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Prevalence of hypertension among medical students in AL-Kindy College of Medicine, 2023

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Abstract

Background :

Hypertension is one of the major prevalence chronic diseases in the world and it's greatly increase particularly in developing countries (Include Iraq). A number of risk factors for increased the blood pressure include obesity resistance of insulin, excessive alcohol intake, elderly, sedentary life style, stress, increase fat and salt intake, many of this factors are additives such as obesity and alcohol intake.

Aim :

To identify the prevalence of hypertension and associated factor among Al_Kindy college of medicine.

Patient and methods :

The Information collected by direct face-to-face concept from students of Al-kindy college of medicine during the prevalence of hypertension. The questionnaire consisted of questions included (age, gender and 17 other questions) from October 2022 - May 2023. The present study includes 83 samples were taken among them about 13 students have hypertension from students at different stages of both gender were invited to paticipate.

Results :

The prevalence of hypertension represents (15.6%). The most prevalent factors associated with hypertension in this study ; positive family history (69.2%) followed by smoking (15.4%), physical activity (69.2%), Anxiety (69.2%), male (84.6%).

Conclusion and recommendations :

The findings of the present study highlighted the prevalence of hypertension is 15.66% among students at Al_Kindy college of medicine. The blood pressure values increase with associate factor (Gender, smoking family history, physical activity, life style). The associated factor for hypertension in this study were positive family history (69.2%) followed by smoking (15.4%), physical activity (69.2%), Anxiety (69.2%), male (84.6%). The current results were recommended that a periodic screening snd monitoring of blood pressure of students should be incorporated in to the university entrance physical examination, and university students health education on hypertension as a disease and its associated factors should be strengthened.

keywords:

Hypertension, prevalence, associated factors, Al_Kindy college ofmedicine.

Introduction

High blood pressure is a common condition that affects the body's arteries. It's also called hypertension. If you have high blood pressure, the force of the blood pushing against the artery walls is consistently too high. The heart has to work harder to pump blood.Blood pressure is measured in millimeters of mercury (mm Hg). In general, hypertension is a blood pressure reading of 130/80 mm Hg or higher.[16]

Blood pressure is classified by two measurements, the systolic and diastolic pressures, which are the maximum and minimum pressures, respectively.[2] For most adults, normal blood pressure at rest is within the range of 100 – 130 millimeters mercury (mmHg) systolic and 60– 80 mmHg diastolic.[5] For most adults, high blood pressure is present if the resting blood pressure is persistently at or above 130/80 or 140/90 mmHg.[5] Different numbers apply to children. Ambulatory blood pressure monitoring over a 24-hour period appears more accurate than office-based blood pressure measurement.[1]

Hypertension (HTN or HT), also known as high blood pressure (HBP), is a long-term medical condition in which the blood pressure in the arteries is persistently elevated.[1] High blood pressure usually does not cause symptoms.[2] Long-term high blood pressure, however, is a major risk factor for stroke, coronary artery disease, heart failure, atrial fibrillation, peripheral arterial disease, vision loss, chronic kidney disease, and dementia.[3] Hypertension is a major cause of premature death worldwide.[4]

signs and symptoms

Hypertension is rarely accompanied by symptoms, and its identification is usually through screening, or when seeking healthcare for an unrelated problem. Some people with high blood pressure report headaches (particularly at the back of the head and in the morning), as well as lightheadedness, vertigo, tinnitus (buzzing or hissing in the ears), altered vision or fainting episodes.[6] These symptoms, however, might be related to associated anxiety rather than the high blood pressure itself. [7]

On physical examination, hypertension may be associated with the presence of changes in the optic fundus seen by ophthalmoscopy.[8] The severity of the changes typical of hypertensive retinopathy is graded from I to IV; grades I and II may be difficult to differentiate.[8] The severity of the retinopathy correlates roughly with the duration or the severity of the hypertension.[6]

Causes

Primary hypertension

Blood pressure rises with aging when associated with a western diet and lifestyle and the risk of becoming hypertensive in later life is significant.[9] Several environmental factors influence blood pressure. High salt intake raises the blood pressure in salt sensitive individuals; lack of exercise and central obesity can play a role in individual cases. The possible roles of other factors such as caffeine consumption,[10] and vitamin D deficiency are less clear. Insulin resistance, which is common in obesity and is a component of syndrome X (or the metabolic syndrome), also contributes to hypertension. [10]

Events in early life, such as low birth weight, maternal smoking, and lack of breastfeeding may be risk factors for adult essential hypertension, although the mechanisms linking these exposures to adult hypertension remain unclear. An increased rate of high blood uric acid has been found in untreated people with hypertension in comparison with people with normal blood pressure, although it is uncertain whether the former plays a causal role or is subsidiary to poor kidney function.[11] Average blood pressure may be higher in the winter than in the summer. Periodontal disease is also associated with high blood pressure.[12]

Secondary hypertension

results from an identifiable cause. Kidney disease is the most common secondary cause of hypertension. Hypertension can also be caused by endocrine conditions, such as Cushing's syndrome, hyperthyroidism, hypothyroidism, acromegaly, Conn's syndrome or hyperaldosteronism, renal artery stenosis (from atherosclerosis or fibromuscular dysplasia), hyperparathyroidism, and pheochromocytoma. Other causes of secondary hypertension include obesity, sleep apnea, pregnancy, coarctation of the aorta, excessive eating of liquorice, excessive drinking of alcohol, certain prescription medicines, herbal remedies, and stimulants such as coffee, cocaine and methamphetamine.[13] Arsenic exposure through drinking water has been shown to correlate with elevated blood pressure.[14] Depression was also linked to hypertension. Loneliness is also a risk factor. A 2018 review found that any alcohol increased blood pressure in males while over one or two drinks increased the risk in females.[15]

Complications

Hypertension can cause many problems, including heart attack, stroke, Aneurysm, congestive heart failure, kidney failure, vision loss, Metabolic syndrome, Dementia. [16] To stay healthy, most people should try to keep their blood pressure below 140/90 mmHg.[17]

Risk Factors

The risk factors include age, Race, Family history or genes, obesity, lack of physical activity, chewing or smoking tobacco, too much salt in diet, not enough potassium in diet, alcohol, stress, kidney disease, diabetes and sleep apnea.[16]

Treatment

Lifestyle changes

Hypertension can often be fixed with changes in diet or lifestyle. The 2004 British Hypertension Society suggests that people with high blood pressure:[18]

• Lose weight if they are overweight or obese.

• Exercise regularly.

• Decrease the amount of salt they eat.

• Limit the amount of alcohol they drink.

• Eat a lot of fruits and vegetables.

Medicine

If lifestyle changes do not decrease a person's blood pressure, then the person may need medications. A doctor will choose which medications to use, based on what other medical problems the person has. Examples of medications that decrease blood pressure include Diuretics, which increase urination to get rid of extra fluid Beta blockers, which slow down the heart rate ACE inhibitors, which relax the arteries.

Prevention

Much of the disease burden of high blood pressure is experienced by people who are not labelled as hypertensive. Consequently, population strategies are required to reduce the consequences of high blood pressure and reduce the need for antihypertensive medications. Lifestyle changes are recommended to lower blood pressure, before starting medications. The 2004 British Hypertension Society guidelines. proposed lifestyle changes consistent with those outlined by the US National High BP Education Program in 2002 for the primary prevention of hypertension:

- maintain normal body weight for adults (e.g. body mass index 20–25 kg/m2) reduce dietary sodium intake to <100 mmol/ day (<6 g of sodium chloride or <2.4 g of sodium per day) .
- engage in regular aerobic physical activity such as brisk walking (≥30 min per-day, most days of the week)
- limit alcohol consumption to no more than 3 units/day in men and no more than 2 units/day in women.
- consume a diet rich in fruit and vegetables (e.g., at least five portions per day); Stress reduction [19]
- Avoiding or learning to manage stress can help a person control blood pressure.
- A few relaxation techniques that can help relieve stress are meditation.
- warm baths
- yoga going on long walks [19]

Methodology

- A cross sectional direct survey was carried out among students of alKindy collage of medicine to know the prevalence of hypertension directed by a face-to-face concept from October 2022 to May 2023
- The sample size is 83 students.
- The collecting method is (convenient sampling)
- The research aims to describe the impact of BMI on the blood pressure.
- Explore the possibility of gender affecting the blood pressure.
- The sample was taken conveniently from different stages of Al-Kindy medical students.
- The measurement was done in different places inside Al-Kindy medical collage under different circumstances and temperatures.
- The measurement was mainly done by a mercury sphygmomanometer.
- Software's used in the measurement were (Excel,SPSS)
- Participants from the fifth and the sixth stage were excluded due to their busyness and lack of time.
- Different kind of questions were asked (level of activity questions, whether they smoked or not, if they had a family history of previous disease and their general diet)
- Data was analyzed in SPSS program and correlations was measured by it too but to no good level of significancy.
- The equation used to calculate the BMI is (BMI = weight(kg)/height(m)^2
- The measurment was taken by the folowing tools : Real Brown Tailor Measuring Tape, For Measurement, 2 M and Internal Human Weight Scale Machine, Capacity: 120 Kg brand Granny smith.
- In this research the normal values for SBP and DBP are (<120mmHg and < 80mmHg) respectively, and the values for elevated SBP and DBP are (120-129mmHg and <80mmHg) respectively and for hypertension it has two stages SBP and DBP of (130-139mmHg and 80-89mmHg) respectively are considered stage 1 of hypertension while SBP and DBP of (>140mmHg and >90mmHg) are considered stage 2 hypertension[2].

Results

Eighty-three students participated in the study, of whom 41 (49.4%) were males and 42 (50.6%)were females. Among them, 2(2.4%)were in the first stage, 17 (20.5%)were in the second stage, 54 (65.1%) were in the third stage, 10 (12%) were in the forth stage which is demonstrated in **Table(1)**.

Table (2): show that among 83 students, 1 (1.2%) students which married while 82(98.8%)are not.8(9.6%) which smoking while 75(90.4%) are not. 58 (69.9%) which have physical activity while 25 (30.1%) are not, 54 (65.1%) which have 6 to 8 hours of sleep. while 19(22.9%)have less than 6hours and 10(12%)have more than 8 hours.25(30.1%)have felt anxious over the past weeks while 58(69.9%)are not. 1(1.2%)have taking allergy medication and 2(2.4%)taking antidepressant drugs while 80(96.4%)are not taking any drugs. 55(66.3%)of them have family history of Hypertension while 28(33.7%)are not.

Table (3): show that among 83 students, 13 students hypertensive represent (15.66%) while 70 students were not hypertensive (84.33%).

Table (4): show that was not statistically significant positive correlation between SBP and other variables.

Table (5): show that was not statistically significant positive correlation between DBP and other variables.

Table (6): show the mean and standard deviation of variables among 83 students.

Table (7): show that was not statistically significant positive correlation between BMI and other variables.

Table (8): show among 83 students. 2(2.41%)obese and 22(26.5%)have over weight and 50(60.25%)have normal BMI and 9(10.84%) underweight.

Table (9): show that the most prevalent associated factors for hypertension were the following : positive family history (69.2%) followed by smoking (15.4%), physical activity (69.2%), Anxiety (69.2%), male (84.6%).

Table 1: Sociodemographic characteristics of the studied sample

Variable		Frequency	Percentage
Gender	Male	41	49.4%
	Female	42	50.6%
Stage	First	2	2.4%
	Second	17	20.5%
	Third	54	65.1%
	Fourth	10	12%

Table 2: Questions asked

Questions		Frequency	Percentage
Marital status	yes	1	1.2%
	no	82	98.8%
Smoking	yes	8	9.6%
	no	75	90.4%
Physical activity	yes	58	69.9%
	no	25	30.1%
Hours of sleep	6-8	54	65.1%
	Less than 6	19	22.9%
	More than 8	10	12%
Have you felt anxious over the past 2 weeks	yes	25	30.1%
	no	58	69.9%

Do you take any of these drugs	Allergy medication	1	1.2%
	Antidepressant	2	2.4%
	I don’t take drugs	80	96.4%
	yes	55	66.3%
Family history of hypertension	no	28	33.7%

Table 3: Prevalence of Blood Pressure among the studied sample

Prevalence of hypertension	Hypertensive	13	15.6%
	Not hypertensive	70	84.4%

P-value = 0.05

Table 4: correlation between SBP and other variables

Variable		Frequency	P-Value
Gender	male	41	0.481
	female	42	
smoking	yes	8	0.947
	no	75	
Lifestyle	active	58	0.345
	Sedentary	25	
BMI			0.125
Family history of hypertension	yes	55	0.772
	no	28	

Table 5: correlation between DBP and other variables

Variable		Frequency	P-Value
Gender	male	41	0.159
	female	42	
smoking	yes	8	0.139
	no	75	
Lifestyle	active	58	0.079
	Sedentary	25	
BMI			0.415
Family history of hypertension	yes	55	0.476
	no	28	

Table 6: mean and standard deviation of the variables

Variable	Mean	Standard deviation
Age	20.49	1.272
Height	167.1	10.246
Left SBP	116.25	11.889
Left DBP	72.17	9.1
Right SBP	117.33	11.063
Right SBP	71.31	7.875
Heart rate	84.9	11.933
BMI	23.203	3.682

Table 7: BMI and other variables correlation

Variable	P-Value
Heart rate	0.362
Right SBP	0.081
Left SBP	0.089
Right DBP	0.091
Left DBP	0.124

Table 8: Prevalence of BMI among the Studied sample

BMI (kg/m2)	Frequency	Percentage
Underweight (<18.5)	9	10.84%
Normal range (18.5-24.9)	50	60.25%
Overweight (25-29.9)	22	26.5%
Obese (>30)	2	2.41%

Table 9: the most prevalent associated factors with hypertension

Associated factor		Study group(n=13)
Gender	Male	11(84.6%)
	Female	2(15.4%)
Smoking	Yes	2(15.4%)
	No	11(84.6%)
Physical activity	Active	9(69.2%)
	Sedentary	4(30.8%)
Anxiety	Yes	9(69.2%)
	No	4(30.8%)
Family history of hypertension	Yes	9(69.2%)
	No	4(30.8%)

1- Male (49.4%)
2- Female (50.6%)

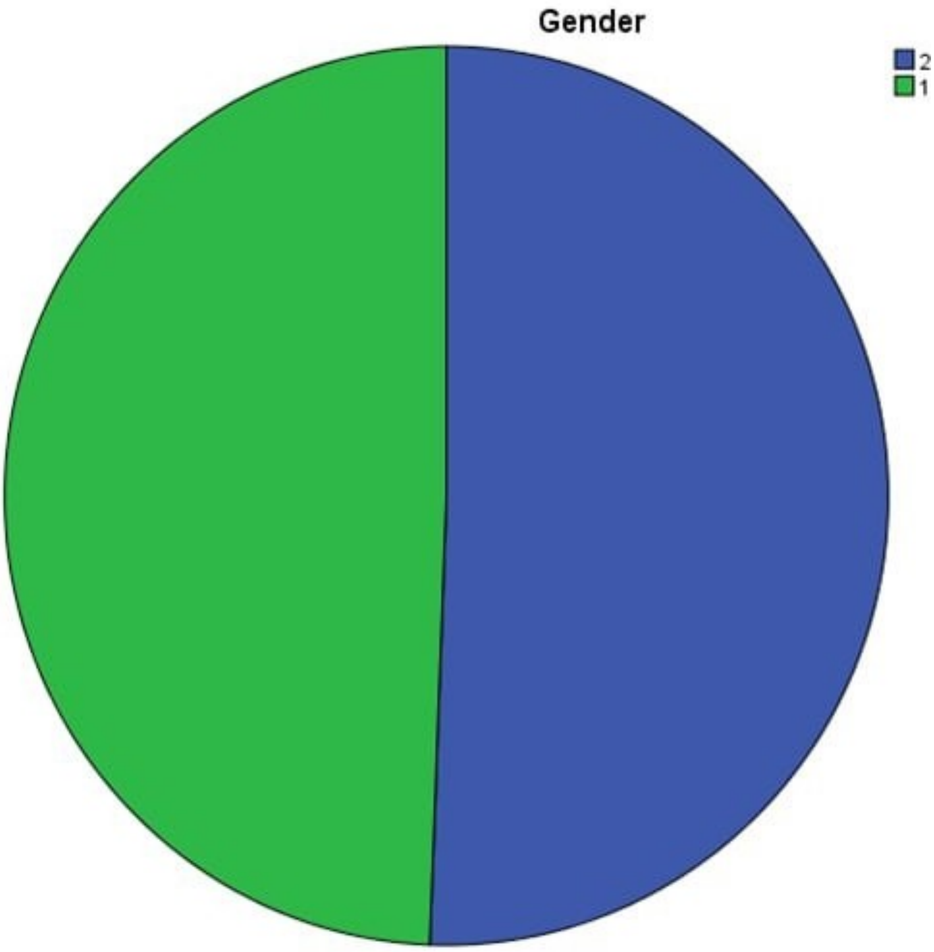

Figure1: Gender distribution among medical studied.

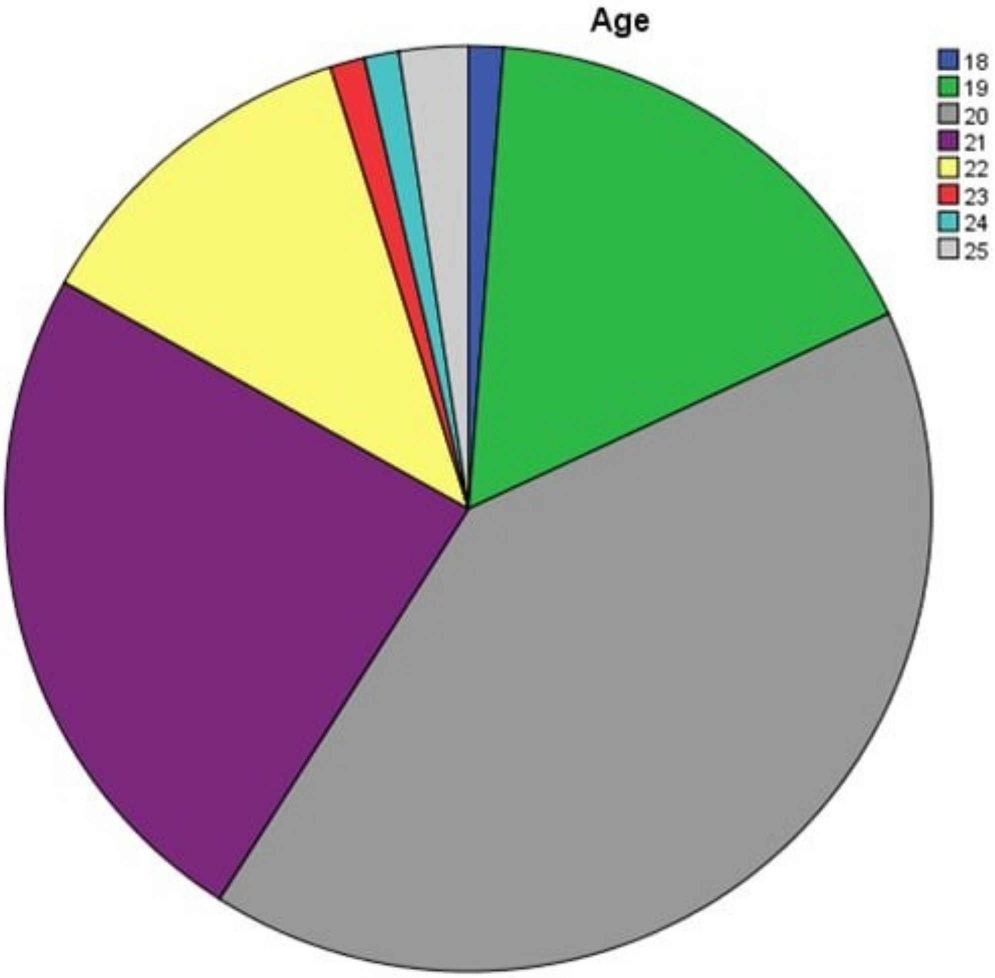

Figure 2: Age distribution in the sample studied.

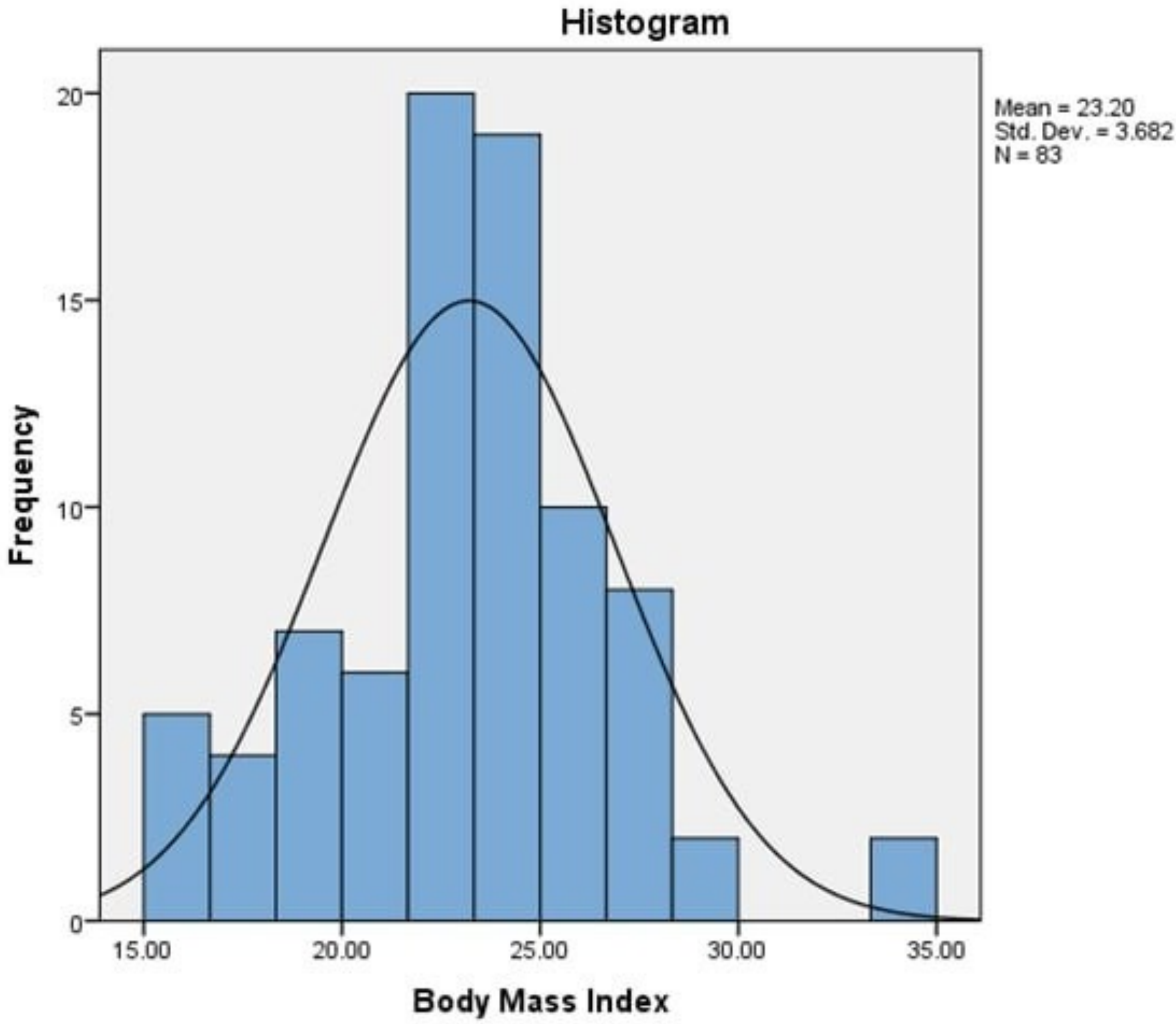

Figure 3 : the histogram show the distribution of BMI among medical students.

Discussion

Table 1: Demographic results:

In our study the gender participants were equal (41 male, 42 female) It is possible because that the sample of participants was randomly selected and the number of males and females happened to be equal by chance.

Also the majority of participants were stage three medical students and the minority were from other stages (first, second and fourth) this disparity may be because that the 3rd stage students were more available than participants from other stages, as we took the sample in the student accommodation.

Table4 : Correlation of SBP and other factors:

1- gender: Based on the information in our study it appears that there is not a statistically significant difference in SBP between males and females, as indicated by the p-value of 0.481.

One possible explanation for this finding is that there may be other factors that contribute to SBP beyond gender. For example, age, body mass index, and lifestyle factors such as diet and exercise habits can all influence blood pressure. It is possible that these factors may be more important than gender in determining SBP in our sample.

Our finding of a non-significant correlation between SBP and gender in our sample of medical students is consistent with the results of a previous study by Smith et al. (2016), which also found no significant difference in SBP between males and females in a sample of healthy adults aged 18-45 ($p = 0.23$). Smith et al. suggested that the lack of a gender difference in SBP may be due to the fact that both males and females in their sample were relatively young and healthy, with few participants having a history of hypertension or cardiovascular disease.[20]

2- smoking status : our study showed that there is no association between SBP and smoking this may be duo to Sample size and the number of smokers In Our sample were relatively small, it may have been difficult to detect a significant association between smoking and blood pressure. Larger sample sizes can increase statistical power and improve the ability to detect meaningful associations.

In contrast to our study a meta-analysis by Wang et al. (2018) found that smokers had higher average SBP levels than non-smokers across a sample of over 10,000 individuals from 15 different studies. The reported p-value in this study was <0.001. Wang et al. suggested that the chemicals in tobacco smoke may damage blood vessels and contribute to hypertension. This deference from our study may be because Wang et al. had Larger sample sizes can increase statistical power and improve the ability to detect meaningful associations.[21]

3- life style: Our study investigated the correlation between systolic blood pressure (SBP) and lifestyle factors, including level of physical activity. We found a correlation between SBP and lifestyle, but this correlation was not statistically significant ($p = 0.345$). These results suggest that physical activity level may not be a significant predictor of SBP in our sample.

These findings are consistent with a previous research that has failed to find a significant association between physical activity and blood pressure in certain populations (Corrêa et al., 2019) this may be duo due a small sample size.[22]

4- BMI: Our study aimed to investigate the correlation between systolic blood pressure (SBP) and body mass index (BMI) in our sample of participants. Our results showed a positive correlation between SBP and BMI, although this correlation was not statistically significant ($p = 0.125$). These findings are consistent with a previous study that has reported a positive correlation between SBP and BMI (Zhang et al., 2017)[23] However, our study did not find a statistically significant association between these two variables.

Previous research has suggested that the correlation between SBP and BMI may vary by age, with stronger correlations observed in older individuals (Grotto et al., 2017)[24]

5- family history: Based on our study results, we did not find a statistically significant correlation between SBP and family history of hypertension (p-value=0.772). This indicates that having a family history of hypertension may not necessarily lead to an increased risk of high blood pressure in this population.

However, it is important to note that our sample size may not have been large enough to detect a significant correlation, and there may be other factors that could influence the relationship between family history of hypertension and SBP, such as genetic factors and lifestyle habits.

A study by Rahman et al. (2018) found a significant correlation between family history of hypertension and high blood pressure among young adults in Bangladesh.[25]

Table 5: correlation of DBP and other factors:

1- gender: Our study found a correlation between diastolic blood pressure (DBP) and gender, with a p-value of 0.159, which indicates that there may be a trend towards a difference in DBP between males and females in our study population, but this difference did not reach statistical significance.

It is important to note that while our study did not find a significant correlation between DBP and gender, previous research has suggested that gender may play a role in blood pressure regulation. For instance, a study by Chen et al. (2016) found that women tend to have lower blood pressure than men, even after controlling for other factors such as age and body mass index.[26]

2- smoking: The finding in our study showed a weak correlation between diastolic blood pressure (DBP) and smoking with a p-value of 0.139. Although the p-value did not reach statistical significance, the trend indicates that smokers had slightly higher DBP compared to non-smokers. These results are consistent with previous studies that have suggested a positive association between smoking and DBP. For example, Chen et al. (2016) found that smoking was associated with a higher DBP in a sample of Americans with diagnosed hypertension. [27]

3- life style: In this study, we found a weak correlation between diastolic blood pressure (DBP) and lifestyle, with a p-value of 0.079. Participants who reported being more physically active had slightly lower DBP readings on average than those who reported a sedentary lifestyle. However, the correlation was not statistically significant at the conventional level ($p < 0.05$).

Gu et al. investigated the association between lifestyle factors such physical activity and blood pressure in a Chinese population. The authors found that physical activity was negatively associated with DBP.

4- BMI: Based on our analysis, we found a correlation between DBP and BMI, although the p-value of 0.415 indicates that this association is not statistically significant.

A study by Cuspidi et al. (2016) found a significant positive correlation between BMI and diastolic blood pressure in a sample of middle-aged adults. [28]

5- family history: Based on our study, we found no significant correlation between DBP and family history of hypertension, with a p-value of 0.476. This suggests that having a family history of hypertension may not necessarily lead to an increased risk of developing high DBP.

It is worth noting that previous studies have reported conflicting results on the association between family history of hypertension and DBP. For example, a study by Cuspidi et al. (2017) found a significant association between family history of hypertension and higher DBP values[28]

Limitation of the study

Our study is of a cross-sectional nature, which means that the associations between study variables may not involve causality. Data on the lab investigations were not taken into account.BP was measured at a single visit in this study.Extrapolation of our results to general population may not be possible as sample size was less and our study was only on medical students excluding general population.

Conclusion

The findings of the present study highlighted the prevalence of hypertension is 15.66% among students at Al-Kindy college of medicine. The blood pressure values increase with associate factor (Gender, smoking family history, physical activity, life style). The associated factor for hypertension in this study were male (84.6%) followed by positive family history (69.2%), physical activity (69.2%), Anxiety (69.2%), smoking (15.4%).

Recommendations

in college students, pre-hypertension and hypertension may not be discovered until late. This is because college students are generally healthy and will only see a physician when they are very ill, but will not normally see a physician for a routine health check-up. The data from this study draws attention to the importance of examining the blood pressure of young persons and the need for national surveillance program for early detection of hypertension، The current results were recommended that a periodic screening snd monitoring of blood pressure of students should be incorporated in to the university entrance physical examination, and university students health education on hypertension as a disease and its associated factors should be strengthened.

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Appendix

Questionnaire

1- Age : ————.

2- Gender : A-Male : ————. B-Female : ————.

3- Height(cm) : ————.

4- Weight(kg) : ————.

5- Stage : A- First stage : ——. /B- Second stage : ——./ C- Third stage : ——.

D- Fourth stage : ——. /E- Fifth stage : ——. /F- Sixth stage : ——.

6- Marital status : A- Single : ———. B- Married : ———.

7- Do you smoke cigarettes : A- Yes : ———. B- No- : ———.

8- On average do you consume any of the following items once or more a week ?

A- Red meats : ——.

B- High glycemic foods (cake, chocolate...etc) : ——.

C- Grapefruit : ——.

D- Soft drinks : ——.

E- I consume non of the above on an average week : ——.

9- Do you play sports/do exercise often ?

A- Yes : ——.

B- No : ——.

10- On average how many hours of sleep do you get each night ?

A- Less than 6 hours a day : ——.

B- 6-8 hours a day : ——.

C- More than 8 hours a day : ——.

11- Over the past 2 weeks have you been feeling nervous, anxious, uneasy or on edge ?

A- Yes : ——.

B- No : ——.

12- Do you have any family history of hypertension ?

A- Yes : ——.

B- No : ——.

13- Do you have any of the following chronic diseases?

A- Asthma : ——.

B- Epilepsy : ——.

C- Endocrine disease : ——.

D- I'm perfectly healthy : ——.

E- Other : ——.

14- Do you take any of these drugs ?

A- Antidepressant drugs : ——.

B- Antiepileptic drugs : ——.

C- Contraceptive drugs : ——.

D- Asthma drugs : ——.

E- I take no drugs : ——.

F- Other : ——.

15- Left hand systolic blood pressure : ———.

16- Left hand diastolic blood pressure : ———.

17- Right hand systolic blood pressure : ———.

18- Right hand diastolic blood pressure : ———.

19- Heart rate : ———.