs followed by worsening of health status, this finding is supported by the findings **Gulanick, M.; Klopp, A. and Galanes, S. (2003)**; who found the same results. Also, ⁶ mentioned that, CAD patients have been shown to have high level of anxiety due to recurrent attacks of chest pain. In the same line ¹⁶ reported that, anxiety was the most frequently reported emotions accompanying the physical problems and worsening of health status experienced by subjects with CAD.

In relation to psychological factors and patients' compliance with therapeutic regimen; the study revealed that there was a significant relation between them. Whereas about two thirds of non-compliant patients always had psychological depression hinders them to be compliant, this could be attributed to the psychological depression affects their psychological status and consequently on their compliance. This result is supported with ³², who reported that CAD patients are more depressed than normal population. Also the finding of this study is congruent with what was found by ⁸, that chronic illness induces social isolation and leads to depression.

Regarding patients' beliefs about compliance to therapeutic regimen, the finding of the study revealed that, majority of patients consider that the therapeutic regimen is useful more than hazard but needs time to happen, and more than half of patients consider compliance to therapeutic regimen is too difficult to follow. This could be attributed to the restrictions of the therapeutic regimen after CABG surgery such as diet restrictions, long term of follow-up & restricted exercises. This is as similar as ⁴⁰ who found that the subjects' opinion about therapeutic regimen was intensive, sophisticated, and has many complex restrictions over a long period.

Also, the result of present study revealed that the majority of patients mentioned that compliance leads to change of life-style & dependent on others. This is may be as the compliance requires the patients to be active and to collaborate with health care professionals when setting goals for their treatment and defining the methods by which those goals can be achieved. Patients should change their life-style and make the treatment a part of their lives. This finding is supported by ⁴¹ who mentioned that compliance is probably poorer in diseases which

require change of life-style than in those that don't require any such action. Also the finding of this study is congruent with what was found by ²⁰ who found that patients fear from dependent on others which affects them to be compliant with their therapeutic regimen.

This result also was consistent with, ¹⁸ who stated that medical factors include the regimenduration, regimen complexity (e.g. number and frequency of medications taken & extent of lifestyle changes required), financial cost of the therapy and unwanted adverse drug reactions are one of the most barriers to compliance. Also, ²⁷ added that, aspect of disease process influences the patient's commitment to the treatment regimen as the nature of the disease (Acute or chronic, in early stage or late stage, symptoms present).

In relation to overall patients' compliance and their beliefs regarding therapeutic regimen; the study revealed that there was a significant relation whereas the beliefs of compliant patients regarding trusting on the offered knowledge, relation with physician and family support help them to be compliant. While beliefs of non-compliant patients regarding the disease causes psychological depression and presence of problems on follow-up affect their compliance. This finding confirmed that the beliefs of patients regarding their therapeutic regimen affect their compliance. This finding is supported by ²⁴ & ⁵ who found that patients beliefs about their disease condition and their therapeutic regimen have an affect improving their coping with and adaptation to post CABG.

Also, the result of the current study revealed that more than two thirds of patients mentioned that the relation with their physician effects on their compliance, this finding is supported by ¹², who mentioned that client provider relationship is the major factor in the client's adherence to both regimens and therapeutic compliance treatment. This was also consistent with ³⁸, who stated that, compliance is a part of supporting relationship between health care providers and the patients.

Finally, the result of the present study revealed that There was a statistically significance relation between overall patients' compliance & their information about therapeutic regimen including; post-operative complication & how to avoid it, side effect of drugs & how to deal with it, care of wound during bathing, healthy diet, possible complication & how to discover it, and avoiding infection. In my opinion; knowledge is the most important strategy that enhances adherence of the therapeutic regimen through many different ways such as; informing patients with sufficient knowledge about therapeutic

regimen, goals or treatment, and ensure that the patient acts in a way that improves the therapeutic regimen. This is consistent with ²⁹ who stated that the basic purpose of teaching & counseling is to help patients to develop the self-care abilities that enable them to maximize their compliance and quality of life.

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