NUTRITIONAL ASSESSMENT OF CARDIOVASCULAR DISEASED (CVDs) PATIENTS IN DISTRICT MARDAN

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ABSTRACT

Cardiovascular disease (CVD) is the major cause of morbidity and mortality in the developed areas and underdeveloped countries of the world, being two to five times more common in men as compared to women. Cardiovascular disease is linked with obesity, diabetes and hypertension. A cross- sectional study was conducted at Mardan Medical Complex, hospital located in the District Mardan. The aim of study was to assess nutritional status of cardiac patients (weight, age, BMI, MUAC, blood pressure, diet history, stress and smoking) in April to June 2022. Microsoft excel was used for plotting of graphs. In current study the results showed that males were more sensitive to CVD as compared to females because of their stressful life. Middle age adults were more sensitive to CVD, 64% respondents were overweight and obese and 41.5% MUAC were lie in 26 to 30cm. People who consumed saturated fats, red meat, fast and processed foods more, were overweight, consumed less fruits were more vulnerable to CVD. Cardiovascular disease was highly prevalent among people due to consumption of unhealthy and imbalanced diet and also due to lack of exercise and sedentary life style. The present study recommend that male should take preventive measures to reduce risk of cardiac disease for this they should overcome stress and avoid smoking, limit the consumption of saturated fats, beef, fast and processed foods. Fruits should be consumed on daily basis with regular physical activity.

Key words: Cardiovascular Disease, Nutritional assessment, Dietary Intake

INTRODUCTION

Cardiovascular disease involves narrowed or blocked blood vessels that lead to heart attack. The term heart disease is used interchangeably with the term cardiovascular disease. Cardiovascular disease affects heart muscles, valves or rhythm (Çakmak, 2020). According to the WHO heart disease remains the major cause of mortality and is responsible for the morbidity and mortality in both men and women. In Pakistan the prevalence of deaths resulting due to coronary heart disease is round about 29.6%. There are some kinds of symptoms associated with CVD such as chest pain, stroke, ischemic heart disease or myocardial infarction (Demir *et al.,* 2020). Chest pain or angina pectoris is a leading symptom of CVD which relates to pressure, fullness, burning or tightness in the chest. Angina pectoris is term in which artery wall becomes narrow which leads to reduction of blood supply to the heart muscles; it frequently shoots into the shoulder, arm, and hand (Kalvelage *et al.,* 2020). Ischemic stroke is one of the CVD symptom, also

known as cerebral infarction, which is defined as local blood supply obstruction which leads to cerebral anoxia, ischemic necrosis and coming apoptotic cell death accompanied by the loss of neurological functions. Ischemic stroke is triggered by atherosclerosis (Kukumberg *et al*., 2020). Ischemic Stroke has been shown to have a higher prevalence and mortality rate in Asian countries as compared to the rest of the world with unclear reasons (Wong *et al.,* 2020). It represents the leading cause of death in women (Aggarwal *et al*., 2018). Cardiac arrest or myocardial infarction is another symptom of cardiovascular disease in which there is an infarct that is necrosis (dead) local area as a result of inadequate vascular system, which cause cellular damage. The symptoms of stomach or abdominal discomfort, nausea or vomiting, headache, and feeling of anxiety are associated with this (Birnbach, *et al*., 2020).

Möller-Leimkühler (2022) reported that cardiovascular disease (CVD) being two to five times more common in men as compared to women. Cardiovascular disease (CVD) has also known as a male heart disease, due to men's higher absolute risk as compared to women. Yamada *et al.* (2021) performed a cohort study to know the linkage of systolic and diastolic blood pressure with the occurrence of CVD in accordance with blood sugar levels. The results indicated that irrespective of the presence or severity of a glucose imbalance, CVD occurrence risks increased gradually as systolic blood pressure and diastolic blood pressure increased. Bhatia *et al.* (2022) carried out an observational research in order to explore the interconnection of Body Mass Index (BMI) with the intensity of cardiovascular disease. The study concluded that BMI were not relating to the severity of coronary artery disease in Indian population.

Factors that have been suggested as the causes of Cardiovascular diseases, including behavioral risk factors that is related to unhealthy diet and obesity, lack of physical activity and smoking, among which inappropriate diet is the most important (Khoramdad *et al.,* 2017; Masana *et al*., 2017).

Han and Won (2022) concluded that physical activity plays an important role in CVD also it can be used as secondary prevention in CVD. Zakaria *et al.* (2020) reported that physical activity is the strongest factor associated with CVDs status. Physical activity provides a protective pathway to reduce the risk of cardiovascular disease. Physically active people can significantly reduce the risk of CVDs. Salehi *et al.* (2021) followed a systematic review and meta-analysis, reviewed 11 observational studies that includes smokers. The aim was to know that smoking is the risk factor of coronary artery disease or not. Out of 11 studies 6 studies showed no relation between smoking and the number of damaged arteries and 5 studies showed that smoking relates to CVD severity. study concluded stated that smoking is the risk factor of CVD.

Mark *et al*. (2020) reviewed different studies in which he examined that a significant risk factor for coronary heart disease is diabetes mellitus (CVD). Form of diabetes (T2D) is the most common type of diabetes mellitus and is largely linked to CVDs in general population. The overabundant use of saturated fatty acid can also give rise to coronary heart disease (Norman & J. Temple 2018) (Vasankari *et al.*, 2021). Saturated fatty acids are present in all types of foods but are mostly found in dairy products, red meat and the tropical oils. The study about saturated fatty acid causing cardiovascular diseases came to light in late 1950s, when scientists noticed that saturate fatty acid was responsible for the increased level of total serum cholesterol and as a result was the risk factor for cardiac disease (Astrup *et al.*, 2021). Sekhar *et al.* (2021) conducted a prospective cohort research to identify the link between dietary saturated fat and the onset of coronary heart disease. The study concluded that the increased intake of dietary saturated fats is directly proportional to the development or severity of coronary artery disease.

Du *et al.* (2021) followed a prospective study to assess the linkage between higher ultra- processed food and risk of CVD. The study proved the hypothesis true that higher ultra-processed food intake can increase the risk of coronary artery disease. Hae-Young Lee (2022) studied that ultra-processed food (UPF) is salty and sweet, industrially produced, and primarily consists of compounds derived from whole food. Ultra-processed foods do not only include so-called junk foods but also many foods that are marketed and perceived as healthy, such as flavored yogurts, reduced-calorie or low-fat products, breakfast cereals, and products enriched with beneficial nutrients.

Noor *et al.* (2021) performed a cross-sectional study aimed to know the effect of fast foods consumption on the incidence of CVD. The study concluded that the intake of fast foods increases the risk of coronary artery disease and vice versa, but fresh fruits and fresh vegetables consumption reduces the risk of cardiovascular disease.

Moller *et al.* (2020) reported that numerous studies have examined the relationship between eating meat and developing heart disease, however it has been hypothesized that other dietary components may affect this relationship. The goal of the current investigation was to determine whether eating meat is linked to ischemic heart disease (IHD) and whether dietary quality affects this association. Elsheikh *et al*. (2021) conducted an observational cross-sectional study. The goal of this study was to determine the prevalence of cardiovascular disease (CVD) among meat consumers, whether they ate red or white meat. The study conclusion showed that increased consumption of red meat and processed meat is link to a higher risk of coronary artery disease. Chartier *et al.* (2020) conducted the study that although eggs are an extremely cheap source of high-quality protein, iron, unsaturated fatty acids, phospholipids, and carotene, they are also a significant source of dietary cholesterol. The relationship between egg consumption and the risk of

cardiovascular disease has been a highly debated subject over the past ten years because of the cholesterol concentration in eggs. High salt intake is important risk factor of cardiovascular disease. Whereas, food processing can also influence diet quality which might be related with cardiovascular disease (Lee, 2022). Patel and joseph (2020) presented a study that consuming too much sodium has been linked to the development of numerous illnesses, such as hypertensive, renal disease, brain, and heart disease. Osadnik *et al*. (2018) carried out a case-control study in order to find the relationship with dietary practices and CVD family medical history. The findings suggested that young, healthy persons with bad eating habits and a family history of CVD may be a target population for the disease. Clinical and epidemiological observations shows that vegetable and fruit fiber, nuts and seeds, sea foods, coffee, tea, and dark chocolate have cardio protective potential in humans, as well whole-grain products containing intact grain kernels which are rich in fiber and trace nutrients. They are nutritionally more important because they contain phytoprotective substances that might work to reduce cardiovascular risk (Asgary *et al*., 2018). Okekunle *et al.* (2022) goes through a meta-analysis to evaluate whether there is actually a connection between the higher consumption of green leafy vegetables and the prevalence of CVD. Increased diet of leafy green vegetables could largely aid in CVD prevention. In conclusion nutritional status and Dietary habits affect CVD. This study evaluated the social demographic, physiological traits and nutritional assessment of cardiac patients in District Mardan.

METHODS AND MATERIALS

This study was conducted in Mardan Medical Complex (MMC) located in District Mardan. The hospital is well established and provided huge health services to various diseases. An approval for data collection was taken from the medical superintendent of respective hospital. A cross sectional study design was used to conduct the current research. A sample of 200 patients was randomly assessed from coronary heart disease patients. Before the enrollment the purpose of the questionnaire was explained to the patient, care taker or guardians and a consent letter was signed from them. This study was conducted over a period of 3 months from February to April 2022. This study included cardiovascular disease patients of both genders. Demographic, socioeconomic, nutritional and Dietary information was accessed by a pre-defined questionnaire including data about patient gender, age, weight, height, MUAC, Blood pressure and BMI and nutritional status, was assessed.

Results and Discussion

Majority of the respondents (66.5%) were male while (33.5%) respondents were females. Qurat ul Ain *et al.*, (2019) conducted a study in which their result showed that (76.6%) were women and (23.4%) were

men. Moshki et al., (2015) conducted a study on gender differences in CVD, their results showed 76% males and 33% females, approximately the same as in the present study. Same findings were also observed by another researcher that men's coping with stressful events may be less adaptive physiologically, emotionally and behaviorally, and bestow the increased risk for cardiac diseases (Weidner. 2000). Whereas age distribution among 200 respondents was analyzed as, 37% respondents were belonged to age group of 40-55 years, 54% respondents lied in 56-75 years group while 9% patients belongs to 76-90 years. Result showed that majority of the respondents in age group 56-75 years were at high risk of CVD as shown in table 1.

Forty three respondents had weight in range of 40 to 55kg, 86 respondents had weight in 56 to 75 kg, and 71 respondents had weight in range of 76 to 110kg. Thirty two percent respondents had normal MUAC ranges 41.5% were overweight whereas 26% belonged to obese range. Hou *et al.,* (2019) performed a study in Shinghai, China and found that MUAC was in linked with central obesity. For BMI ranges 36% patients had normal BMI, 31% were overweight where as 33% respondents were obese. Results showed that majority of CVD patients were overweight and obese and few had normal body mass index. Riaz *et al.,* (2018) reviewed 7 studies and performed meta- analysis and found that obesity was significantly associated with increased risk of coronary heart disease, and same was observed in the present study as shown in table 2.

Blood pressure of cardiac patients, 13.5% (n=27) respondents had normal blood pressure, 45% (n=92) were Pre-hypertensive and 40.5% (n=81) respondents were hypertensive as shown in figure 1. Fuchs *et al.,* (2020) conducted a study that hypertension is a major and prominent risk factor in cardiac patients. In the current study, the high Blood pressure observed in 40.5% of individuals which pose a great risk for involvement in the cardiac diseases. Mirzaeipour *et al.,* (2019) described the risk factors of coronary heart disease in their case-control study that hypertension were developed in 64.1% respondents,

Different diseases are linked with cardiovascular disease, in present study 48% were diabetic, 30.5% respondents had renal disease, whereas 21.5% had high cholesterol as shown in figure 2. Arif *et al.,* (2013) reported that 37.6% respondents were diabetic in his study. This study shows similarities with Leon and Maddon, (2015) who reported that diabetes is second most common risk factor of CVDs. Mirzaeipour *et al.,* (2019) performed case-control study high cholesterol was developed in 77.3% in CVD patients. For physical activity of CVDs patients n=84 (42%) were having sedentary lifestyle, n=74 (37%) were having moderate life style while n= 42 (21%) were having extraneous lifestyle. Results showed that majoriy of the subjects lied moderate and sedentary lifestyle while extraneous lifestyle was observed by few patients. Rattan *et al.,* (2013) evaluated a study of men and women physical activity level in cardiovascular disease patients their results showed 86.1% sedentary physical activity. As shown in figure

1. Another study also supporting our study that people who engage in <550 kcal/wk in leisure-time physical activity have significantly reduced risk of cardiac diseases Winzer *et al.,* (2018). CVD respondents which had family history of cardiovascular were 45.5% whereas, 54.5% had no family history of CVD. Mirzaeipour *et al.,* (2019) conducted a study that 56.6% respondents had positive family history of CVD. Sajid *et al.,* (2020) conducted a study that showed family history of CVDs was more than double in cases 35.6% as compared to those who had no positive family history.

As food consumption reported by respondents 61(30.5%) consumed oil,, 85 (42.5%) had low fat milk, and 25 (12.5%) has whole milk while 139 (69.5%) were consuming ghee and n=90 (45%) respondents were not consuming any type of milk. Fast food and Fried foods are very common that is consumed by people, cardiac patients also had consumed fast foods 21(10.5%) patients once a week, 27(13.5%) subjects take twice a week and 152(76%) had not consumed fast foods while 103(51.5%) respondents took fried foods in their diet, 97(48.5%) respondents had not eaten fried foods in their diet. Also the patients with cardiac disease consume different type of meat 90(45%) consumed beef, 25(12.5%) consumed mutton, 40(20%) consumed chicken and 45(22.5%) consumed fish. CVD 27(13.5%) patients had consumed one egg per day in their diet, 23(11.5%) subjects had two eggs per day in diet and 150(75%) subjects had never consumed eggs in their diet as shown in Table 3. A recent review from Italy in 2021 reported the association of milk and other dairy products with the cardiac diseases, and showed that there is a strong link between the dairy products and the cardiac diseases, in the current investigation same findings was observed, the positive association between milk and fat with the cardiac diseases (Giosuè *et al.,* 2021). Nazeminezhad *et al.,* (2014) conducted a case-control study and assessed that the intake of saturated fatty acids was ingreater amount in the diseased group than the other, the same findings were also shown in current study with (69.5%) consumption. Another report from reported that it is widely known that the saturated fats present in our diet elevated the serum cholesterol, which in turn become a major risk of cardiac diseases (Gholam *et al.,* 2017). Results showed that majority of the participants consuming ghee, beef, fast and fried foods. Sekhar et al., (2021) reported that consumption of meat is associated with the development of cardiovascular disease but fish consumption was found to lower the incident of CVD, the same findings were also shown in current study.

Out of n=200 respondents, which showed that patients who smoked were 19% and nonsmokers were 81%. Chawla *et al.,* (2013) were studied nutritional assessment of cardiac patients in men and women which showed that patients who smokes were 10.9% while nonsmokers were 89.1% smoking is interlinked with the cause of heart attacks because smoking leading to atherosclerosis which cause headache Whereas 66% respondents were taking stress and 34% were not taking stress as shown in figure

2. Stress leads to higher BP which can cause a risk of heart attack and releasing negative hormone in body which directly cause vasospasm. The results showed that majority of participants were stressed. Vancheri *et al.,* (2022) conducted a study that mental stress is associated with the development of cardiovascular diseases.

Out of n=200 respondents, consume different type of fruits as shown in figure 4.8 that 13.5% respondents had (watermelon), 29% had (apple), 14% subjects had banana and 43.4% subjects ate other fruits in their diet on daily basis. As shown in the current study, the effect of fruits such as apple, peach, water melon and other fruits, as we already know with the previous literature that Fruits usage can prevent the cardiac diseases or facilitate the restoration of morphology and functions of heart and vessels after injury (Zhao *et al.,* 2017). These findings are in agreement with the current study. Both type of vegetables is mostly consumed by cardiac patients that showed 91.5% and non- starchy vegetables that is 8.5% while quantity of eating vegetables shows that 65% patients ate 1 plate and 1/2 plate were ate by 35%. Aune *et al.,* (2017) performed a meta-analysis and found that adequate consumption of fruits and vegetables is inversely related to the occurrence of coronary heart disease, that 88.5% were consuming vegetables whereas in current study 91.5% patients consume vegetables. In the current study, it has been noticed that water intake by cardiac patients, 47% respondents drink 1 to 5 glasses of water daily and 53% respondents drink 5 and so on glasses of water daily. Another survey from Korea investigated the relationship between drinking water and developing heart problems, and showed that water intake has positive impact on cardiac diseases (Jang *et al.,* 2016). As according to World health organization (WHO) water is essential to control heart diseases, as per WHO guideline the recommended daily requirement is 2.9 L for men, 1.0 L for children, and 2.2 L for women, respectively. Due to the ethanol's breakdown, consuming alcohol has an osmotic impact and dehydration, which eventually increases water consumption (Azarov, A.V. and Woodward, D.J., 2014).

CONCLUSIONs AND RECOMMENDATIONS

The present study aimed to find out the Nutritional Assessment so the present study concluded that the prevalence based on gender is high in males as compared to females. Stress and smoking are the leading causes of CVD. People who consumed saturated fats, red meat, fast and processed foods more, were overweight, consumed less fruits were more vulnerable to CVD. Cardiovascular disease was highly prevelent among people due to consumption of unhealthy and imbalanced diet and also due to lack of exercise and sedentary life style. The present study recommend that male should take preventive measures to reduce risk of cardiac disease for this

they should overcome stress and avoid smoking, limit the consumption of saturated fats, beef, fast and processed foods. Fruits should be consumed on daily basis with regular physical activity.

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Table .1 Gender and Age wise distribution of CVD patients

Variables	Categories	Percentage
Gender	Male	66.5
	Female	33.5
Age	40-55	37
	56-75	54
	76-90	9

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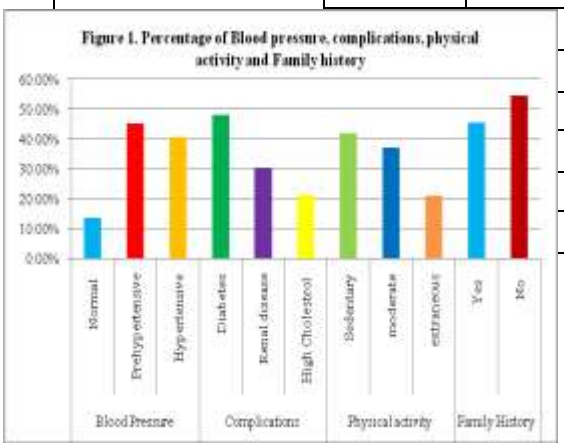
Table 2 Weight, MUAC and BMI of CVD patients

Variables	Categories	Frequency	Percentage
Weight	40-55kg	43	21.5%
	56-75kg	86	43%
	76-110kg	71	35.5%
MUAC	20-25cm	65	32.5%
	26-30cm	83	41.5%
	31-35cm	52	26%
BMI	18.5-24.9 (normal)	72	36%
	25.0-29.9 (overweight)	62	31%
	>30 (obese)	66	33%

Table: 3: Dietary history of cardiac patient

Variables	Categories	Frequency	Percentage
Type of fat	Oil	61	30.5
	Ghee	139	69.5
Type of Milk	Low fats	85	42.5

	Whole Milk	25	12.5
	None	90	45
Fast Food /week	1 time	21	10.5
	2 times	27	13.5
	Never	152	76
Fried Foods	Yes	103	51.5
	No	97	48.5
Types of Meat	Beef	90	45
	Mutton	25	12.5
	Chicken	40	20
	Fish	45	22.5
Eggs/day	1/day	27	13.5
			11.5
			75
			19
			81
			66
			34



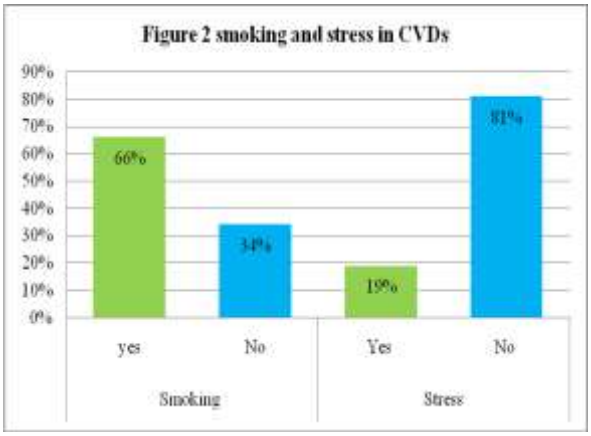


Table: 4. Intake of fruits, vegetables and water by cardiac patients

Variables	Categories	Frequency	Percentage
Type of Fruits	Water melon	27	13.5
	Apple	58	29
	Banana	28	14
	Other fruits	87	43.5
Vegetables	Non-Starchy	17	8.5
	Both	183	91.5
Quantity	1 Plate	130	65
	½ Plate	70	35
Water intake	1to5 glass	94	47%
	5to so on	106	53%