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Consumed Nutrients by Cardiovascular Inpatient and Outpatient in Some Hospitals of Cairo Governorate

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ABSTRACT:

Cardiovascular diseases (CVDs) are the leading cause of death globally, representing approximately 30% of all fatalities. Evaluating nutritional status is essential to determine if an individual has a nutritional imbalance due to an underlying condition. The purpose of nutrition counseling is to assist clients in gaining a better understanding of vital health-related information. This work aimed to study the possible relationship between cardiovascular disease and nutrition in some inpatients and outpatients in hospitals of Cairo Governorate. A study was conducted on a sample of one hundred heart patients from a hospital in Cairo. The patients were divided into two equal groups, with 50 patients in each group - 25 inpatients and 25 outpatients. This distribution was designed to have 25 males and 25 females in each group. Outpatients' CVD percentage showed more for Body Mass Index, Total cholesterol, Alanine Transaminase, uric acid, Hemoglobin, and Sodium blood test. The percentage of females was higher than for Body Mass Index, Lactate dehydrogenase, and Hemoglobin. Male percentage was more than females for White blood cells, WH, Lactate dehydrogenase, Creatine Kinase, Triglycerides, Alanine Transaminase, Aspartate Transaminase, creatinine, and uric acid.

Keywords: Heart diseases, (inpatients-outpatients), Smoking, Nutritional status

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1. INTRODUCTION

The nutritional status of patients is assessed based on a diagnosis of malnutrition, which helps identify underlying medical issues and typically informs the planning of interventions following a nutritional assessment [1]. The prevalence of heart failure has risen in recent years, even with advancements in treatment options. Additionally, the widespread presence of cardiovascular risk factors globally is strongly linked to lifestyle choices and emerging nutritional and dietary trends, which contribute to the growing incidence of cardiovascular disease. Research indicates that heart failure affects 18 million people who die from cardiovascular disease each year [2]. Cardiovascular disease (CVD) develops gradually over the years. During this period, the blood supply to the heart is compromised

by a buildup of fatty substances, such as atheroma, in the coronary arteries and many other arteries throughout the body. This process is more commonly referred to as the hardening of the arteries [4] and [5]. Cardiovascular diseases encompass a variety of conditions that impact the structure and function of the heart, including coronary artery disease, congenital heart defects, heart failure, and vascular diseases. Besides hypertension, other risk factors for cardiovascular disease, such as hypercholesterolemia and obesity, have consistently been linked to a higher risk of morbidity and mortality related to cardiovascular diseases [6]. Cardiovascular disease is the top cause of death in the U.S. and globally. It includes various conditions, among which six are examined in this scientific declaration: heart attack, heart failure, valve disease, stroke, heart rhythm disorders, and peripheral artery and vein disease [7]. Moderate fish and shellfish consumption, which varied based on proximity to the ocean, was a major source of protein. Extra-virgin olive oil (EVOO) and red wine are the main sources of fat and alcohol for anyone following the traditional Mediterranean diet; nonetheless, these foods are still off-limits to Muslims [2]. This diet is generally nutrient-dense and appealing due to the liberal use of olive oil painting in salads, traditionally cooked vegetables, and lentils, as well as the moderation of red wine drinking during reflections [3]. Many bioactive polyphenols with purported anti-inflammatory properties, such as hydroxytyrosol and tyrosol, oleocanthal, and resveratrol, are found in red wine and extra virgin olive oil. Olive oil painting's purported antiatherogenic properties were reportedly linked to its high monounsaturated fat (MUFA; oleic acid) concentration and a few more recent studies [8]. Flavonoids are metabolites of plants and fungus. Flavonoid research has been paid special attention to in recent times after the observation of their beneficial effects on the cardiovascular system. These favorable effects are exerted by flavonoids mainly due to their antioxidant properties, which result from the ability to decrease the oxidation of low-density lipoproteins, thus improving the lipid profiles[10]. Thus, in order to reduce the socioeconomic impact of cardiovascular disease on these nations' healthcare systems, comprehensive strategies are required. Programs for secondary prevention and cardiac rehabilitation (CR) are acknowledged as an all-inclusive continuum of care for people with cardiovascular disease. It is a multidisciplinary strategy that lowers the risk of cardiovascular disease [3]. Anyhow cardiovascular disease could be prevented by applying possible means. Due to rapid and ceaseless increase of food prices, evaluation of the consumed nutrients by patients, especially with CVD should be repeated every year. This helps to nation the good health to CVD patients, and also helps the government plan to provide markets with foods needed to the public [18].

This study aimed to discover the possible relation between cardiovascular disease and nutrition on some inpatients and outpatients in hospitals of Cairo Governorate.

2-Subject and Methods:

2.1. Subject:

2.1.1. Sample size:

A sample of one hundred heart patients from inpatient and outpatient services at some hospitals in Cairo participated in a research study. The patients were divided into two groups, each consisting of 50 patients - 25 inpatients and 25 outpatients. The groups were structured to have an identical composition of 25 males and 25 females in each group.

2.2. Methods:

2.2.1. Daily Dietary Data:

Information on the participants' daily dietary intake was collected through interviews. A 24-

hour recall method was used to record their food consumption for three days, including one weekend day. The nutrient content of the consumed foods was calculated using computer analysis based on data for ready-to-eat Egyptian food items from the Faculty of Home Economics, Menoufia University (Special Nature Unit).

The adequacy of the participants' diets was assessed in terms of the recommended intakes of macro nutrients (calories, protein, fat, carbohydrates, and fiber), minerals, and vitamins. The nutritive value of the consumed diet was compared against the Dietary Reference Intakes (DRI) appropriate for the study participants.

2.2.2. Anthropometric measurements:

In addition to the dietary data, anthropometric measurements were also collected. These included the participants' weight (in kilograms), height (in centimeters), and body mass index (BMI) calculated as weight in kilograms divided by height in meters squared (kg/m²). Standards published by [29] were used.

The obtained results were estimated for the following parameters:

2.2.2.1Body weight

Classification (Weight status)	BMI (Body Mass Index)
Under Weight	<18,5 kg \m^2
Normal (Healthy) Weight	18,5-24,9kg \m^2
Over Weight (not obese)	25-29,9 kg \m^2
Obese	≥30 kg \m^2
Grade 1 Obesity	30-34,9 kg \m^2
Grade 2 Obesity	35-39,9 kg \m^2
Grade 3 Obesity	≥40 kg \m^2

weight was assessed using a beam-type balance. The participants were weighed while wearing light clothing and standing barefoot [24].

2.2.2.2 Body height:

Body height was measured using a flexible, non-stretch tape measure. The participants stood on a flat surface with their feet parallel, and their heels, buttocks, shoulders, and back of the head touching an upright board. Their head was in a comfortable, erect position with the lower border of the eye orbit aligned in the same horizontal plane

2.2.2.3 Body mass index (BMI)

BMI was calculated using the formula:

BMI = Weight (in kilograms) ÷ (Height in meters)²[24]

This formula was used to determine the BMI for each participant based on their measured weight and height values[23].

2.2.3 Laboratory analysis:

Laboratory analysis refers to the systematic process of examining and evaluating samples through various scientific methods and techniques. The findings from laboratory analyses are essential for diagnosing diseases Hemoglobin and hematocrit to assess anemia [20].

Lipid profile includes total cholesterol, triglycerides, HDL High-density lipoprotein, and low-density lipoprotein according to [18].

Cardiac enzymes CK, CKMB Creatine kinase-MB, and LDH Lactate dehydrogenase [13].

Kidney function tests (urea according to [25], creatinine according to [15], and uric acid according to [16].

Electrolytes (sodium, potassium ….)[21].

Liver enzymes (ALT, AST) according to [22].

Direct interviews with patients obtained other information.

2.2.4. Statistics:

The data was analyzed using computer software [26]

3. Results and Discussion:

The study revealed that both gender and residence had a relationship between consumed nutrients and the percentage of males and females inflicted with the disease. This was evident for BMI Body mass index, WC Waist Circumference, Waist Hip (WH), LDH Lactate dehydrogenase, TG triglycerides, LDL

Low-density lipoprotein, ALT, AST, uric acid, HGB (hemoglobin), WBC (white blood cells), Na sodium, carbohydrates, Fe (Iron), Zn(zinc) and Vitamin. A.

Table (1): Comparison between males and females for anthropometric measurement regarding group study

	Outpatient				Inpatient			
	Male		Female		Male		Female	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Age (Year)	56.0	6.7	59.6	8.9	57.9	7.2	54.5	5.3
Weight (kg)	98.2	9.1	95.0	6.9	96.1	7.6	91.6	7.1*
Height (cm)	175.7	3.9	160.0	4.5*	175.8	5.1	161.7	7.1*
BMI (Body mass index.) (Kg/m^2)	31.8	3.7	37.1	4.3*	31.1	3.5	35.0	3.1*
Waist Circumference (WC) (cm)	98.6	3.9	93.2	6.3*	96.4	2.7	93.0	3.7*
Waist Hip ratio (W/H)	1.4	0.2	0.9	0.1*	1.6	0.3	0.9	0.1*

** There is a significant difference σ≤0,05*

All in- and outpatients are shown in Table (1): BMI value of more than 30 kg/m2 being obese Grade 1 or Grade 2 obesity. In this concern, BMI of outpatients was higher than inpatients, and BMI of females more than males provided that outpatients female revealed a higher BMI (37.1 kg/m2) than the inpatients (35.0 kg/m2). Anyhow BMI of females was more (35-37.1 kg/m2) than the males (31.0- 31.8 kg/m2).[24]. WC was mostly more for outpatients than inpatients, and more for males than females, For females WC should be less than 88.9 cm. It is evident that for males (96.4-98.6 cm) WC was more than 94 cm being less than 101 cm still you away from allowed. However, 102 female WC outpatients were less than 94 cm (93.2 cm for outpatients &93.0 cm for inpatients) and did not follow the BMI values. Similarly, WH was less for females than the males ratio should be less than 0.9 for males, and should be less than 0.85 for females. Results of Table (1) revealed that W/H ratio for males was 1.4- 1.6 (more than 1) and for females (0.9- 0.9) was more than 0.85. This clearly indicates that both groups are subjected to health problems[18]. Such disagreement may be because the fat in the body is not the only fat measured; there is also the visceral fat for example.

Table (2): Comparison between males and females for smoking regarding group study

		Outpatient				Inpatient			
		Male		Female		Male		Female	
		No	%	No	%	No	%	No	%
Smoker	Yes	17	68.0	3	12.0	12	48.0	6	24.0
	No	8	32.0	22	88.0	13	52.0	19	76.0
Smoke type	Cigarettes	17	100.0	1	12.5	7	58.3	0	0.0
	Shisha	0	0.0	7	87.5	5	41.7	7	100.0

Data presented in Table (2) show the percent distribution of CVD patients according to smoking with reference to residence and gender.

For entrance, it was observed that even for inpatients males that were smokers were more regardless of residence. For inpatients female who smokes were 24% and 48% for males. Actually, it is astonishing that those CVD patients especially those who are inpatients didn't stop smoking. Male smokers' outpatients reached more than half the CVD, 68%. Actually, smokers males either resident outside or inside the hospital were more than female smokers [2]. It may be suggested that hospitals and administration should threaten

patients of not giving treatment for CVD who smoke. The high percentage of smokers males with CVD was 68% and 12% for females. This is actually annoying, particularly for females[3]. As for the type of smoking, it was found that 100% of male outpatients like cigarettes and also 58.3% of females, this is because cigarettes are easily used compared to shisha. Moreover 100% of female inpatients, like to smoke shisha which raises the question, of how hospital administration allows patients to smoke shisha inside the hospital [3]. Undoubtedly smoking aggravates CVD, and so control should be more to stop smoking by patients.

Table (3): Comparison between males and females for total lipids results regarding group study

	Outpatient				Inpatient			
	Male		Female		Male		Female	
	Mean	S D	Mean	SD	Mean	SD	Mean	SD
Cholesterol	200.5	17.7	193.4	15.7	189.0	39.3	192.6	15.6
Triglycerides	135.5	44.2	114.0	26.7*	139.6	28.9	121.2	34.3*
HDL	43.1	7.1	44.0	1.7	46.5	4.8	45.5	2.4
LDL	130.3	12.4	126.6	17.9	114.6	33.5	122.86	29.5
VLDL	27.1	6.6	22.8	5.6	27.92	7.1	24.24	6.1

*HDL: High-density lipoprotein, LDL: Low-density lipoprotein, and VLDL very Low-density lipoprotein * There is a significant difference σ≤0,05*

Abnormalities of various cholesterol lipoprotein lipids such as high total cholesterol, low-density lipoprotein (LDL) cholesterol, very low-density lipoprotein (VLDL) cholesterol and triglycerides, and low high-density lipoprotein (HDL) cholesterol are important coronary heart disease (CHD) risk factors. There is a strong pathophysiological association of raised LDL cholesterol with the initiation and progression of coronary atherosclerosis [18].

The results of table (3) show the lipids profile of sample members as regards residence and gender.

It could be observed that the cholesterol of CVD patients was 189.0- 200.5 mg/dl which (200mg/dl) is the threshold given by DRI for healthy people. Male outpatients only exceeded very slightly the DRI threshold (200 mg/dl). Cholesterol of outpatients male 200.5 mg/dl and females 193.4 mg/dl was higher than inpatients (189.0, and 192.6 mg/dl) respectively. This may indicate that the control of inpatients was more than inpatients. This may be also the case of HDL&LDL since HDL was more and LDL was less for inpatients compared to the outpatients. HDL for inpatients was higher (45.5- 46.5 mg/dl) than that of outpatients (43.1- 44 mg/dl). LDL of inpatients was lower (114.6- 127.9 mg/dl) than that of outpatients (126.6- 130.3 mg/dl). Nevertheless, TG and also VLDL showed the reverse TG was less (114.0- 135.5 mg/dl) for outpatients than inpatients (121.2- 139.6 mg/dl) and VLDL lower for outpatients (22.8- 27.1 mg/dl) than the inpatients (24.24- 27.92 mg/dl). TG was also away (114.0- 139.6 mg/dl) for the threshold given by DRI (150 mg/dl), and so was the threshold for VLDL (24 mg/dl).

Table (4): Comparison between male and female for liver enzymes results regarding group study

	Outpatient				Inpatient			
	Male		Female		Male		Female	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
ALT	37.0	5.8	33.3	5.2*	35.0	4.6	30.2	5.4*
AST	32.0	4.8	29.2	3.3*	29.9	3.0	27.5	3.4*

*AST: Aspartate transaminase and ALT: Alanine transaminase. * There is a significant difference P<0,05*

It should be noted that both out and inpatients who were actually CVD are at risk of severe suffering since they were near the threshold for lipids given by DRI [18]. This is easily concluded when reviewing the results of table (3) with DRI values. Reviewing the results of table (3), it could be observed that control of lipids fractions of all patients should be practiced to have the patients away from threshold DRI values [23].

Data from Table (4) show the liver enzymes of CVD out- and inpatients as influenced by gender. Recent research has highlighted a complex interplay between heart health and liver function, suggesting that conditions such as heart failure can lead to hepatic dysfunction, while liver diseases can exacerbate cardiovascular issues. This bidirectional relationship prompts a deeper examination of how impaired cardiac function influences liver metabolism and vice versa. Understanding these interactions is crucial for developing integrated treatment approaches that address both cardiovascular and liver health, ultimately improving patient outcomes [30].

ALT levels (30.2- 37 U/L) were near the threshold given by the DRI (7- 40 U/L). For outpatients males ALT activity was been the maximum allowed limit (40 U/L) for ALT.AST activity was also undesirable as it was also near maximum allowed limit (34 U/L) of DRI. In general [28], inpatients revealed better ALT and AST compared to of outpatients, possibly because of control given to the resident patients, but both out-and inpatients need to take control of liver functions [22]

Table (5): Comparison between male and female for kidney function results regarding group study

	Outpatient				Inpatient			
	Male		Female		Male		Female	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Urea	39.5	16.2	33.4	3.1	34.1	3.3	35.0	3.5*
Creatinine	0.9	0.2	0.8	0.1	0.9	0.1	0.8	0.1*
Uric Acid	4.4	1.0	4.3	0.9	4.2	0.6	3.9	1.1*

** There is a significant difference σ≤0,05 .*

Results of table (5) show the functions of kidneys based on serum analysis

Cardiovascular diseases (CVDs) and chronic kidney disease (CKD) are closely interconnected, forming a significant health challenge globally. The presence of CVD can adversely affect kidney function, leading to a condition known as cardiorenal syndrome, where the dysfunction of one organ induces the failure of the other. This reciprocal relationship highlights the importance of understanding how compromised cardiac health influences renal physiology, including alterations in blood flow, filtration rates, and fluid balance. Furthermore, the presence of kidney disease can exacerbate cardiovascular conditions by increasing the risk of hypertension and fluid overload. Exploring these interactions is essential for developing effective management strategies that address both cardiac and renal health, ultimately improving patient outcomes [30].

It could be observed that all of the three determined parameters fell in the range given by DRI. Meanwhile, values were evidently higher than the low limit of DRI. Outpatients had higher urea values than that of the inpatients except for one case (urea of female inpatients) [27]. Creatinine was the same for out- and inpatients, but uric acid was more for males than females except in the mentioned case. Finally with few exceptions, urea and uric acid were more for outpatients than the inpatients, and females than males. Since all values fell in the range given for biologically healthy members, the recommendation

advised by doctors may be said to them, e.g. "drink more water"[25].

Both liver functions and renal functions were mostly better for inpatients than outpatients and for females than males [31].

Table (6): Comparison between male and female for lab results regarding group study

	Outpatient				Inpatient			
	Male		Female		Male		Female	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
RBC	4.9	0.4	5.0	0.5	4.6	0.4	5.3	0.7*
HGB	12.7	1.6	13.1	0.7	12.3	0.8	12.9	0.6**
WBC	7.1	2.0	5.8	0.7*	5.8	0.6	6.1	0.6
HCT	38.9	5.6	41.3	1.4	41.2	3.0	41.4	1.7
MCV	82.2	5.6	80.6	7.4	84.7	2.8	75.9	10.4*
MCH	29.8	3.6	31.2	5.0	32.8	3.4	28.4	7.1*
MCHC	36.4	5.3	39.6	5.5*	41.2	5.9	37.1	5.1*
PLT	258.7	63.0	267.0	28.8	270.2	19.3	231.6	46.7*
Sodium	141.1	3.9	141.1	2.9	140.7	3.1	139.6	2.7
Potassium	4.2	0.4	3.9	0.6	4.1	0.4	4.4	0.7

RBC: Red blood cells, HGB: Hemoglobin, WBC: White blood cells, HCT: Hematocrit test, MCV: Mean corpuscular volume, MCH: Mean corpuscular hemoglobin, MCHC: Mean corpuscular hemoglobin concentration and PLT: Platelet count.
** There is a significant difference σ≤0,05*

Data in Table (6) show the CBC of CVD patients.

For all patients (Table 6) RBC was low (DRI values in 9.6- 14.9 × 106). This indicates anemia (iron deficiency), renal diseases, malnutrition, internal hemorrhaging, low levels of B6 (pyroxidine), and low levels of B12 (cobalamin). In this connection [13], females were higher in RBC than males, and inpatients higher than outpatients. Vit. B6 and Vit. B12 are found in many foods. HGB values for all patients fell in the range given by DRI for healthy persons (9.6- 14.9 g/dl). The female group had more hemoglobin regardless of residence, and inpatients showed slightly more than outpatients. HCT levels fell also in the DRI range. Females had more HCT than the outpatient males, regardless of residence, and inpatients had more HCT than the males. WBC of all patients was (5.8- 7.1 ×103) less than the range given by the DRI (9.2- 11.0 ×103). This means that patients were more valuable to developing infections and diseases. In its turn this is not relevant to CVD patients due to possible less immunity[12]. MCV values (75.9-84.7) were not in the range given by the DRI (34.7- 47.07 FL) it was higher. A high range of MCV may be ascribed to a deficiency of B12 and folic acid, and enlargement of RBC due to low intake of B12 and folic acid [12]. MCH values were also higher (28.4- 32.8 pg) than the DRI range (10.8- 14.6 pg). Such an increase may indicate an increase in the count of WBC. MCHC values were higher (37.1- 41.2 g/dl) than the DRI range (30- 34.9 g/dl). The higher MCHC values may indicate problems in liver and thyroid gland activity. This may be caused by feeding patients on apples, pomegranates, and some vegetables such as cucumbers [11]. PLT values (231.6- 270.2 ×103) fell in the range suggested by the DRI (150000- 450000 ×103). So no problems were presented with this function. Na in blood (139.6- 141.1 mg/liter) fell in the range suggested by DRI for the healthy subset (150000- 450000 mg/Liter). K in blood (3.9- 4.4 mm/L) was also in the range suggested by DRI for healthy human [20].

Males are usually more responsible for family support in Egypt, although nowadays both male and females do this job. CKMB test measure the amount of creatine enzyme in heart muscle, which is one of heart muscle tests. The increase of CKMB indicates damage in heart muscle and infection[15]. CKMB

values were higher than DRI (8.8- 27.0 IU/L) vs (5- 25 IU/L), indicating changes in the inequity of heart muscle. In this connection it should be noted that all study members are CVD [13].

Table (7): Comparison between males and females for inflammation markers regarding group study

	Outpatient				Inpatient			
	Male		Female		Male		Female	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
LDH	383.3	55.2	373.0	36.0	382.4	50.5	331.8	85.3*
CK	40.4	15.1	33.2	3.0*	36.2	5.5	35.7	4.1
CKMB	21.8	9.6	18.8	9.2	20.6	9.4	27.0	8.1*

LDH: Lactate dehydrogenase, CK: Creatine Kinase and CKMB: Creatine kinase-MB.
** There is a significant difference σ≤0,05*

The results of table (7) show the inflammation markers LDH, CK& CKMP.

It is evident that CVD patients showed LDH values (331.8- 383.3 U/L) which were higher than allowance (140- 280 U/L). High LDH value may indicate the inflammation in body or damage in one of important organs like heart or liver or cause the renal disease[25]. LDH was higher for females than the males, and for outpatients than for inpatients. Such results may be expected since medical case is usually more in the hospital than for the outpatients.

CK test measures the amount of enzyme called creatine kinase in blood. CK is a type of protein. The muscle cells in the body need CK to function. Levels of CK can rise after a heart attack, skeletal muscle injury or strenuous exercise. CK test may be used for indicate muscle damage [13]. Reference values of CK for healthy men are 55-170 U/L and females 30- 145 U/L, but the determined values were mostly less. Low CK indicates weakness of muscles strength and muscle atrophy.CK was lower for females than males.

Table (8): Comparison between male and female pattern consumption of macro nutrients regarding group study

	Outpatient				Inpatient			
	Male		Female		Male		Female	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Calories (Kcal)	3141.5	590.8	3723.15	527.2*	3727.5	787.9	3079.2	671.4
Protein (g)	137.8	41.6	160.8	33.3*	137.5	51.1	137.0	38.8
Fat (g)	99.81	31.0	135.9	30.4	114.3	41.0	79.51	34.9
Fiber (g)	136.02	3.5	19.2	5.3	18.3	3.9	20.4	4.3
Carbohydrates (g)	423.0	79.2	464.3	76.6	440.5	80.5	453.9	60.5

** There is a significant difference σ≤0,05*

Analysis of macronutrients taken from foods of CVD out- and inpatients according to gender, compared from DRI values. Total calories were estimated using DRI equations considering weight, height, and age; protein was given by DRI for males and females. Fat is estimated as 27.5% of total calories as suggested by DRI (25-30% of total calories). Carbohydrates are estimated as total calories- calories of protein+ fat [16].

Comparisons considering data from Table (8) revealed the following:

T. calories taken by all study members were mostly more than suggested by the DRI (considering age, height, weight, and gender). Also, in all cases (females' calories) inpatients females fed more calories than the male outpatients. These excess calories will be stored as fat in the body, which is not right for CVD members. All of study members, consumed more protein from food than DRI

allowance (137.8- 160.8 g/d), and this increased the load on kidneys function . As compared with DRI values, the taken fat was much lower than that estimated by DRI calculation [28]. Carbohydrates (except for outpatient males) were more than DRI suggestion, excess carbohydrates will be stored as fat in the body which is not good for CVD patients [32]. Also, fibers were more than that given by the DRI allowance [10]. The data presented in Table (8) revealed that more interest is needed, even for the inpatients, considering their food, since excess nutrients (calories, fat, protein, and carbohydrate) will be stones in the body of patients, and may aggravate their CVD.

Table (9): Comparison between male and female pattern consumption of minerals regarding group study

	Outpatient				Inpatient			
	Male		Female		Male		Female	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Sodium	7005.0	1730.2	7524.5	1527.0	6233.7	2363.5	5614.8	1405.5
Potassium	6110.2	905.1	5614.0	726.2*	5182.1	983.2	5586.6	1073.5
Calcium	2022.9	485.0	2106.8	706.7	1957.4	596.8	1715.0	720.5
Phosphorus	1902.3	448.4	2171.6	458.1*	1912.2	560.5	1911.4	540.3
Magnesium	332.8	62.5	367.4	62.2	336.0	70.4	364.3	87.6
Iron	33.6	5.9	34.2	4.7	30.8	6.9	31.6	5.2
Zinc	20.8	5.4	24.1	3.6*	19.7	6.6	20.2	4.6
Calcium DRI	202.3	48.5	210.7	70.7	195.7	59.7	171.5	72.0
Magnesium DRI	128.0	24.0	167.0	28.3*	129.2	27.1	165.6	39.8*
Iron DRI	245.4	43.0	116.4	15.9*	224.8	50.3	107.6	17.7*
Zinc DRI	297.2	77.4	492.6	72.7*	281.4	93.6	411.8	94.4*
Sodium DRI	1300	300	1300	330	1300	200	1300	220
Potassium DRI	4700	400	4700	420	4700	480	4700	410
Phosphorus DRI	700	60	700	65	700	68	700	70

** There is a significant difference σ≤0,05*

The results of table (9) show the mineral consumed by CVD patients as affected by gender and residence.

It obvious that the intake of Na was very high especially knowing that salt is actually harmful for CVD patients. Doctors always advise CVD patients to take very low salt, or even stop adding salt in food to avoid aggravation of CVD[21]. CVD patients consumed sodium which was (432- 579 times more than DRI allowance. Possibly due to lack of control, outpatients had taken much more Na than the inpatients, under the control of the hospital. The effect of gender was not found. Na had also some toxicity symptoms such as edema and acute hypertension [21]. From the results of Table (9), it is evident that Ca intake was much more than allowance. The percent increase of Ca than DRI values was (168.6-175.57& 163.12-142.9). Excess Ca intake may cause constipation, increased risked stone formation, kidney dysfunction [27], and interference with the absorption of the minerals [2]. Intake of Ca was more for outpatients than inpatients, possibly due to more control in the hospital. Phosphorus intake by CVD patients was much more than allowance. P of out- and inpatients were higher than allowance by 272 to 310 times. According to [12], excess P may draw calcium out of the body in being excreted[31]. No effect of gender or residence was noticed. According to DRI, values suggested for Mg of males is 420 mg/d, while for females 320 mg/d. It could be noticed in table (10) that Mg was not affected by gender. Moreover, Mg of males was 332.8- 1308 mg/d less than DRI (420 mg/d) and females (320 mg/d).

Deficiency symptoms of Mg are weakness, confusion of extreme muscles convulsions, spams muscle movements especially of eye for muscles, hallucinations and difficulty in swallowing, in children growth stage. Toxicity symptoms are not known, large doses may cause diarrhea [13]. Fe values for females were more than the males and the effect of residence was presented by lower Fe for inpatients than the outpatients and Mg was less among males than the females group. Nevertheless, were not marked. Deficiency of Fe has many symptoms such as lactose intolerance, increased led and cadmium poisoning, reduces immunity and weakness. Deficiency of Fe impaired activity, itching skin, pale nails, eye membranes, concave nails, reduce resistance to cold and inability to regulate body temperature [8]. Zn (19.7- 24.1 mg/d) was higher than DRI. Accordingly, Zn was more than DRI for all study sample members [19]. Zn was higher outpatients than the inpatients and for females than the males. % of DRI Zn values were 189.1, 301.3, 179.1, 252.5 for males and females of outpatients and inpatients group. Both zinc deficiency and zinc toxicity have many undesirable effects for health. Moreover, acidic foods or drinks that have been stored in zinc or coated may be toxic[9] . Essentially, food taken by outpatients and inpatients needs much control considering the minerals contents [11].

Table (10): Comparison between male and female pattern consumption of vitamins regarding group study

	Outpatient				Inpatient			
	Male		Female		Male		Female	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Vitamin A	1251.3	457.5	1085.0	640.5	865.6	404.3	714.8	417.0
Vitamin C	222.1	74.5	154.4	61.5*	171.7	75.3	219.9	134.1
Vitamin B1	1.6	0.3	1.5	0.4	1.6	0.3	1.6	0.3
Vitamin B2	2.6	1.5	2.7	1.3	2.3	1.2	2.0	0.8
Vitamin A DRI	500	76.2	700	128.1	500	67.4	700	83.4
Vitamin C DRI	90	165.5	75	136.6*	90	167.4	75	153.6
Vitamin B1 DRI	1.2	24.0	1.1	32.6	1.2	21.8	1.1	29.5
Vitamin B2 DRI	1.3	114.8	1.1	121.1	1.3	90.2	1.1	74.6

** There is a significant difference σ≤0,05*

Data of table (10) show the vitamin intake by members of study.

It is evident in table (10) that outpatients' intakes were (1251.3- 1085) more than allowance (500-700 mg/d), provided that males consumed more Vit A than the females. This was found for inpatients females, then in males where Vit A was more than DRI (700 mg/d). Both deficiency and toxicity cause marked undesirable symptoms [11]. We should avoid Vit A deficiency and Vit A toxicity for patients under control group. From results of table (10) it is evident that males had more vitamin A than females, regardless of residence, and outpatients consumed more vitamin A than inpatients group. Vitamin C intakes were more than DRI (90 mg/d) for males and (75 mg/d) for females. Serious side effects of too much vitamin C are very dangerous because the body cannot store the vitamin [28]. No problem can be faced for Vit B1 and Vit B2. Nearly all groups consumed 1.6 mg/d, except female outpatients who consumed 1.5 mg/d of B1. DRI recommendations are 1.2 mg/d for males and 1.4 mg/d for females. For Vit B2 all groups consumed 2.0- 2.7 more than the DRI (1.3 for males and 1.1 for females). Outpatients consumed more Vit B2 than the DRI. Actually, deficiencies are connected with certain diseases. In the present research, deficiencies are nearly not faced, and excess intake may be

pronounced symptoms in both Vit B1&B2 which are water-soluble vitamins [12].

4. Conclusion:

Cardiovascular disease is one of the primary causes of death globally, and its prevalence is on the rise. This presents an opportunity to enhance awareness of healthy nutrition practices that can benefit CVD prevention. It is essential to implement effective interventions to support these efforts.

Conflict of Interest

The authors declare that there is no conflict of interest.

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العناصر الغذائية التي يستهلكها مرضى القلب والأوعية الدموية الداخليون والخارجيون في مستشفيات محافظة القاهرة

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الملخص العربى:
تُعد أمراض القلب والأوعية الدموية السبب الرئيسي للوفاة على مستوى العالم، حيث تمثل ما يقرب من 30% من جميع الوفيات.أجريت هذه الدراسة بهدف فحص العلاقة المحتملة بين أمراض القلب والأوعية الدموية والتغذية لدى بعض المرضى الداخليين والخارجيين فى مستشفيات محافظة القاهرة. شارك فى البحث عينة من مائة مريض بالقلب من المرضى الداخليين والخارجيين من بعض المستشفيات فى القاهرة. تم تقسيمهم إلى مجموعتين، كل منهما 50 مريضًا من المرضى الداخليين والخارجيين وتم تقسيمهم بطريقة للحصول على 25 ذكرًا و25 أنثى متطابقين فى كل مجموعة. وقد أظهرت الدراسة أن كلا من الجنس والإقامة كان لهما علاقة بين العناصر الغذائية المستهلكة ونسبة الذكور والإناث المصابين بالمرض. كان هذا واضحًا بالنسبة لمؤشر كتلة الجسم ومحيط الخصر ومحيط الذراع ومستوي انزيم اللكتات ديهيدروجينيز والجليسيردات الثلاثية و الكوليسترول الدهنى المنخفض الكثافة ووظايف الكبد والهيموجلوبين وكرات الدم البيضاءو الصوديوم والكربوهيدرات والحديد والزنك وفيتامين أ.). أظهرت نسبة أمراض القلب والأوعية الدموية لدى المرضى الخارجيين ارتفاعًا في مؤشر كتلة الجسم ونسبة الكوليسترول في الدم ونسبة الكوليسترول في الدم ونسبة حمض البوليك ونسبة الكوليسترول في الدم والصوديوم. كانت نسبة الإناث أعلى في نسب مؤشر كتلة الجسم والكوليسترول الكلى و حمض البوليك والهيموجلوبين والصوديوم وناقلة أمين الالانين فى الدم. كانت نسب انزيم اللكتات ديهيدروجينيز والكرياتين كاينيزومحيط الخصر ومحيط الذراع والجليسيريدات الثلاثية ووظائف الكبد فى الذكور أعلى من الإناث . من المدهش وغير المقبول أن يتم التدخين فى مستشفيات أمراض القلب والأوعية الدموية. النسبة المئوية كارثية جدًا لمرضى القلب والأوعية الدموية بخصوص التدخين، وخاصة للمرضى المقيمين تحت سيطرة المستشفى. .

الكلمات الكاشفة: أمراض القلب، التدخين، الحالة الغذائية

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