Lifestyle Behaviours as a Risk Factor for Cardiovascular Disease Among University Students in Kirkuk Province

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Annotation: Cardiovascular disease (CVD) remains the leading cause of mortality worldwide, having several risk factors. Key risk factors include smoking, diabetes, high blood pressure, a high-fat diet, and a sedentary lifestyle. These risks, when present in young adults, can predict long-term CVD development. Early identification of at-risk individuals is crucial to promoting lifestyle changes before the disease advances. Current study aims to evaluate the prevalence of CVD risk factors among university students in Kirkuk, Iraq. A total of 866 students were randomly selected to participate, with data collected via a questionnaire covering sociodemographic variables and CVD risk factors. Assessed parameters included body mass index, blood pressure, random blood glucose, physical activity, sleep patterns, and smoking with dietary habits. The findings indicated that male students had a higher prevalence of risk factors than females, with smoking, lack of physical activity, irregular sleep patterns, and unhealthy diets being the most common. Notably, one-third of participants exhibited three or more risk factors. To address this, intervention programs should be initiated to enhance students' awareness of CVD risk factors and promote increased physical activity.

Introduction

Non-communicable diseases (NCDs) are main cause of death in worldwide and specifically in developed countries due to the significant reduction of infectious diseases, now accounting for the majority of global mortality [1,2]. Cardiovascular diseases (CVD), diabetes mellitus (DM), and hypertension, rank among the top causes of death [1]. The toll from cardiovascular diseases is immense, both in terms of lives lost and the financial burden related to tertiary care [3].

In Iraq, lifestyle changes, driven by socioeconomic improvements such as urbanization, increased access to better food, and rising disposable income, have contributed to the rise of diseases typically associated with more affluent societies, including cancer, coronary heart disease (CHD), diabetes, and obesity [4,5,6]. If unhealthy behaviors persist, particularly among younger populations, chronic NCDs will become even more widespread [1,3]. Extensive epidemiological research over the past 25 years has shown a strong link between CVD risk factors that begin in childhood and continue into adulthood [7,8]. These factors are directly connected to the severity of cardiovascular diseases in adulthood [9].

A study on the prevalence of CVD in Iraq found that coronary heart disease (CHD) accounts for one of the highest rates of mortality. CHD caused 26% of all deaths, with 27% of male and 23.5% of female deaths attributed to the disease. In patients with acute myocardial infarction frequent risk factors included smoking, high blood pressure, and diabetes [10,11].

Research indicates that a single risk factor might not be enough to develop CVD. Instead, the accumulation of multiple risk factors over time increases the likelihood of disease development. Presence of three or more risk factors was linked to a (2.4) fold increased risk for CHD in men and a 5.9-fold increase in female, over a 16-year follow-up period. Additionally, three or more risk factors accounted for around 48% of coronary events in women and 20% in men [12,13].

It has been well-established that high fat meal consumption, lack of physical activity and smoking are modifiable independent risk factors for CVD, as they stem from lifestyle choices [14]. Studies in Iraq have shown an increasing prevalence of smoking, obesity, hypercholesterolemia and diabetes mellitus still continue [15]. Maintaining the health of teens is a critical aspect of primary health care (PHC), and many of the leading causes of death and disability among adults are preventable through routine health maintenance, such as screening, counselling, and chemoprophylaxis [16]. However, there is limited data on CVD risk factors among younger populations, particularly university students in Kirkuk, Iraq. Estimating the disease burden in younger age groups will help create approaches to manage and prevent CVD risk factors.

Materials and Methods

A cross-sectional study conducted in universities in Kirkuk, Iraq, involving a total of 866 students.

Data Collection Methods

Interviewer-administered questionnaire used to collect the data. The questionnaire covered sociodemographic factors (age, gender, college category, and academic year), dietary patterns, body mass index (BMI), physical activity, sleep patterns and smoking, which are identified as major risk factors for CVD [17].

Physical Measurements

Students' weight and height were recorded to calculate BMI. Weight was measured in kilograms (kg), and height in centimeters (cm). BMI was calculated as weight (in kilograms) divided by the square of height (in meters). Categories were defined as: underweight (<18.5 kg/m²), normal weight (18.5-24.99 kg/m²), overweight (25-29.99 kg/m²), and obesity (≥30 kg/m²) [18].

Blood Pressure Measurement

Blood pressure (BP) was measured using electronic sphygmomanometer. The students were seated for 5 minutes at least before the measurement. Three BP readings were taken, and the average was recorded. BP classification was based on the guidelines from the Seventh Report of the Joint National Committee (JNC7) [19].

Blood Glucose Measurement

Random blood glucose (RBG) levels were measured using students capillary blood, with a one-touch glucometer. An RBG level below 140 mg/dL was considered normal [20].

Statistical Analysis

Data collected was checked for accuracy, using the Statistical Package for Social Sciences (SPSS) software, version 26. Descriptive statistics were generated for all variables. The Chi-square test was applied, and a p-value <0.05 was considered statistically significant throughout the study.

Results

Table (1) demonstrate the distribution of demographic characteristics of sample of universities students. The finding indicated that 68.7% of sample are males, mean age of the participant students were 21.59±2.7 SD, 25.1% of them at 2nd academic year. The finding indicated that 55.1% of sample have normal weight status. 85.3% of the samples resident in the city. Moreover, 26.8% of the samples have family history of diabetes and 36.7% have family history of hyper blood pressure.

**Table (1) distribution of demographic characteristics of sample**

	n	Mean	SD
Age	866	21.59	2.793
BMI	866	24.713	12.38
		n	**%**
Male		595	68.7
Female		271	31.3
BMI Classification			
Under weight		53	6.1
Normal weight		477	55.1
Over weight		280	32.3
Obese		56	6.5
Year of studying			
1st Year		199	23.0
2nd Year		217	25.1
3rd Year		152	17.6
4th Year		210	24.2
5th Year		88	10.2
Residential			
City resident		739	85.3
Village resident		127	14.7
family history of D.M			
Yes		232	26.8
No		634	73.2
family history of Hypertension			
Yes		318	36.7
No		548	63.3
father's education			
illiterate		169	19.5
primary		88	10.2
secondary		168	19.4
graduate		441	50.9
mother's education			
illiterate		317	36.6
primary		106	12.2
secondary		141	16.3
graduate		302	34.9

Table (2) shows relationship between sex and health parameter. There is significant statistical relationship between gender and blood pressure, smoking and physical activity at p-value (less than 0.000 in all of them). The finding indicated that , 88.6% have normal blood pressure, 97.9% have normal random blood glucose, 58.4% do not smoking, 51.8% have physical activity, 65.7% have normal sleep hours (7-8 hours per day), 93.1% have healthy food pattern.

Table (2) relationship between sex and sociodemographic and health parameter.

	n	%	male	female	*p*
Blood pressure					
Normal blood pressure	764	88.6	507	257	0.000
Abnormal blood pressure	102	11.8	88	14	
Random Blood glucose					
Abnormal blood glucose	18	2.1	11	7	0.320
Normal blood glucose	848	97.9	584	264	
Smoking					
Smokers	360	41.6	338	22	0.000
Non smoking	506	58.4	257	249	
Exercise					
Active life	449	51.8	354	95	0.000
Sedentary life	417	48.2	241	176	
Healthy diet consuming					
Yes	806	93.1	554	252	0.526
No	60	6.9	41	19	
Sleep pattern					
normal	569	65.7	384	185	0.160
abnormal	297	34.3	211	86	

Figure (1), demonstrated percentage of each risk factors distribution in both sexes, the male students having more risk factors than female students (74.1% and 25.8% respectively of all risk factors), the smoking, abnormal blood pressure and abnormal weight were more predominant (93.8%, 86.2% and 77.6% respectively of overall CVD risk factors of male students comparing to female students). While male students sleep behaviour, unhealthy diet consuming, random blood glucode and physical activity percentage were as (71%, 68.3%, 61.1% and 57.7% respectively). On the other hand, for female students, the lack of physical activity, abnormal random blood glucose and unhealthy diet consuming recorded the highest predisposing CVD risk factors (42.2%, 38.8% and 31.6% respectively of overall CVD risk factors). The lowest percentage of CVD risk factors were for female of abnormal sleep pattern, abnormal weight, abnormal blood pressure and smoking (28.6%, 22.3%, 13.7% and 6.1% respectively).
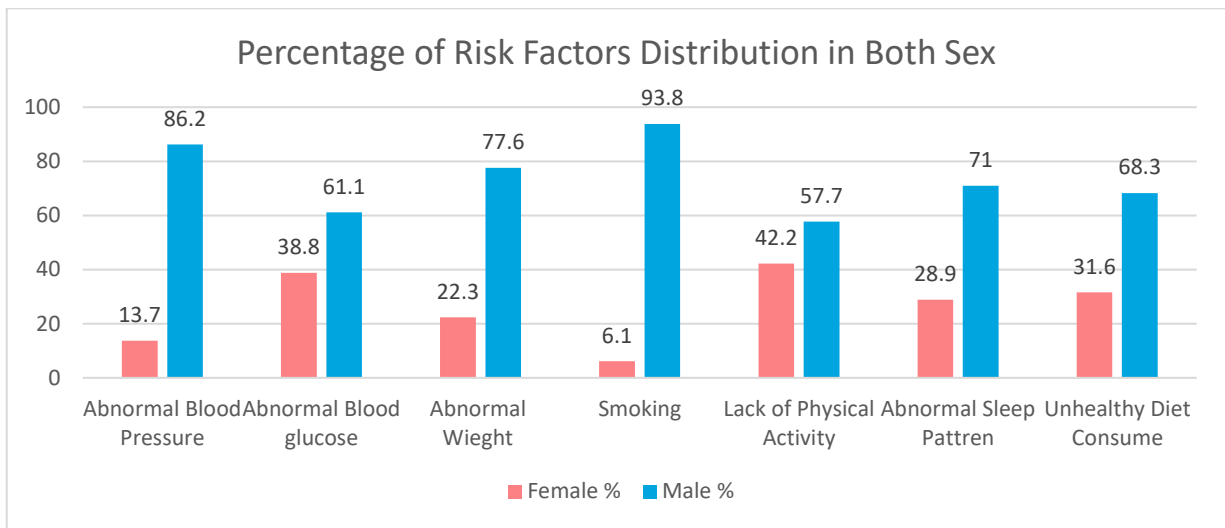
Figure (1) Percentage of over all predisposing CVD risk factor according to sex, the number represent percentage of each risk factor distribution in both sex.

The accumulation of risk factors per person shows significant differences between male and female. As more than third percent (36%) of male students comparing to only (11%) of female students have accumulation of 3 and more risk factors (p value < 0.000). While around (30%) of male and (39%) of female have 2 risk factors. The remaining cases shows 1 or 0 risk factor, (31%) male and (50%) female, as shown in figure (2).
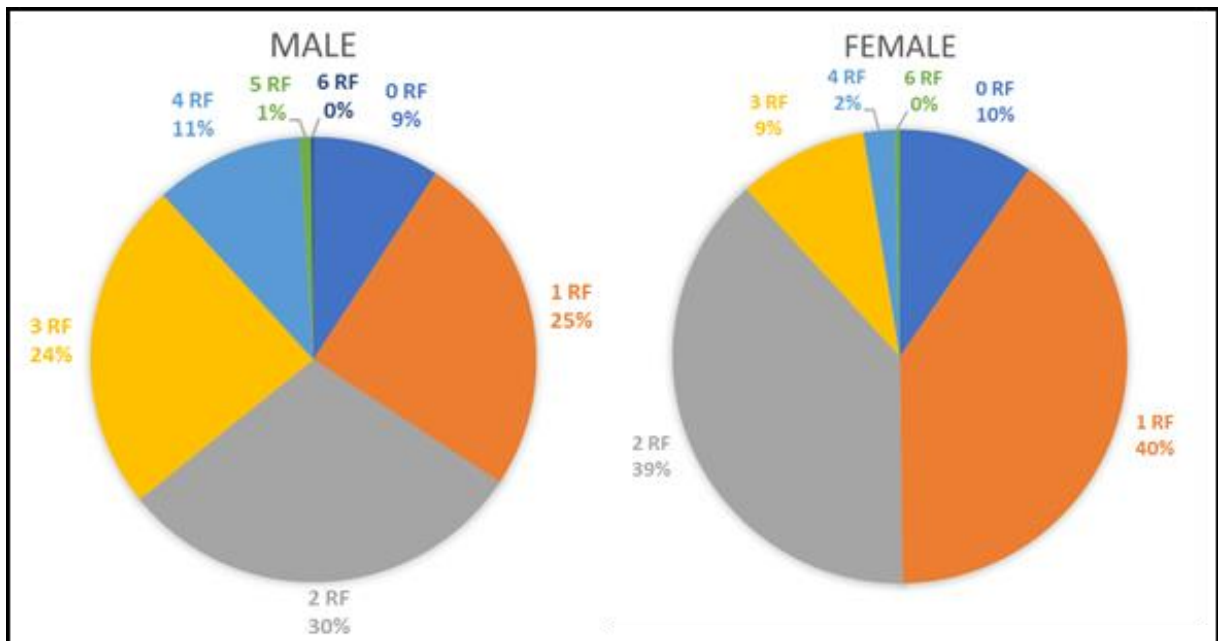
Figure (2), which represent the percentage accumulation of risk factors distribution through both sexes. RF=risk factor.

Discussion

According to the World Health Organization (WHO), noncommunicable diseases, and particularly cancer, cardiovascular disease, and diabetes, are serious public health problems in virtually all of the countries that are located in the Eastern Mediterranean region [16]. In the twenty-first century, the exponential growth of noncommunicable diseases poses a significant threat to world health and prosperity. Tobacco use, poor diet, obesity, and lack of exercise are all substantial risk factors for a wide range of chronic diseases that can be avoided [17].

The current study revealed that the male students were smokers 39.8% comparing to female students as shown in (fig 1). Many of them start smoking in teen age as a study shows that 20% of the smokers

in iraq between age 15-18 years old, therefore, the younger a person starts, the more likely they are to keep smoking [22]. The trend of tobacco smoking epidemic and it is still growing, especially in low- and middle-income countries [23]. WHO works with the governments to implement the tobacco control measures, to reduce the prevalence of use and exposure to tobacco smoke. By applying these measures, governments can reduce the substantial burden of different non communicable disease and death that arose from tobacco smoking [24].

The present study revealed that near to half of the students 48.2% do not practice any type of physical exercise and male students more than female students (57.7% to 42.2% respectively), as shown in (fig 1). Frequent exercise and other forms of physical activity give significant health advantages, including a reduction in the morbidity and death rates associated with a number of chronic diseases in adults, particularly coronary heart disease (CHD) and the risk factors associated with it [25]. There is a correlation, supported by evidence from scientific studies, between engaging in regular physical activity and a reduction in blood lipid levels as well as a reduction in resting blood pressure in individuals who have borderline hypertension, obesity, glucose intolerance, and insulin sensitivity [26].

Moreover, this study demonstrated that male students were more predominant as (71%) and (28.9%) of female students practising abnormal sleep attitude. Sleep time is a vital for the body to recover. During the non-rapid eye movement (NREM) sleep phase, breathing will stabilize heart rate will decrease and blood pressure will reduce. These changes tend to reduce stress on the heart, letting it to recuperate from the tension that happens through waking hours. on the other hand, insufficient sleep hours during night, a person won't have benefit of time spend in the deep stages of NREM sleep that benefit the heart. In other study were 1650 students involved, shows that no significant differences between female and male students in sleep behaviour patterns [27]. In contrast, the study of Yaqoot et al, demonstrated that higher abnormal sleep pattern was in females, among 3,778 students [28].

The present study showed that a (48.2%) has low exercise and sedentary life, of those (57.7%) male student and (42.2%) female student. This finding suggested that high proportion of universities students will develop a CVD. The study of Herbert et al, highlight the significant role physical activity has in promoting the well-being of university students [29]. Furthermore, Engaging in regular exercise is positively linked to improved cardiovascular health of students as the American Heart Association stated and should be combined with regular medical examination [30].

This study showed that prevalence of abnormal weight among universities students were high (44.9%) table (1), from those (77.6%) were male and (22.3%) were female, as shown in (fig 1). This is due to different factors associated like exercise and dieting [31]. While, Solly and colleague suggested to screen students for disordered eating in student populations, including when students present with other mental health conditions [32].

Near to quarter of the total student's population of both sex (23.5%), who involved in this study, had accumulation of 3 and more risk factors and male was more predominant significantly. And more than third of samples size (34.5%) had only 2 risk factors. While remaining student's samples (40.5%) had 2 or less risk factors (fig 3). Because the sample population is of young adult ages (mean 21.59±2.7 SD) beside well-educated persons in university, this is as alarming to students to develop CVD in older age. As many studies show relationship of risk factors and ageing to developing CVD [33].

Conclusion:

Based on the findings of this study, it can be concluded that the prevalence of cardiovascular disease (CVD) risk factors was significant, from those, smoking, efficient sleeping hours, physical exercise and higher abnormal weight recorded in near to half of the students of both genders. Moreover, a relatively high precent of abnormal sleep behavior also stated.

The strength of this study is to asses relative a large population-based sample size of young adult, whom not reported very well in the context of non-communicable disease like CVD. Examining the key cardiovascular risk factors and their interconnections in a young group of university students

offers valuable insights. Our findings reveal that these significant risk factors are not only common but also begin to accumulate at a young age, even among individuals under 25 years old. The rising prevalence of these risk factors suggests a future increase in cardiovascular disease (CVD) cases. This highlights the urgent need for preventive strategies tailored specifically for young people in educational settings.

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