Journal of Recent Advances in Medicine

Print ISSN: 2636-252X
Online ISSN: 2636-2538

Original Article

Risk factors profile of coronary artery disease among medical students at Al-Azhar University, Cairo

Community Medicine

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ABSTRACT

Background: Coronary artery disease (CAD) represents an increasing public health problem worldwide. Measuring CAD risk factors among young adults will be helpful in reduction and control of their future risk to CAD also and other cardiovascular disease (CVD).

Objective: To identify the pattern of CAD risk factors among Al-Azhar University medical students (males and females) of all educational grades.

Methodology: A comparative cross sectional study was conducted on 1142 (755 and 387) medical students at the Faculty of Medicine- Boys and Girls respectively-Al-Azhar University in Cairo. Data were collected through a self-administered questionnaire, anthropometric and blood pressure measurements were taken. Also, biochemical investigations for blood glucose and lipid profile were conducted on a subsample of 24% from total sample. SPSS version 20 was used for data analysis.

Results: The mean age of participants was 21.17±1.78 with males constituting two thirds of the sample. The majority of participants had at least one risk factor to CAD. The most prevalent risk factor of CAD was insomnia (73.5%) followed by consumption of carbonated beverages (62.3%) and fatty meat (46.4%). Also, stress (46.6%), overweight/or obesity (34.2%), physical inactivity (34%) and hypertension (19.5%) were predominant risk factors. Whereas, smoking prevalence was low (7.1%). Dyslipidemia was detected among 23% of the studied subsample.

Conclusion: CAD risk factors were highly prevalent among medical students. However, smoking was present only among males and with a low prevalence. Initiation of health educational programs to raise awareness about CAD risk factors and periodic screening programs to detect CAD risk factors are recommended.

JRAM 2022; 3(2):119-130

Keywords: Coronary artery disease, risk factors, medical students.

Submission Date: 5 November 2021 **Acceptance Date:** 17 December 2021

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Please cite this article as: Abd El-Gawad HN, El-Baz MZ, El-Deeb AF, El-Shenawy SI. Risk factors profile of coronary artery disease among medical students at Al-Azhar University, Cairo. JRAM 2022; 3(2):119-130. DOI: 10.21608/jram.2021.104011.1146

INTRODUCTION

Coronary artery disease is a serious and fast growing public health problem. It was detected among 1655 /100000 of the world population in 2017, which is expected to increase to more than 1845/100000 in 2030. Moreover, it is responsible for 9million deaths worldwide[1]. Egypt is experiencing an alarming rise in the occurrence and deaths from CAD. According to the National Hypertension Project the adjusted overall prevalence of CAD was 8.3%. Whereas, World health organization ranking showed that 23% of total deaths were attributed to CAD and the age adjusted death rate was 186.36/100000 which ranks Egypt number 23 in the world[2]. Although CAD primarily occurs in patients aged over 40 years, yet young men and women are affected. Several autopsy studies revealed that among young adults(<40 years) the prevalence of CAD ranged from (8%-20%) of all acute coronary events[3,4].

A potential age shift of CAD has been noticed among young adults with a global rise of its occurrence, may be related to increased urbanization and behavioral changes. Moreover, this burden is expected to grow due to continuous exposure to risk factors[5]. Many risk factors for CAD are established including age, gender, race and

family history. Often clustering together with other modifiable risk factors that include physical inactivity, unhealthy diet, stress, sleep disorders, smoking, excess body weight, hypertension, diabetes and dyslipidemia. Where control of these factors could reduce the risk of heart attack by up to 80%[6]. However, development of CAD risk factors early in life; is strongly associated with atherosclerotic changes that often persist into adulthood and can predict the future risk of CAD. Making it an ideal time to identify the magnitude and types of CAD risk factors to establish targeted interventions before disease occurrence through promoting a healthy lifestyle[7]. In spite of existing evidence of high prevalence of CAD risk factors among young adults, yet risk assessment and preventive measures are lacking[8].

In Egypt, to tackle the burden of non-communicable diseases the political authority lunched national initiative campaign called "100 million health lives" for early detection of obesity, hypertension and diabetes[9]. According to the Stepwise survey conducted among the adult population aged (15-69 years); the prevalence of CAD risk factors including low fruits and vegetables consumption, obesity, hypertension, physical inactivity, smoking, hypercholesterolemia and diabetes were 90%,35.7%,29.5%,24.9%,22.7%,19.2%and15.5% respectively[10]. Although the prevalence of CAD risk factors among young adults is underestimated yet, scanty studies were carried out and revealed that dyslipidemia, physical inactivity, excess body weight, smoking, hypertension, and diabetes were 68.9%[11],49%[12],38.6%[13],22%[14],2%[12]and 0.4%[13] to2%[12]respectively.

College years serve as a transitional period from adolescence to adulthood where students making their lifestyle choices and developing risky behaviors which could persist into adulthood and adversely affect their health[5]. So, universities form an ideal setting to reach a large number of young adults for early identification and prevention of CAD risk factors[15]. The aim of this work is to identify the pattern of CAD risk factors among Al-Azhar University medical students (males and females) of all educational grades.

SUBJECTS AND METHODS

Study design and setting

A comparative cross sectional study was conducted over a period of 16 months from October 2018 to January 2020 on a total sample of 1142 (755 and 387) medical students at Faculty of Medicine- for Boys and Girls respectively-Al-Azhar University in Cairo. A subsample of 24% from the total sample size was selected on which laboratory investigations were conducted.

Sampling technique

Sample type

A stratified random sample technique with proportional allocation from each educational grade of Faculty of Medicine-for Boys and Girls-at Al-Azhar University in Cairo was adopted. From each educational grade students were chosen by a systematic random sample technique. All students selected by the systematic random sample method were asked to participate in biochemical investigations; those who accepted were included in the studied subsample. The refusal rate was about 40%.

Sample size calculation

Sample size was calculated taking into consideration the prevalence of dyslipidemia (8.3%) among university students in Egypt[13]. And the degree of certainty (d) calculated at one fifth of the prevalence as the selected prevalence for sample size calculation was less than 10%[16]. It was calculated using the following formula "$n = Z^2 \times p \times q/d^2$ (n) is the sample size, (z) is the standard normal deviation of 1.96 which correspond to the 95% confidence interval, (p) is the prevalence of CAD risk factor, (q)= (1-p), (d) is the degree of certainty[17].

Study tools

A self-administered questionnaire including personal and socio-demographic data. Social class of participants was classified according to Fahmy and El Sherbini[18] into very low= <15, low=15to < 20, middle=20 to < 25 and high=25-30.

Risk factors of CAD

Dietary factors: Frequency of weekly consumption of vegetables, fruits, carbonated beverages fatty meat, processed meat, canned food and number of daily teaspoons of salt intake.

Physical activity level; was assessed by using the International Physical Activity Questionnaire (IPAQ) short form; students were asked to think about all activities they had done in the previous week (vigorous, moderate and walking). Participants were classified into three categories; low, moderate and high activity according to the IPAQ Research Committee[19].

Stress; was measured by using the perceived stress scale (PSS)[20], consisting of 10 items rated on a 5 point Likert scale. The total score ranged from (0-40) which categorized into low=0 to 13, moderate=14 to 26 and high=27-40.

Sleep disorder was evaluated according to Beckford[21] by insomnia severity index scale; consisting of 7 items measured in a 5-point likert scale. The total score ranged from (0-28) and classified into: non clinical insomnia=0–7, subclinical insomnia=8–14, moderate clinical insomnia=15–21and severe clinical insomnia=22–28.

Measurements

After completing the questionnaire, measurements were taken as described by D'Agostino, et al.[12] and included:

- **Weight and height: both were obtained from a lightly clothed student.**
- **Blood pressure (BP) measurement:** It was done while the student in the sitting position after 4 minute of rest. Systolic and diastolic blood pressure was identified at the beginning of the first and the fifth phase of the Korotkoff sounds using a mercury sphygmomanometer applying the appropriate cuff on the right arm [12].
- **Laboratory investigations:** blood sample was obtained from each participant from the antecubital vein after 12 hours of fasting. It was taken from the antecubital vein while the student in the sitting position. The biochemical evaluation was performed in the laboratory of KAUH and following the criteria of the World Health Organization Lipid Reference Laboratories. Upon arrival, the samples were centrifuged to obtain the plasma Levels of total cholesterol (TC), glucose and triglycerides (TG). They were measured by a chromatometric enzymatic method
- **Smoking history** (smoker or none-smoker).

Anthropometric and blood pressure measurements of the total sample were recorded:

Body weight was measured using Salter digital scale which was calibrated every morning using a standard weight. Subjects were asked to stand without shoes and in light clothes. Weight was recorded to the nearest 0.25 kg[22]. Height was measured with the subject standing upright without shoes, looking straight ahead with feet and heels together; height was recorded to the nearest 0.5 cm[22]. BMI was calculated by the formula=Weight (kg)/(Height in meter^2). According to WHO[23] criteria; BMI classified into underweight (<18.5), normal (18.5–24.9), overweight (25–29.9) and obese (≥30). Waist circumference (WC) was measured using non-stretchable tape at the midpoint between the lower border of last rib and iliac crest in horizontal plane on light clothes. WC was categorized into normal (<88 cm in females, <102cm in males) and abnormal (abdominal obesity) (≥88cm in females, ≥102cm in males)[24].

Blood pressure (BP) was measured by using a calibrated Alpk2 digital sphygmomanometer. Then measurement repeated after 5 minutes; the average of the two measurements was recorded. BP was defined and classified regarding SBP/DBP (mmHg) into: normal (<120/<80), elevated (120-129/<80), Stage I hypertension (130-139/80-89), Stage II hypertension (≥140/≥90)[25]. Normal and elevated BP considered as non-hypertensive while stage I and stage II considered as hypertension.

Biochemical investigations for the subsample were done in the form of:

- Non fasting lipid profile*:* A 3-ml of venous blood sample was obtained from students. Then samples were transported to the Laboratory at the faculty of medicine for girls at Al-Azhar University, Cairo. The samples were centrifuged and analyzed to obtain the plasma Levels of Triglyceride (TG), Total Cholesterol (TC), Low Density Lipoprotein (LDL) and High Density Lipoprotein (HDL). They were measured by the enzymatic colorimetric method using Spinreact kits. **(**High TG levels ≥200 mg/dl, high TC levels ≥240 mg/dl, high LDL levels ≥160 mg/dl)[26] and Low HDL (<40 mg/dl in males and <50 mg/dl in females)[27].
- Random blood glucose (RBG): By glucose check test using kits of Gluco-doctor; high RBG if serum glucose ≥200 mg/dl[28].

Ethical consideration

The study protocol was approved by the ethical committee at Faculty of Medicine (Girls), Al-Azhar University-Cairo and informed verbal consents from all participants was obtained.

Statistical analysis

After data collection, data entry then analysis by using SPSS program (version20) was done. Comparing between groups was done by Chi-square test (X^2) for qualitative data and student t-test for quantitative data. Logistic regression was done for analysis of factors affecting. The level of significance was taken at 0.05. So, Pvalue≤0.05 was significant.

RESULTS

The mean age of students in either males or females was the same being (21.22±1.8 and 21.07± 1.71 years respectively). Regarding the academic year 20% of males were in the third year while among females 22.7% were in the third and fourth year. The majority of students (70.5%&74.9%) were from high social class for males and females respectively. The previous differences were statistically insignificant except for differences in social class for either group (Table 1).

Nearly half of females (44.2%) compared to 28.7% of males had low physical activity levels. Also, mean values of leisure time were higher among females (8.714±3.8859) than males (6.443±3.2229). Additionally, more females (57.9%) had high stress levels than males (40.8%). Whereas, only 10.7% of males were smokers and all females were non-smokers (P≤0.05). Regarding insomnia; more females (30.5%) insignificantly had clinical insomnia than males (25.8%) (table 2).

Frequent consumption of fruits and vegetables (>3 times/week) were average being more for fruits (64.97%) than vegetables (48.5%). Females reported more frequent consumption of fruits than males. Whereas; consumption of carbonated beverages >3times/week was more among males (13.4%) than females (4.9%).Also, more males reported weekly consumption of fatty meat (52.5%) and processed meat (32.3%) versus 34.9% and 15%

respectively among females. Similarly, weekly consumption of canned food was more among males (60.9%) than females (47%). Whereas, more females (47.3%) consumed excess table salt (>1 teaspoon) than males (39.2%) (table 3).

Overweight and obesity were more or less similar in either gender being (34.8%& 8.5%) for males respectively versus (33.1%&10.1%) among females for the corresponding figures. However, abdominal obesity was more among females (16%) than males (7.3%). Regarding BP; more males (24.9%) significantly had hypertension than females (9%) (table 4). Although males and females were more or less similar in having a cluster of ≥4 CAD risk factors (30.5% and 30.7% respectively). Yet, more females (32.3%) had a cluster of three risk factors than males. Whereas, more males (29.5%) had a cluster of two CAD risk factors versus than females (P≤0.05) Figure(1).

The mean values of TG were significantly higher among males (112.03±62.12 mg/dl) than females (65.637±42.81 mg/dl).Whereas, the mean values of LDL were significantly higher among females (100.78±45.70 mg/dl) than males (88.54±34.89 mg/dl). Also, the mean values of RBG (104±15.85 mg/dl), TC (171.73±49.16 mg/dl) and HDL (59.27±14.18 mg/dl) were insignificantly higher among females compared to (101.5±14.421 mg/dl),(168.10±36.354 mg/dl) and (56.58±11.02 mg/dl) respectively among males (table 5).

In the studied subsample; more males (11.7%) had high TG levels than females (3.3%). Whereas, more females had high levels of TC (7.7%), LDL (9.9%) and low HDL levels (26.4%) compared to (3.4%), (2.8%) and (2.8%) respectively among males with a statistical significant difference, except for TC which was statistically insignificant. Also, more females (35.2%) significantly had dyslipidemia than males (16.8%) (table 6).

The significant covariates associated with a higher risk of hypertension using logistic regression were smoking, abdominal obesity, overweight/obesity, male gender and stress. High physical activity levels were insignificant covariate associated with hypertension but its strength as a risk factor was low. Female gender was a significant covariate associated with a higher risk of dyslipidemia. Although abdominal obesity and overweight/obesity were insignificant covariates affecting dyslipidemia, yet their strength as risk factors was high (table 7).

Table (1): Sociodemographic characteristics in relation to gender among the total sample

Gender / Characteristics	Male (n=755)	Female(n =387)	Total (n=755)	Stat. tests
	n (%)	n (%)	n (%)	
Age in years - Mean ± SD	21.22 ± 1.8	21.07 ± 1.71	21.17±1.78	t test = 1.286 P= 0.199
Origin				
- Urban	160 (21.2%)	88 (22.7%)	248 (21.7%)	χ 2 = 1.212 P=0.27
- Suburban**	135 (17.9%)	60 (15.5%)	195 (17.1%)	
- Rural	460 (60.9%)	239 (61.8%)	699 (61.2%)	
Academic year				
- First	115 (15.2%)	48 (12.4%)	163 (14.3%)	χ 2 = 1.157 P=0.06
- Second	113 (15%)	39 (10.1%)	152 (13.3%)	
- Third	152 (20.1%)	88 (22.7%)	240 (21%)	
- Fourth	124 (16.4%)	88 (22.7%)	212 (18.6%)	
- Fifth	140 (18.5%)	74 (19.1%)	214 (18.7%)	
- Sixth	111 (14.7%)	50 (12.9%)	161 (14.1%)	
Social class				
- Very low social class	57 (7.5%)	8 (2.1%)	65 (5.7%)	χ 2 = 16.59 P=0.001*
- Low social class	54 (7.2%)	21 (5.4%)	75 (6.6%)	
- Middle social class	112 (14.8%)	68 (17.6%)	180 (15.8%)	
- High social class	53 (70.5%)	290 (74.9%)	882 (71.9%)	

*Significant p-value , **Suburban is defined as small towns with low density. They are either part of a city or urban area, or exist as a separate residential community within commuting distance of a city.

Table (2): Life style risk factors for coronary artery disease in relation to gender among the total studied sample

Gender / Life style risk factors	Male (n =755) n (%)	Female (n=387) n (%)	Total (n =1142) n (%)	Stat. tests
Physical activity levels				
- Low physical activity	217 (28.7%)	171 (44.2%)	388 (34%)	χ^2 = 35.255
- Moderate physical activity	414 (54.8%)	187 (48.3%)	601 (52.6%)	P= 0.001*
- High physical activity	124 16.4%)	29 (7.5%)	153 (13.4%)	
Leisure time in hours**				t test=10.49
Mean ± SD	6.443 ±3.2229	8.714 ± 3.8859	7.213 ± 3.623	P= 0.001*
Stress levels				
- Low	150 (19.9%)	50 (12.9%)	200 (17.5%)	χ^2 = 30.412
- Moderate	297 (39.3%)	113 (29.2%)	410 (35.9%)	P=0.001*
- High	308 (40.8%)	224 (57.9%)	532 (46.6%)	
Sleep disturbance (insomnia score)				
- Non clinical insomnia	200 (26.5%)	103v(26.6%)	306 (26.5%)	χ^2 = 3.305
- Subclinical insomnia	360 (47.7%)	166 (42.9%)	526 (46.1%)	P= 0.192
- Clinical insomnia	195 (25.8%)	118 (30.5%)	313 (27.4%0	
Smoking				
- Non smokers	674 (89.3%)	387 (100%)	1061 (92.9%	χ^2= 44.69
- Smokers	81 (10.7%)	0 (0%)	81 (7.1%)	P=0.001*

*Significant P-value, ** Leisure time is time of watching television, playing computer games, reading, and listening to music.

Table (3): Dietary habits in relation to gender among the total studied sample

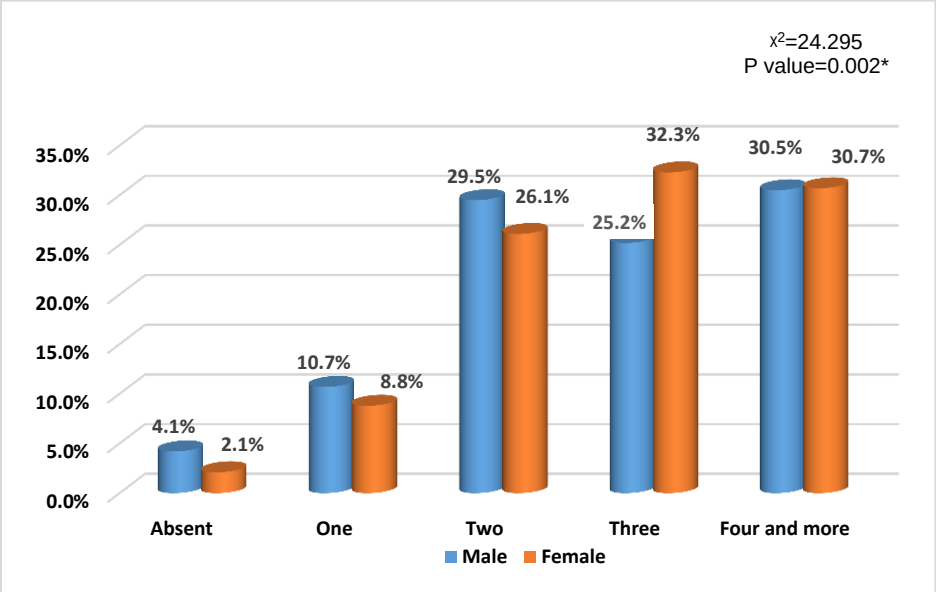
Gender / Dietary pattern	Male (n= 755) n (%)	Female (n =387) n (%)	Total (n =1142) no. (%)	Stat. tests
Consumption of fresh vegetables				
- Rare	76 (10.1%)	44 (11.4%)	120 (10.5%)	χ^2 =.482
- ≤ 3 times/week	312 (41.3%)	156 (40.3%)	468 (41%)	P =0.786
- > 3 times/week	367 (48.6%)	187 (48.3%)	554 (48.5%)	
Consumption of fresh fruits				
- Rare	25 (3.3%)	24 (6.2%)	49 (4.3%)	χ^2 = 10.988
- ≤ 3 times/week	252 (33.4%)	99 (25.6%)	351 (30.7%)	P =0.004*
- > 3 times/week	478 (63.3%)	264 (68.2%)	742 (65%)	
Drinking carbonated beverages				
- Rare	237 (31.4%)	193 (49.9%)	430 (37.7%)	χ^2 = 45.61
- ≤ 3 times/week	417 (55.2%)	175 (45.2%)	592 (51.8%)	P =0.001*
- > 3 times/week	101 (13.4%)	19 (4.9%)	120 (10.5%)	
Consumption of fatty meat				
- Rare	359 (47.5%)	252 (65.1%)	611 (53.5%)	χ^2 = 33.812
- ≤ 3 times/week	366 (48.5%)	130 (33.6%)	496 (43.4%)	P =0.001*
- > 3 times/week	30 (4%)	5 (1.3%)	35 (3.1%)	
Consumption of processed meat				
- Rare	511 (67.7%)	329 (85%)	840 (73.6%)	χ^2= 39.518
- ≤ 3 times/week	226 (29.9%)	54 (14%)	280 (24.5%)	P =0.001*
- > 3 times/week	18 (2.4%)	4 (1%)	22(1.9%)	
Consumption of canned food				
- Rare	295 (39.1%)	205 (53%)	500 (43.8%)	χ^2 = 20.328
- ≤ 3 times/week	337 (44.6%)	137 (35.4%)	474 (41.5%)	P =0.001*
- > 3 times/week	123 (16.3%)	45 (11.6%)	168 (14.7%)	
Visible salt/day				
- ≤1 teaspoon	459 (60.8%)	204 (52.7%)	663 (58.1%)	χ^2 = 6.862
- >1 teaspoon	296 (39.2%)	283 (47.3%)	479 (41.9%)	P= 0.009*

*Significant p-value (≤.05).

Table (4): Anthropometric and blood pressure measurements in relation to gender among the total studied sample

Gender / Risk factor	Male (n = 755) n (%)	Female (n = 387) n (%)	Total (n = 1142) n (%)	Stat. tests
BMI (kg/m^2) - Mean ±SD	24.92 ± 3.96	24.76 ± 3.73	24.86 ± 3.89	t-test =.673 P =0.501
Body mass index category - Normal - Over weight - Obese	428 (56.7%) 263 (34.8%) 64 (8.5%)	220 (56.8%) 128 (33.1%) 39 (10.1%)	648 (56.7%) 391 (34.2%) 103 (9%)	χ^2 = 1.728 P =0.631
Waist circumference (cm) - Mean ±SD	85.03 ± 10.22	79.60 ±8.59	83.19 ± 10.028	t-test=8.956 P =0.001*
Waist circumference category - Normal - Abnormal	700 (92.7%) 55 (7.3%)	325 (84%) 62 (16%)	1025 (89.8%) 117 (10.2%)	χ^2 = 52.902 P =0.001*
Blood pressure in mmHg - Systolic Mean ±SD	119.88 ± 9.95	114± 10.257	117.89 ± 10.43	t-test= 9.344 P=0.000*
- Diastolic Mean ±SD	78.71 ± 8.13	75.13 ± 8.28	77.5 ± 8.347	t-test= 7.003 P= 0.001*
Category of blood pressure - Normal - Pre-hypertension - Hypertension	520 (68.9%) 47 (6.2%) 188 (24.9%)	342 (88.4%) 10 (2.6%) 35(9%)	862 (75.5%) 57 (5%) 223 (19.5%)	χ^2 =52.79 P= 0.001*

*Significant p-value.



*Significant P-value (≤.05), N.B. Risk factors included were physical inactivity, stress, insomnia, smoking, overweight/obesity, abdominal obesity and hypertension.

Figure (1) Clustering of CAD risk factors in relation to gender among the total sample

Table (5): Mean values of biochemical investigations in relation to gender among the studied subsample

Gender / Risk factors	Male (n=179) Mean ±SD	Female (n=91) Mean ±SD	t-test	P value
Triglyceride (mg/dl)	112.03 ± 62.12	65.637 ± 42.81	6.391	0.001*
Total cholesterol (mg/dl)	168.10 ± 36.354	171.73 ± 49.16	.685	0.494
Low density lipoprotein (mg/dl)	88.54 ±34.89	100.78 ± 45.70	2.446	0.014*
High density lipoprotein (mg/dl)	56.58 ± 11.02	59.27 ± 14.18	1.27	0.083
Random blood glucose (mg/dl)	101.5 ±14.421	104 ± 15.85	1.300	0.195

*Significant p-value , **N.B.** diabetes mellitus wasn't detected among the studied subsample.

Table (6): Pattern of lipid profile in relation to gender among the studied subsample

Gender / Lipid profile	Male (n=179) n (%)	Female (n =91) n (%)	Total (n =270) n (%)	Stat. tests
Level of TG				
- Normal	158 (88.3%)	88 (96.7%)	246 (91.1%)	χ^2 =5.30
- High	21 (11.7%)	3 (3.3%)	24 (8.9%)	P= 0.02*
Level of TC				
- Normal	173 (96.6%)	84 (92.3%)	257 (95.2%)	χ^2 =2.48
- High	6 (3.4%)	7 (7.7%)	13 (4.8%)	P=0.115
Level of LDL c				
- Normal	174 (97.2 %)	82 (90.1%)	256 (94.8%)	χ^2 = 6.180
- High	5 (2.8%)	9 (9.9%)	14 (5.2%)	P=0.01*
Level of HDL c				
- Normal	174 (97.2%)	67 (73.6%)	241 (89.3%)	χ^2 =34.99
- Low	5 (2.8%)	24 (26.4%)	29 (10.7%)	P=0.001*
Dyslipidemia**				
- Absent	149 (83.2%)	59 (64.8%)	208 (77%)	χ^2 = 11.55
- Present	30 (16.8%)	32 (35.2%)	62 (23%)	P= 0.001*

*Significant p-value, ** Dyslipidemia at least one form of abnormal lipid profile, **N.B.** Diabetes mellitus wasn't detected among the studied subsample,

Table (7) Logistic regression of some risk factors affecting hypertension and dyslipidemia among participants

Items	B Coefficient	Wald	P value	Odds ratio	95% C.I. for odds ratio	
					Lower	Upper
Risk factors affecting hypertension**						
- Smoking	1.976	51.187	0.001*	7.213	4.198	12.394
- Abdominal obesity	1.428	29.277	0.001*	4.170	2.486	6.994
- Gender	1.379	36.009	0.001*	3.971	2.531	6.230
- Stress	0.766	9.424	0.002*	2.151	1.319	3.508
- Overweight/obesity	0.659	12.895	0.001*	1.933	1.349	2.770
- High physical activity level	-0.085	1.087	0.768	0.918	0.522	1.615
- Constant	-3.798	120.90	0.001	0.022		
Risk factors affecting dyslipidemia***						
- Gender	0.774	6.171	0.013*	2.168	1.177	3.991
- Abdominal obesity	0.773	3.332	0.068	2.165	0.945	4.963
- Overweight/obesity	0.414	1.511	0.219	1.513	0.782	2.926
- Constant	-1.866	49.327	0.001	0.155		

*Significant p-value, **Logistic regression for hypertension was conducted among the total sample, ***Logistic regression for dyslipidemia was conducted among the studied subsample. **N.B.** Cut off point SBP/DBP ≥130/≥80 mmHg; (hypertension group included stage I and stage II hypertension).

DISCUSSION

Coronary artery diseases is responsible for half of cardiovascular mortalities and considered the leading cause of death among young adults. More than half of young adults have at least one risk factor to CAD which increases the long-term risk of heart disease [29].

The present study revealed that; one third of the studied sample had low physical activity, with females more significantly inactive than males. Whereas, 13.4% were highly active; being higher among males than females. In accordance, Naim et al.[30] in Malaysia found that 39.5% of university students were physically inactive. On the contrary, Abd El-Aty et al.[31] in Assuit governorate, Egypt found that 14.3% of university students were physically inactive whereas, 44.1% were highly active.

In the present study the lower physical activity among females may be related to behavioral and sociocultural barriers imposed on females with the majority being from a rural culture. The transition to university life may be associated with an increased autonomy over food choices, small food budgets and exposure to new social groups and food culture. Unhealthy dietary patterns were noticed among the studied participants.

In the present work; the weekly consumption of fatty and processed meat was reported by 46.4% and 26.5% of all participants respectively being significantly more among male group. Similarly, Hadjimbei et al.[32] in Cyprus found that a quarter of university students consumed processed meat. In contrast, Salameh et al.[33] in Lebanon reported that the majority of university students

consumed processed meat weekly. The higher consumption of fatty meat in the studied sample could be related to palatability, food habits and culture as the majority of students were from rural area while consumption of processed meat may be due to its ease preparation and food preference.

The current study revealed that 42% of students reported excess daily consumption of frank table salt (>1 teaspoon) being higher among females than males. Whereas, weekly consumption of canned food (invisible salt) was reported by 56% of students; being significantly more among males. In agreement, Drury et al.[34] in USA found that more than half of university students consumed canned food. The findings of the present work may be a reflection of the Egyptian culture which is a salt loving culture.

In the existing work nearly two thirds of all participants consumed carbonated beverages weekly where only 10.5% reported a higher frequency of consumption being more among males. In agreement Salameh et al.[33] in Lebanon found that the majority of university students consumed carbonated beverages. On the contrary, Tapera et al.[35] in Botswana found that nearly one third of university students consumed carbonated beverages. The present study findings may be related to its availability inside the vicinity of campus at a suitable price.

In the present work frequent weekly consumption of fruits and vegetables was average being more for fruits (64.97%) than vegetables (48.5%). Females reported more frequent consumption of fruits than males. In accordance El-Kassas et al.[36] in Lebanon found that nearly two thirds of university students reported frequent consumption of fruits. In contrast, El-Ansari et al.[37] in Finland reported that the majority of university students reported frequent consumption of fruits and vegetables. The current study findings may be related to; although fruits and vegetables consumption were more among rural culture from which the majority of students come from yet, most of them resided in the university hostel with unavailable refrigerators to preserve food, thus making it difficult to keep fruits and vegetables in a fresh state.

The current study found that nearly half of the participants had high stress; being significantly higher among females than males. This agreed with Moutinho et al.[38] in Brazil and Zamroni et al.[39] in Malaysia who found that nearly half of medical students suffered from stress. The finding of the present study may be explained by; medical students are exposed to work overload in a competitive manner with a constant pressure of examinations and regular assessment[40].

Medical students are vulnerable to poor sleep quality due to academic demands[41]. The current work revealed that the majority of students had insomnia with nearly half presenting with subclinical insomnia and only fourth with clinical insomnia. Similarly Alqudah et al.[42] in Jordan found that the majority of medical students had insomnia with half presented with subclinical insomnia and a quarter as clinical insomnia. The high figure of insomnia among the studied sample may be due to complexity of learned subjects and multiple examinations which require all-night studying.

The present study showed that smoking was present among 7.1% of the total sample. It was found among 10.7% of males and absent among females. In accordance, Eid et al.[43] in Helwan, Egypt found that 8.6% of university students were smokers. Whereas, Ibrahim et al.[44] in India reported that a quarter of medical students were smokers.

In the present study the absence of smoking among females may be due to conservative cultural traditions which reject females smoking habits especially that the majority of them belong to the rural culture. Obesity is recognized as rising epidemic throughout the world affecting all age groups. The risk of heart disease increases by 4% for each increase in BMI[45].
In the current study one third of the total sample were overweight whereas, 9% were obese. In addition, only 10.2% of all participants had abdominal obesity being significantly higher among females than males. Similarly, Abdel-Wahed et al.[11] in Fayoum governorate, Egypt found that 30.2% of university students were overweight and 13% were obese. Also, Barbosa et al.[46] in Brazil found that 13.7% of university students had abdominal obesity. The figures of overweight/obesity among the studied sample could be attributed to student's exposure to busy schedule of college hours, poor dietary habits and physical inactivity. While abdominal obesity was more among females may be related to they experienced higher stress and more sedentary life. Medical students are prone to stress and unhealthy lifestyles making them at a higher risk of hypertension [47].

In the present study on measuring BP; 19.5% of all participants were hypertensive whereas, pre-hypertension was recorded among 5% being significantly higher among males than females. Also, the current work revealed that stress, smoking, overweight/obesity and abdominal obesity were significant predictors of hypertension. In accordance, Hujová[48] in Slovakia and Tanu Midha et al.[47] in India found that 18% of university students had hypertension with higher figures among males. Also, Moussa et al.[49] in Port-Said and Damietta Cities, Egypt reported significant association between hypertension, stress, smoking and obesity among university students.

In the current study the high figures of hypertension among males may be attributed to higher consumption of salty foods in the form of canned food and processed

meat among males than females. Dyslipidemia is a major risk factor for CAD where elevated cholesterol levels in early adulthood increased the lifetime risk of CAD[50].

In the studied subsample, nearly a quarter of participants (23%) had dyslipidemia; being significantly higher among female students. Similarly, Shawar et al.[50] in Oman found that a quarter of university students had dyslipidemia. Also, the studied subsample showed that more males had high TG levels while more females had high LDL and low HDL levels. Similarly, Ofori et al.[51] in Ghana found that more female university students than males had high figures of abnormal LDL and HDL levels.

In the present work the high figures of dyslipidemia among females may be related to their high figures of physical inactivity stress and abdominal obesity which was associated with a two times risk of dyslipidemia (OR=2.165).

Finally, the current study revealed that the majority of the studied sample had at least one CAD risk factor. This may be due to during college years, students experienced changes in their lifestyle choices like dietary habits and practicing sports. Also, the transition to a new environment with lack of social support interferes with engagement in healthy lifestyle.

Limitation of the study: Some of students were uncooperative to complete the questionnaire. Also, it was difficult to persuade some students for biochemical investigations. Lifestyle risk factors were self-reported so, the extent of under or over reporting can't be determined.

Conflict of interest: the authors declare that they have no competing interests.

Financial support: this work not funded from any governmental or non-governmental agencies

CONCLUSION

From previous work, it could be seen that among the total studied sample, the pattern of lifestyle was not ideal where, the majority of students reported insomnia. Also, nearly half of students suffered from stress. Also, one third were physically inactive; being higher among females, whereas smoking was low (7.1%) present among males only. Also, about one third were overweight/obese and one fifth had hypertension. In addition, nearly one quarter of the subsample had dyslipidemia. Implementation of screening programs for CAD risk factors among university students and application of intervention programs for those at higher risk. Health education programs to raise the awareness of college students about CAD risk factors and to encourage them to adopt healthy lifestyle.

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الملخص العربي

ملف عوامل الخطورة المؤدية للإصابة بمرض الشريان التاجى بين طلاب كلية الطب- جامعة الأزهر بالقاهرة

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ملخص البحث

الخلفية:: يعد مرض الشر يان التاجي مشكلة صحية عامة متزايدة في جميع أنحاء العالم. ويلعب قياس عوامل الخطورة للإصابة بمرض الشريان التاجي بين الشباب دورا مهما في الحد من خطر الإصابة بأمراض القلب والأوعية الدموية والسيطرة عليها في المستقبل.

الهدف: الهدف من هذه الدراسة هو التعرف على نمط عوامل الخطورة للإصابة بمرض الشريان التاجي لدى طلاب كلية الطب (بنين وبنات) بالفرق الدراسية المختلفة في جامعة الأزهر.

الطرق: كانت هذه الدراسة دراسة مقطعية مقارنة اجريت على 1142 طالب جامعي (755 و 387) بكلية الطب- للبنين والبنات على التوالي بجامعة الأزهر بالقاهرة. تم جمع البيانات عن طريق استبيان تم ملؤه ذاتيًا ، وتم اخذ قياسات الجسم و ضغط الدم. كما تم إجراء التحاليل لنسبة الجلوكوز والدهون في الدم على 24% من العينة الكلية . تم استخدام الحزمة الاحصائية للعلوم الاجتماعية لإدخال البيانات وتحليلها .

النتائج: كان متوسط عمر المشاركين 21.17 ± 1.78 ويشكل الذكور ثلثي العينة الكلية. وجد أن معظم المشاركين لديهم على الأقل عامل خطورة للإصابة بمرض الشريان التاجي. كما وجد ان اكثر عوامل الخطورة للإصابة بمرض الشريان التاجي هو الأرق بنسبة (73.5٪) يليه استهلاك المشروبات الغازية (62.3٪) واللحوم الدسمة (46.4٪). ايضا، التوتر وجد بنسبة (46.6٪) يليه زيادة الوزن / أو السمنة (34.2٪) ثم قلة النشاط البدني (34٪) ، وارتفاع ضغط الدم (19.5٪). بينما كان انتشار التدخين منخفضًا بنسبة (7.1٪) فقط. تم تشخيص ارتفاع نسبة الدهون في الدم بين 23٪ من العينة الفرعية.

الاستنتاجات: تشير هذه النتائج الى ان عوامل الخطورة للإصابة بمرض الشريان التاجي توجد بشكل كبير بين طلاب كلية الطب. ومع ذلك، كان التدخين موجودًا بنسبة منخفضًه بين الذكور فقط. لذا يوصى بالبدء في برامج التثقيف الصحي لرفع مستوى الوعي حول عوامل الخطورة للإصابة بمرض الشريان التاجي وكذلك برامج الفحص الدوري للكشف المبكر عن هذه العوامل.

الكلمات المفتاحية: أمراض الشرايين التاجية ، عوامل الخطر ، طلاب الطب.

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