Assessment of Health Behaviors of a Group of Myocardial Infarction Patients Admitted To Teaching Hospitals In Erbil City

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Abstract

Background: Coronary arteries diseases and the ensuing myocardial infarction are among the most common causes of death in human beings in many countries around the world including Iraq. Changing health behaviors such as balancing the diet, having regular exercises, quit smoking, and stopping alcohol intake are among the solutions for preventing, caring, curing and returning the patient to the physical, mental and social status he/she had before being afflicted by the disease.

The aim of this study is to assess health behaviors of MI patients after recurrent MI attack.

Subject and Methods: it is a hospital based cross-sectional study, conducted in Erbil city involved three hundred patients that had recurrent MI attack. Data are collected from 1st of July 2011 to 30th of January 2012, by using questionnaire through direct interview.

Statistical analysis: Statistical package for social sciences (SPSS) version 18 was used for data entry and analysis.

Results: The non smoker rate increased from 72.3% before MI to 89.7% after MI. There was little change in those that take alcohol before and after MI events (before MI 6.7%; after MI 5.3%). There was no significant change in number of those that did exercise (before MI 7.3%; after MI 9%).There was a significant change in food control behavior after MI event (11% before MI increased to 67.7% of patients that adopted a controlled food behavior after MI). And majority of patients have unhealthy body mass index.

Conclusion: Results provide important new information on health behavior changes among those with chronic disease (MI) and suggest that intensive efforts are required to help initiate and maintain lifestyle improvements among this population

Key words: MI, behavior, exercise, alcohol, food, BMI

1.Introduction

1.1 Acute MI (myocardial infarction) is a clinical Syndrome that results from an injury to Myocardial Tissue that is caused by an imbalance between Myocardial Oxygen supply and demand. Each year roughly 1.1 million people experience MI in the United States; even more, 6 million, are admitted for consideration of this diagnosis, and approximately 460,000 succumb to Coronary-artery-related deaths. [1]

Cardiovascular disease (CVD) is common in the general population, affecting the majority of adults past the age of 60 years. The prevalence of coronary heart disease (CHD) is approximately one-third to one-half that of total CVD.[2] Every year approximately 17 million people die from CVD.[3] However, morbidity and mortality from CVD could be greatly reduced through interventions and policies that target and managed its risk factors. [4] Reducing blood pressure and serum cholesterol can, indeed, effectively prevent or delay CV events. [5] Total CV risk factor management has been advocated for several years as an alternative approach.[6,7], and posits that the higher an individual's total CV risk before treatment is initiated, the greater the cost-effectiveness of treatment. [5,6]

1.2 A large part of population at risk can be identified by assessing their behavior. CVD is strongly related to life- style characteristics and associated risk factors. [8]

Cigarette smoking is considered to be responsible for 50% of all avoidable deaths in the industrialized world.[9]

Smoking cessation is more effective than any other medical regimen or modality for
secondary prevention of CHD.[10]

A review of lifestyle recommendations for patients with coronary arterial disease (CAD) estimated a 20%
reduction in mortality with moderate alcohol use. On the other hand, drinking more than three drinks a day has a
direct toxic effect on the heart. Heavy drinking puts more fat into the circulation in the body, raising triglyceride
level.[11]

Physical activity for at least 30 minutes daily can largely eliminate coronary heart disease(CHD) in individuals
70 years of age and younger.[12]

Certain dietary recommendations (e.g., Mediterranean diet) and exercise have also been shown to be effective in
the secondary prevention of coronary heart disease.[13,14]

1.3 Furthermore, due to the impact of CHD on public health and the escalating cost of health care, Strategies for
promote health behaviors (Smoking cessation, Regular exercise, control of diet,..etc) are becoming increasingly
important for Erbil city, and research on this subject had not been conducted yet in Erbil city which is located at
north of Iraq .

 The aims of this study are
   (1) Assess the health behavior (smoking, alcohol consumption, food intake and exercise) before MI event.
   (2) To study socio-demographic characters of MI patients
   (3) To evaluate the modification of patients health behavior post MI event and its significance changes
        before disease onset.

2. Methodology

2.1 study design: Hospital based cross-sectional study; was carried out in Erbil city.

2.2 setting: the study was done in Erbil city in Teaching Hospitals (Rizgary Teaching Hospital and Hawler
Teaching Hospital).

2.3duration: Collection of data was conducted over a period of six months from 1st of July 2011 to 30th of January
2012. Teaching Hospitals in Erbil city (Rizgary Teaching Hospital and Hawler Teaching Hospital).
2.4 sample: the sample size of this study was included 300 patients which is convenient sample, and all participant
patients were involved in this study having recurrence MI. This study will be carried out on patients of all age
groups and both Gender.

2.4.1The inclusion criteria; all recurrence MI of all age group and both male and female patients.
2.4.2 Exclusion Criteria; all patients with 1st MI attack and other heart related diseases.
2.5 ethical considerations: the study approved by ethical and scientific committee of the college of Hawler
Medical University and facilitation latter from Erbil Directorate Of Health was obtained with complete
confidentiality was guaranteed to the participants were no name contain.

➢ **2.6 data collection**: The closed-ended questionnaire was designed by the researcher and approved by
   supervisor which include general socio-demographic information such as name, phone number, age in years,
   sex, marital state, religion, address, ethnicity, family income, home ownership, possession of car, number of
   household members, number of rooms occupied by household members, crowding index, was calculated by
   dividing the number of households by the number of rooms (except kitchen and bathrooms) . [15]., years of
   formal education of patients and occupation. Body mass index (BMI) Body mass index (BMI): A key index for
   relating a person's body weight to their height. The BMI is a person's weight in kilograms (kg) divided by their
   height in meters (m) squared (BMI=Kg/m^2). And BMI can be classified as: Normal (18.5-24.9), Overweight
   (25.0-29.9), Moderate obese (30.0-34.9) Sever obese (35.0-39.9) and Very severs obese (≥40.0). [16]

. Past medical disease of patients and family history of disease.

The questionnaire included questions related to four important health behaviours as fallows;
Smoking history included, before and after the disease, Smoking behavior before the MI Incidence (current, former,
and nonsmoker)
Smoking Behavior after the MI Incidence (Quitter smokers, Persistent, Relapse smokers). [17]: history of Exercise
(regularity and duration).
Diet history included, assessment by asking the patients about dietary regime and which type of food more likely in
his regime, we divide the food into two group. (1) Fish, fowl, vegetables, and grain. (2) Meat fat, dairy fat, and

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other sources of dangerous types of fat, like tropical oils. And also ask about control of food before and after MI events.

Alcohol history included; Alcohol was assessed by question about alcohol intake before and after MI, (frequency, duration, type).

2.7 The statistical analysis: was done by using SPSS version 18 was used to reveal frequencies and association of different variables collected during the period of the study. Chi-square (X^2) test of association. A P-value of ≤ 0.05 was considered as statistically significant. Mc Nemar's test was used to see association of health behavior before and after MI events. McNemar's test is a non-parametric test that is used to compare two population proportions that are related or correlated to each other. This test is also used when we analyze a study where subjects are tested before and after time periods. [18]

3. Results and discussion:

3.1 There is evidence that changes in life styles- especially stopping cigarette smoking, dietary change and increasing physical activity level- in patients with established CHD are likely to reduce risks both of recurrent CHD and possibly the occurrence of other vascular events, particularly stroke. These changes may also have other beneficial effects, including reducing the risk of other non-cardiovascular diseases and reducing the need for medication or the medication dose required. [19]

In Iraq, the mortality rate (from, top ten causes of death from all age groups at 2002) cardiovascular death accounts for about 16 %(Ischemic heart disease of 10%, Cerebrovascular disease of 4% and Hypertensive disease of 2%) of all death. [20] Cardiovascular registry system is so important; the lack of such system makes it difficult to plan properly for prevention, treatment and research. Lack of adequate data on cardiovascular diseases was a concern addressed quite often. The main challenge for developing countries is incomplete and inaccurate report and collecting data . [21,22]

3.1 Socio-demographic characteristics of studied sample

Over all 300 patients with recurrence MI were interviewed , from two Erbil teaching hospital (Rezgary and Erbil teaching hospital), the patients were distributed according to their age, place of residence, marital status, occupation of patients, family income, possession of car, type of housing, crowding index and educational level of patients.

3.1.1 Demographic characteristics of studied sample

The age range was 35-87year, the mean age 63.79 years (SD ±10.99). The majority (34%) of the patients from age group 60-69 years while the minimum proportion (11.6%) from age group those less than 50 years. Male patients represented 51.7% of the participants, while female patients represented 48.3%. The majority (60.3 %) of patients lives in urban area, and 75.3% married. Vast majority (95%) of them were Kurd-ethnicity as shown in Table 3.1.

Socio-economic status of studied sample

Table 3.2 shows a list of included socioeconomic criteria and the distribution of the patients by each of these indicators. Regarding respondent education level, the highest percentage (72.7%) of respondents, were illiterates, while the lowest percentage (2%) of respondents had diploma, university and higher education.

Regarding crowding index (53%) of patients had crowding index range from (1.6-2.5), (65.7%) of families had their own car, on the other hand (78.7%) of families' lives in their own houses. And (67.7%) had enough income.

3.2 Past medical disease and family history of disease of studied sample

Concerning past medical disease of patients; 42.7% of patients had previous history of hypertension, 27.7% of patients had history of DM and 2.7% had history of CVA before MI events as shows in Fig.1.

Regarding past medical disease of patients, Hypertension history was present in 42.7% of MI patients and it's nearly parallel to result of a study that conducted in Pakistan (Karachi) 43.3% [23] and it's less than results from study that conducted in Palestine (Nablus) which was 78%.[24]The prevalence of DM was 27.7% and it's also consistent with a result of a study in Pakistan (Karachi) [23] which was 27.4% and it's less than result of study that conducted in Palestine (Nablus) [24]which was 65.3%.

 Regarding another past medical disease, 2.7% of patients had history of Cerbrovascular accident (CVA).

Regarding family history of disease in 31% of patient hypertension is positive and 17.7% have family history of IHD as shown in Fig.2. The current study reveals that 31% of patients had positive family history of hypertension, 17.7% IHD, 10% DM, and 1% have positive family history of CVA. This result was disagreed with a study that conducted in Palestine (Nablus) [24] which revealed 67.33% of patients had positive family history of Hypertension, 57.3 % (DM), 52.66% (IHD), and 9.33% (CVA).

3.3 Body mass index of studied sample

Regarding BMI, highest percentage of patients (46.3%) had over weight BMI and 23.7% had normal BMI, and 27.7% of male patients and 19.3% of female patients had normal body index. Details of BMI of MI patient's are shown in Fig.3.

In this study prevalence of normal BMI was 23.7% and this study revealed that 76.3% of patients had unhealthy BMI (that include over weight, moderate obese, sever obese and very sever obese) and this result was more than result of studies that conducted in Iran (Northern Persian Gulf region) [25] which reveals 60% had unhealthy BMI, and this gap may be attributed to different in health system and access of MI patients to program of good health life style

3.4. Smoking behavior before and after MI events

Before MI:

- ✓ Non smoker's; 46.7% patients did not smoke before MI occurrence.
- ✓ Former smokers; 25.6% of all patients.
- ✓ Current smokers; 27.7% of all patients, of those current smokers (n=83), 68 were men, and 15 were women.

After MI:

- ✓ Quitter smokers; as statistical analysis revealed, comprised 62.7% of current smokers.
- ✓ Relapsed; 0% of all patients.
- ✓ Persistent smokers; 37.3 % participants continued smoking at the time of disease occurrence and then persisted after disease occurrence as shown in Table 3.3.

Furthermore, the mean number of cigarettes per day before CHD occurrence was 35.45, and this mean decreased to reach 25.94 after MI event as shown in Table 3.4.

The current study reveals that proportion of smoking habits among MI patients before 1st attack was 27.7% and this result was inconsistent (disagreement) with a study that conducted in Iran (Northern Persian Gulf region) [25] which revealed 19.0% was smoking and this may be attributed to educational program, high cost of cigarette packet in Iran than Iraq and role of mass media in Iran is more effective than Iraq. Out of those current smokers (No.=83), 81.90% were men and 18.1% were women, smoker during MI event (x^2=42.07, P<0.001).This result is similar to the result of a study that conducted in "Arab Gulf community" (Bahrain country) [26] which revealed that there is statistically significant association between smoking and gender of patients before MI event.

On the other hand, former smokers composed 25.7% of all patients and regarding non smokers (smoking based on self-report) 46.7% of patients did not smoke before MI occurrence, so at time of collecting data the total non smoker patients were 72.4%. From those 83 patients that was smoking before MI event, 61.4% of patient's become quit smoking and 37.3 % of patients continued smoking at the time of disease occurrence and continue smoking after disease occurrence, 1.2% of patients relapsed.

This study revealed that there is a statistically significant association between smoking behaviors' after MI with gender of patients (x^2=17.37, P<0.001). This result was agreed with result of study a model that done in a developing country (Jordan) [17] which at interview 32.5% were persistent smokers. Furthermore, there were a higher proportion of persistent smokers in the current study than in the study that was conducted in 15 European countries [27]during 1999–2000, which revealed that persistent smokers comprised 21% of the study sample after MI occurrence and this may be attributed to patients don't receive enough information for stopping smoking from health system and majority of patients are uneducated.

This study showed that there is statistical significant association between smoking behavior before and after MI events (Mc Nemar test, P=<0.001).

3.5 Alcohol intake before and after MI events

Regarding alcohol intake before MI, the vast majority (93.3%) of patients, that never drink alcohol, while the rate of alcohol drinker were (6.7%) of all patients, this attributed to our culture, religion, and believes. While after MI event the rate of non-alcohol intake increased to (94.7%).Data analysis revealed that there is a statistically significant association between alcohol intake behaviors' before and after MI with gender of patients (before MI x^2=12.609, P<0.001; after MI X^2= 8.69. p=0.003), and may be due to forbidden alcohol intake in our Muslim religion believes specially regarding female. And data analysis showed that there is no statistical significant association between alcohol behavior before and after MI events (Mc Nemar test, P=0.125) as shown in Table 3.5

3.6 Exercise behavior before and after MI events

As shown in Table 3.6.

92.7% of patients had no history of exercise doing before MI events, this rate was more in comparison with a study that conducted in Iran (the Northern Persian Gulf region; that was70.6%) [25], but it's parallel to results of two study that carried out in Bahrain (80 %- 94%) [26] and Palestine (Nablus) [24] which was 91.34% and this is may be attributed to that patients don't receive Intensive exercise behavior advice with drug treatment when discharged from hospital.

After MI event the percentage of patients that were physically inactive reduce to 91% but still rate is high if we compare with a result of WHO studied [28] that conducted in 10 countries after MI events which was 52.5%, and this is may be due to poor knowledge about benefits of exercise doing and also in our culture there is no enough exercise equipment and good environment for old age groups to have exercise. Although among those patients that had history of exercise doing, most of patients had history of irregular exercise. This study showed that there is significant changes between gender and exercise doing before and after MI events and this may be due to more limitation of female to doing exercise outside home in our community. However, there were no statistically significant changes between exercise behavior doing before and after MI event

3.7 Food behavior's before and after MI events.

Overall the patients, 89% of patients had no history of dietary regime before MI events, and after MI this reduces to 32.3%. , and most of patients with history of food control either before or after MI events had occasionally control on food as shown in Table 3.7.

This study revealed that only 11% of patients had history of food control (healthy food behavior) before MI event and this result was more than result of a study that done in Iran (Northern Persian Gulf region) [25] which only 8.3% had history of food control, but at same time it is less than the result of study that conducted in Palestine (Nablus) [24] which was 14.66%.

The rate of food control after MI events reaches 67.7% and it's parallel with a little bit more than result of WHO[28] study at 10 countries which revealed that 65% of patients had control of diet after MI events, this improvement in rate of diet control before and after MI events among patients may be due to insisting the profession doctor advice to their patients regarding the risk of unhealthy food like salt intake, red meat, and other hazard food

However, there were no statistically significant changes in food control behavior before and after MI event in relation with gender of patients.

This study showed that there was a statistically significant change in food control behavior before MI and after MI event and this may be due to that patients receive good information for his or her professional doctor and from other person or media.

3.8 Health behaviors before MI event in relation with gender of patients.

Regarding smoking status before MI, the highest percentage 72.3% of patients (n=300), were non smoker, while the smoker were 27.7% of patients, from those that was smoker 81.9% was male and18.1% was female patients, with significant association between gender of patients and smoking status before MI event (X^2=42.078, P<0.001).

Regarding history of alcohol intake before MI event, 6.7% of patients were alcoholic, from those 90% was male and 10% was female patients, with significant association between gender of patients and alcohol intake before MI event (X^2=12.609, P<0.001).

Regarding history of exercise before MI event 7.3% of patients had history of doing exercise, male patients was 77.3% and female patients was 22.7%, with significant association between gender of patients and exercise doing before MI event (X^2 =6.233, P=0.013).

Regarding control of food before MI event, 11% of patients had history of control food before MI event, and most of them were female patients, 39.4% was male and 60.6% was female patients, with no significant association between gender of patients and history of food control before MI events (X^2=2.236,P=0.135), as shown in Table 3.8.

3.9 Health behaviors after MI event in relation with gender of patients.

Smoking status after MI; the highest percentage (89.7%) of patients, were non smoker, while the smoker were (10.3%) of patients, from those that was smokers 87.1% were male patients and 12.9% were female patients.

Alcohol intake after MI event; 5.3% of patients were drink alcohol, from those87.5% were male and 12.5% were female patients.

Exercise behavior after MI event; 9% of patients had history of doing exercise, from those 74.1% were male and 25.9% were female patients.

 Food control behavior after MI events; 67.7% of patients had history of control of food, from those 52.2% were male and 47.8% were female patients.

Data analysis revealed that there is a statistically significant association between health behaviors'(smoking status, alcohol intake, and exercise) after MI occurrence with gender of patients, as shown in Table 3.9.

3.10 Health behavior Modification and its changes after MI events.

Data analysis revealed that there were statistically significant changes in behavior of smoking status and food control before MI occurrence and after MI event,

P <0.001.However, there was no statistically significant changes regarding alcohol intake and exercise doing before and after MI event, P >0.05. Details of health behaviors modification of patient's are shown in Table 3.10.

Conclusions:

1. Body mass index of studied sample; only 23.7% had normal BMI (27.7% of male patients and 19.3% of female patients have normal body weight).
2. Smoking behavior; before MI event was 27.7% and this rate reduces to 10.3% after MI events.
3. Alcohol behavior; before MI event 6.7% of patients were drink alcohol and rate of alcohol intake after MI event was reduced to 5.3% of patients.
4. Exercise behavior; before MI event 7.3% of patients did exercise, and this rate after MI event reach 9% of patients.
5. Food controls behavior; before MI event 11% of patients had history of control food, and after MI events increased to 67.7%.
6. Data analysis revealed that there were statistically significant changes between smoking behavior and food control before and after MI events, and there were no statistically significant changes between alcohol intake and exercise doing before and after MI event.

Recommendation

1. Intensive life style advice should be given simultaneously with drug treatment.
2. In patients with cardiovascular disease who are overweight or obese, weight loss should be advised through the combination of a reduced energy diet and increased physical activity.
3. All individuals with established MI should be strongly encouraged to stop smoking and alcohol by a health professional or if needed psychologist, and supported in their efforts to do so. Non-smoking people with MI should be advised to avoid exposure to second-hand tobacco smoke as much as possible.
4. All individuals with MI should be given advice to adopt a pattern of diet (effective diet protocol) which is likely to reduce the risk of recurrent vascular disease; this can be done cooperated with qualified dietitian.
5. Conducting educational programs through activating the role of media (TV, Radio, Magazine..ect) targeting patients and their families, this can be achieved through non government organizations(NGOs).
6. Further research is needed to examine the most effective strategies to promote uptake and adherence to comprehensive cardiac rehabilitation, the efficacy of the non exercise components of the rehabilitation programmes, and which are the most effective strategies for maintaining exercise and dietary changes.

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Table3.1. Demographic characteristics of studied sample

Variable	No.(Total =300)	%
Age groups		
< 50	35	11.67
50-59	64	21.33
60-69	102	34
≥70	99	33
Sex		
Male	155	51.7
Female	145	48.3
Address		
Rural	37	12.4
Sub urban	82	27.3
Urban	181	60.3
Religion		
Muslim	293	97.7
Christian	7	2.3
Marital state		
Single	3	1
Married	226	75.3
Divorced	2	0.7
Widowed	69	23
Ethnicity		
Kurd	285	95
other	15	5

Table 3.2 Distribution of studied sample by selected socio-economic factors

Variable	No.(Total=300)	%
0ccupation		
Employed	26	8.7
Unemployed/housewife	174	58
Free work	52	17.3
	48	16
Retired		
Home ownership		
Owned	236	78.7
Partially owned	34	11.3
	30	10
Rented		
Family income		
Enough	203	67.7
Not enough	90	30
	7	2.3
More than enough		
Possession of car		
No	103	34.3
Yes	197	65.7
Crowding index		
<1.5	72	24
1.6-2.5	159	53
	69	23
>2.5		
Years of formal education		
Illiterate		
Read and write	218	72.7
	49	16.3
Primary	15	5
	12	4
Secondary	6	2
Diploma, university and higher education		
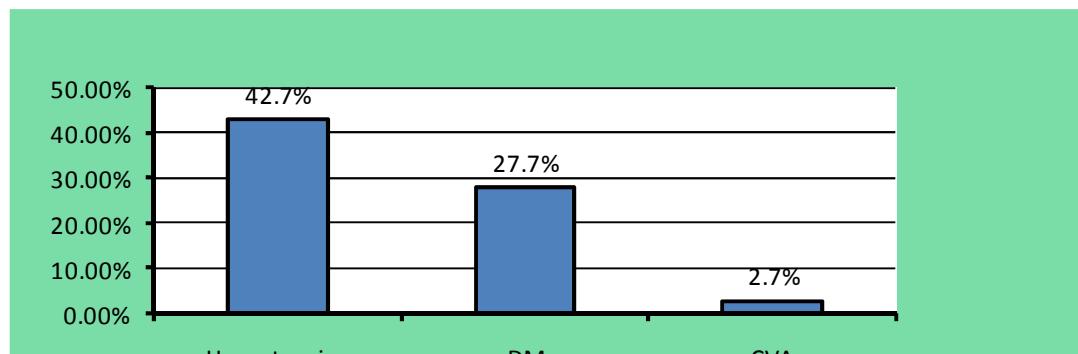
Fig.1.Past medical diseases of studied sample
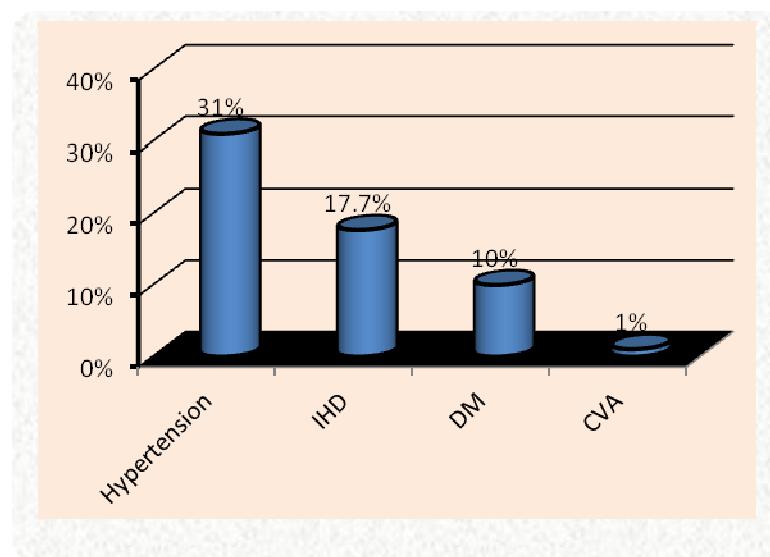
**Fig.2. Family history of disease**
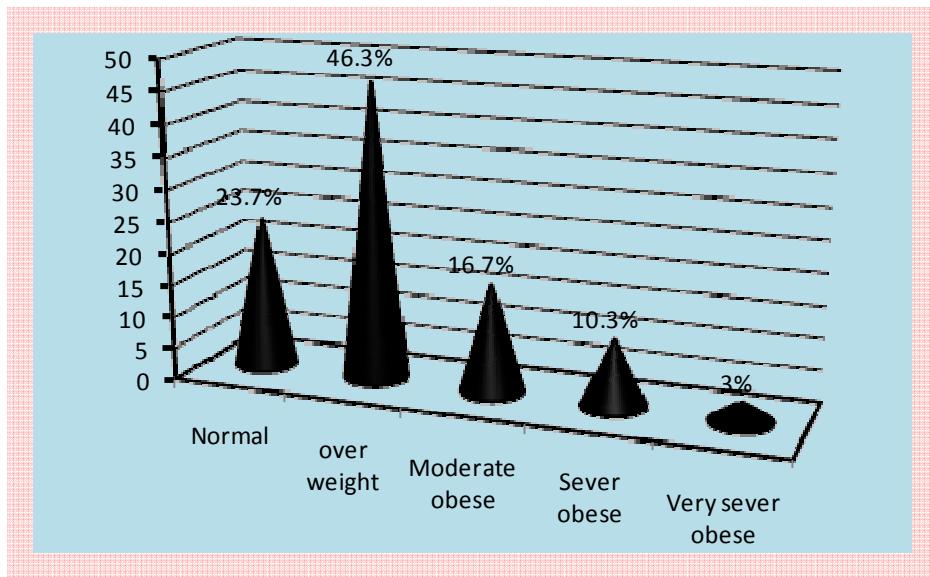
Fig.3. BMI of studied sample

Table 3.3 Smoking status before and after MI occurrence (No.= 300)

Smoking Status	No.	%
Before CHD Occurrence		
Nonsmokers	140	46.7
Former Smokers	77	25.6
Current Smokers	83	27.7
After CHD occurrence		
Quitter	51	62.7%
Relapsed	0	0%
Persistent	31	37.3%

Table3.4 Number of cigarettes smoked and period of smoking before and after MI occurrence.

Period of smoking and number of cigarettes	Minimum	Maximum	Mean
Before MI			
Period of smoking occurrence in years	4	70	
Number of cigarettes per day	3	120	35.45
After MI			
Period of smoking occurrence in years	1	12	
Number of cigarettes per day	5	70	25.94

Table 3.5 Alcohol intake behavior before and after MI events

Variable	No.	%
Alcohol intake before MI		
No	280	93.3
Yes	20	6.7
Frequency intake before MI		
Every day	1	0.3
2-3time/week	9	3
On occasion	10	3.3
Alcohol intake after MI		
No	284	94.7
Yes	16	5.3
Frequency intake after MI		
Every day	1	0.3
2-3time/week	2	0.7
On occasion	13	4.3

3.6 Exercise behavior before and after MI occurrence

Variable	No.(Total=300)	%
Exercise before MI		
No	278	92.7
Yes	22	7.3
Regular	7	2.3
Irregular	15	5
Exercise after MI		
No	273	91
Yes	27	9
Regular	12	4
Irregular	15	5

Table 3.7 Food control -behavior before and after MI occurrence

Variable	No.	%
Control of food before MI		
No	267	89
Yes	33	11
Occasionally	31	10.3
Always	2	0.7
Control of food after MI		
No	97	32.3
Yes	203	67.7
Occasionally	149	49.7
Always	54	18

Table 3.8 Assessment of Health behaviors before MI event in relation with gender of patients

Health behavior before MI event	Male(n=155)		Female(n=145)		Total(n=300)		x^2	P-value
	No.	%	No.	%	No.	%		
Smoking Status -Before MI								
No	87	40.1	130	59.9	217	72.3	42.078	<0.001
Yes	68	81.9	15	18.1	83	27.7		
Alcohol intake-Before MI								
No	137	48.9	143	51.1	280	93.3	12.609	<0.001
Yes	18	90	2	10	20	6.7		
Exercise-Before MI								
No	138	49.6	140	50.4	278	92.7	6.233	0.013
Yes	17	77.3	5	22.7	22	7.3		
Food control-Before MI								
No	142	53.2	125	46.8	267	89	2.236	0.135
Yes	13	39.4	20	60.6	33	11		

Table 3.9 Assessment of Health behaviors after MI event in relation with gender of patients

Health behavior after MI event	Male(n=155)		Female(n=145)		Total(n=300)		x^2	P-value
	No.	%	No.	%	No.	%		
Smoking Status -After MI								
No	128	47.58	141	52.42	269	89.7	17.37	0.001
Yes	27	87.1	4	12.9	31	10.3		
Alcohol intake-After MI								
No	141	49.65	143	50.35	284	94.7	8.69	0.003
Yes	14	87.5	2	12.5	16	5.3		
Exercise-After MI								
No	135	49.45	138	50.55	273	91	5.966	0.015
Yes	20	74.1	7	25.9	27	9		
Food control-After MI								
No	49	50.5	48	49.5	97	32.3	0.076	0.783
Yes	106	52.2	97	47.8	203	67.7		

Table 3.10 Distribution of patients according to association of health behavior (smoking, alcohol intake, exercise and food control) before and after MI events.

Variable	After				Total n	P
	No		Yes			
Before	No.	%	No.	%		
Smoking.						
No	217	100	0	0	217	0.001
Yes	52	62.7	31	37.3	83	
Alcohol intake						
No	280	100	0	0	280	0.125
Yes	4	20	16	80	20	
Exercise						
No	268	96.4	10	3.6	278	0.302
Yes	5	22.7	17	77.3	22	
Food control						
No	97	36.3	170	63.7	267	<0.001
Yes	0	0	33	100	33	

Note: Mc Nemar test are used.