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Hypertension: Correlation To Other Factors

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Abstract:
Background: *A study involving 105 participants from Duba University, Saudi Arabia, aimed to determine the correlation of hypertension to other factors, including age, marital status, and education, among female students, teachers, and employees.*
Methods: *The study determined the body mass index, and blood pressure and conducted interviews and surveys to identify negligible differences between hypertension and its correlating factors using mean and standard deviation.*
Results: *The study surveyed individuals aged 18-24, with a majority being single and having college/higher education. The majority had a normal weight (55%). They were also overweight (21%), underweight (15%), and obese (9%). The majority had low levels of physical activity (57%), with no activity (43%). The study found that the majority consumed more than three servings of meat/chicken daily, and watched television/cell phone for a significant amount of time. The majority had a low level of physical activity (57%), with no activity (43%).*
Conclusion: *The study found no significant relationship between body mass index and blood pressure, but a negligible relationship between body mass index, physical activity, body mass index, daily TV/cell phone usage, blood pressure levels, and daily spending on television/cell phones and daily serving of meat and spending on TV/cell phones.*
Keywords: *Hypertension, blood pressure, body mass index, physical activity, daily serving of meat, daily spending on television/cell phones.*

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I. Introduction:

The research was conducted in the University of Tabuk Duba branch. The participants who participated in the study were collected randomly such as students, teachers, and other staff inside the university.

Hypertension is a major risk factor for cardiovascular disease and the world's leading cause of morbidity and death, with job strain and HBP being causally linked [1]. BMI, calculated by dividing weight by height, is a cost-effective tool for assessing obesity. Still, its correlation with body fat is moderate, and it doesn't strongly influence metabolic and disease outcomes [14]. Consuming red meat, particularly processed meat, can increase the risk of type 2 diabetes and coronary heart disease, inflammation, metabolic syndrome, blood pressure, and hypertension [15]. Talking on a mobile device for 30 minutes or more per week increases the risk of high blood pressure, a major cause of premature mortality and heart attacks [33]. Low levels of radiofrequency radiation released by mobile phones have been associated with brief increases in blood pressure [16]. According to the Centers for Disease Control and Prevention. Maintaining a healthy blood pressure range by leading a healthy lifestyle. Keeping your blood pressure from rising, commonly known as hypertension, can reduce your risk of stroke and heart disease [17].

II. Review of Related Literature

The primary cause of worldwide morbidity and mortality that emerged was cardiovascular disease, which is a precursor to high blood pressure (1). This increase in blood pressure is directly connected with cardiovascular events later in life, as well as arteriosclerotic alterations, hyperlipidemia, and insulin resistance, all of which contribute to the disease load.[8] Furthermore, a lack of physical activity causes a shift in body mass index (BMI), which could be identified as an additional risk factor for the development of hypertension.[9] Once a behavioral pattern is established, it usually remains throughout life and is difficult to alter (6).

Young adults with prehypertension are prone to develop hypertension in their later life. Hypertension increases the risk of a variety of important health ailments, including cardiovascular disease and stroke, kidney failure, and eye damage. (8). The most effective technique for avoiding problems is early identification of

hypertension (2). Hypertension prevalence in the college-aged population could rise, necessitating early intervention through education, awareness, and lifestyle changes to reduce CVD risk and improve wellness in older age (7).

The rise in hypertension among young adults in the US is primarily due to lifestyle factors like diet and physical activity (1). Despite the danger of having hypertension, young adults are often unaware of their hypertension and are less likely to have it under control (11).

Teaching is a challenging profession that impacts life's mental, organizational, physical, and cognitive aspects. Risk factors include CVD, obesity, hypertension, and other health issues. Environmental conditions in schools can also contribute to generalized health problems like musculoskeletal illnesses and hypertension. (9). Sedentary behavior like screen time with different devices like television and cell phones was also assessed as one of the factors for hypertension (4).

The study recorded participants' blood pressures using automatic monitors and mercury sphygmomanometers, but no additional measurements were conducted due to resource and logistical limitations. Weights and heights were measured using Detecto Stainless Steel 437 for weights, while heights were measured using a height rod and stadiometers and BMI was established according to WHO standards (10). A systematic interview questionnaire was used in this study to collect information regarding dietary lifestyle, stress, exercise, family history, and smoking patterns. In addition, blood pressure and BMI were examined. The results were evaluated with Excel (5).

The text discusses interventions that aim to reduce salt, fat, sugar, and alcohol consumption, increase physical activity, and promote the consumption of vegetables and fruits through public policy, consumer education, community planning, and agricultural and pricing mechanisms. (12). The World Health Organization says enhancing public health includes preventing, caring for, and treating hypertension. Hypertension is typically a chronic condition that necessitates ongoing therapy (13).

III. Materials And Methods Of The Study

The researcher conducted 3 sets of data: 1. determination of body mass index, 2. determination of blood pressure, and 3. interviews/survey questionnaires. For the body index, a weighing scale and measuring tape with metric measurements like feet, inches, and centimeters. Encoding the height in feet and inches, and weight in pounds, and it automatically computed for the body mass index. The body mass index was categorized into underweight, normal weight, overweight, and obesity. In the blood pressure automated Omrom product was used. Blood pressure is classified as normal, prehypertension, stage 1 hypertension, and stage 2 hypertension. The researchers used interviews and survey questionnaires which included nine questions about hypertension. Finally, all data collected will be correlated to hypertension. The study utilized a qualitative and quantitative method of research. Determine the body mass index, and blood pressure and use survey questionnaires to correlate other factors to hypertension.

Tables Of The Study:

Table 1

Distribution in Terms of Age of the Participants

Age	Count	Percent
18-24	84	80%
25-34	4	4%
35-44	9	9%
45-54	8	8%
55-64	0	0%
Total	105	100%

In Age: Those aged 18-24 have 84 participants with 80%. Those aged 25-34 have 4 participants with 4%. Those aged 35-44 have 9 participants with 9%. Those aged 45-54 have 8 participants with 8%.
55-64 have 0 participants with 0%.

Table 2

Distribution in Terms of Marital Status of the Participants

Marital Status	Count	Percent
Single	89	85%
Married	15	14%
Widow	0	0%
Divorce	0	0%
Separate	1	1%
Total	105	100%

In marital status: Single has 89 participants (85%). Married has 15 participants (14%). Widow has 0 participants with (0%). Divorce has 0 participants with (0%). Separate has 1 participant with (1%).

Table 3

Distribution in Terms of Education of the Participants

Education	Count	Percent
Primary school or less	0	0%
Elementary or High School	3	3%
College or Higher Education	102	97%
Total	105	100%

In Education: Primary or less has 0 (0%), elementary or high school 3 (3%), college or higher education has 102 (97%).

Table 4

Distribution in Terms of Body Mass Index of the Participants

Body Mass Index	Count	Percent
Underweight	16	15%
Normal weight	58	55%
Overweight	22	21%
Obese	9	9%
Total	105	100

In Body Mass Index: Those underweight have 16 participants (15%). Normal weight has 58 participants (55%). Overweight: 22 participants with (21%). Obese has 9 participants with (9%).

Table 5

Distribution in Terms of Blood Pressure of the Participants

Blood Pressure	Count	Percent
Normal Blood Pressure	51	49
Prehypertension	32	30
Stage 1	18	17
Stage 2	4	4
Total	105	100

In Blood Pressure: Single has 89 participants (85%). Married has 15 participants (14%). Widow has 0 participants with (0%). Divorce has 0 participants with (0%). Separate has 1 participant with (1%).

Table 6

Distribution in Terms of Daily Serving of Meat/Chicken of the Participants

Daily Serving of Meat/Chicken	Count	Percent
0 - 1	0	0%
1 - 2	7	7%
2 - 3	27	26%
3+	71	68%
Total	105	100%

In Daily Serving of Meat/Chicken: Those 0-1 servings have 0 participants (0%). 1 – 2 servings have 7 participants (7%). 2 – 3 servings have 27 participants (26%). 3+ has 71 participants (68%).

Table 7
Distribution in Terms of Daily hours watching Television/Cell phone of the Participants

Daily hours watching Television, Cell phone	Count	Percent
0-1 hour	33	31%
1-3 hours	30	29%
3-5 hours	36	34%
5+ hours	6	6%
Total	105	100%

In daily hours watching television/cell phone: Those 0-1 hours have 33 participants (31%). 1-3 hours has 30 participants (29%). 3 –5 hours have 36 participants (34%). 5+ has 6 participants (6%).

Table 8
Distribution in Terms of Level of Physical Activity of the Participants

Level of Physical Activity	Count	Percent
No Activity	45	43%
Low	60	57%
Moderate	0	0%
High	0	0%
Total	105	100%

In Level of Physical Activity: Those with No Activity have 45 participants (43%). Low has 60 participants (57%). Moderate has 0 participants (0%). High has 0 participants (0%).

The Level Of Significant Relationship Between Two Variables
Comparative Analysis

Table 9
Mean Value and Standard deviation of Body Mass Index and Blood Pressure

Variables	Mean Value	Standard Deviation	Mean Differences
Body Mass Index	1.769231	0.87279	0.00000
Blood Pressure	1.796931	0.87279	

Body mass index mean value 1.769231, standard deviation 0.87279. Blood pressure mean value 1.796931; standard deviation 0.87279. Mean differences: 0.00000.

Table 10
Mean Value and Standard deviation of Body Mass Index and Level of Physical Activities

Variables	Mean Value	Standard Deviation	Mean Differences
Body Mass Index	1.769231	0.87279	0.197802
Level of Physical Activity	1.571429	0.497245	

Body mass index mean value 1.769231, standard deviation 0.87279. Level of physical activity mean value 1.571429, standard deviation 0.497245. Mean differences: 0.197802.

Table 11
Mean Value and Standard deviation of Body Mass Index and Daily Serving of Meat

Variables	Mean Value	Standard Deviation	Mean Differences
Body Mass Index	1.769231	0.87279	1.921293
Daily Serving of Meat	3.690524	0.612298	

Body mass index mean value 1.769231, standard deviation 0.87279. Daily serving of meat, mean value 3.690524, standard deviation 0.612298. Mean differences: 1.921293.

Table 12

Mean Value and Standard deviation of Body Mass Index and Daily Hours spent on TV/cell phones

Variables	Mean Value	Standard Deviation	Mean Differences
Body Mass Index	1.769231	0.87279	0.316483
Daily Hours Spending TV/cellphones	2.085714	0.910560	

Body mass index mean value 1.769231, standard deviation 0.87279.

Daily Hours Spending TV/cellphones mean value 2.085714, standard deviation 0.910560. Mean differences: 0.316483.

Table 13

Mean Value and Standard deviation of Blood Pressure and Level of Physical Activities

Variables	Mean Value	Standard Deviation	Mean Differences
Blood Pressure	1.769231	0.87279	0.197802
Level of Physical Activities	1.571429	0.497245	

Body mass index mean value 1.769231, standard deviation 0.87279.
Daily Hours Spending TV/cellphones mean value 2.085714, standard deviation 0.910560. Mean differences: 0.316483.

Table 14

Mean Value and Standard deviation of Blood Pressure and Daily Serving of Meat

Variables	Mean Value	Standard Deviation	Mean Differences
Blood Pressure	1.769231	0.87279	1.921293
Daily Serving of Meat	3.690524	0.612298	

Blood pressure mean value 1.769231, standard deviation 0.87279. Daily serving of meat, mean value 3.690524, standard deviation 0.612298. Mean differences: 1.921293.

Table 15

Mean Value and Standard deviation of Blood Pressure and Daily Hour of spending on TV/cell phone

Variables	Mean Value	Standard Deviation	Mean Differences
Blood Pressure	1.769231	0.87279	0.316483
Daily Hour of spending on TV/cell phone	2.085714	0.910560	

Blood pressure mean value 1.769231, standard deviation 0.87279.
Daily hours spent on TV/cell phone, mean value 2.085714, standard deviation 0.910560. Mean differences: 0.316483.

Table 16

Mean Value and Standard deviation of Level of Physical Activity and Daily Serving of Meat

Variables	Mean Value	Standard Deviation	Mean Differences
Level of Physical Activity	1.571429	0.497245	2.119095
Daily Serving of Meat	3.690524	0.612298	

Level of physical activity mean value 1.571429, standard deviation 0.497245. Daily serving of meat, mean value 3.690524, standard deviation 0.612298. Mean differences: 2.119095

Table 17

Mean Value and Standard deviation of Level of Physical Activity and Daily Hour of spending on TV/cell phone

Variables	Mean Value	Standard Deviation	Mean Differences
Level of Physical Activity	1.571429	0.497245	0.514285
Daily Hour of spending on TV/cell phone	2.085714	0.910560	

Level of physical activity mean value 1.571429, standard deviation 0.497245. Daily hour of spending on TV/cell phone mean value 2.085714, standard deviation 0.910560. Mean differences 0.514285.

IV. Results And Discussion:

Based on the results of the statement of the problem the following results were formulated:

Profile Of The Participants

Table 1-3. In the profile of the participants in terms of age, marital status and education:

Most of the participants 84 (80%) are 18-24 years old. Most of the participants are 89 (85%) singles. Most participants are college or higher education 102 (97%). Most participants are from the female branch at the University of Tabuk, Duba branch.

Table 4-8. The majority had a normal weight (55%). They were also overweight (21%), underweight (15%), and obese (9%). The majority had low levels of physical activity (57%), with no activity (43%). The study found that the majority consumed more than three servings of meat/chicken daily, and watched television/cell phone for a significant amount of time. The majority had a low level of physical activity (57%), with no activity (43%).

The Level Of Significant Relationship Between Two Variables

Comparative Analysis

Table 9. In the comparative analysis between the body mass index and blood pressure of the participants:

There is no negligible relationship between the mean value and standard deviation (mean differences 0.00000) between body mass index and blood pressure. Most participants have a normal body mass index and blood pressure. The same findings in the study of Ren, H et al. [18] showed that even in persons with normal body weight, obesity-related metabolic diseases can still occur. The body mass index had a significant weak negative correlation in blood pressure in male participants with no significant correlation found in females. [23].

Table 10. In the comparative analysis between the body mass index and level of physical activity of the participants:

There is a positive negligible relationship between the mean value and standard deviation of (mean differences 1.97802) between body mass index and level of physical activity. Most participants had a normal body mass index, but no activity with 27 (26%), and low activity with 24 (23%). Physical activity and exercise training are important for managing blood pressure, as recognized by professional organizations in their guidelines for hypertension management. Aerobic exercise, dynamic resistance training, and concurrent training have been shown to lower blood pressure and help control hypertension. This review emphasizes the role of exercise training in managing blood pressure for individuals with hypertension and resistant hypertension [22].

Table 11.

In the comparative analysis between the body mass index and daily serving of meat of the participants:

There is a positive negligible relationship between the mean value and standard deviation of (mean differences 1.921293) between body mass index and daily serving of meat. Most participants have a normal body mass index but consumed more than 3 servings of meat.

The evidence linking meat consumption to the risk of hypertension is substantial. High red meat intake could potentially influence the effectiveness of medication treatments for hypertension, especially among hypertensive patients with high-risk [19]. It also emphasizes that diets with less meat and more plant-based foods are typically lower in saturated fat and calories, and richer in fiber, vitamins, and minerals [20]. A study showed that higher consumptions of white meat and poultry are associated with an increased risk of general obesity, whereas, processed meat consumption was associated with central obesity [24].

Table 12. In the comparative analysis between the body mass index and daily hours spending TV/cell phones of the participants:

A positive negligible relationship exists between the mean value (mean differences 0.316483) and standard deviation between body mass index and daily hours of TV/cellphones. Most participants have a normal body mass index but spend more than 5 hours with cell phones.

The amount of time spent watching television and the amount of material watched can contribute to obesity. Watching television promotes physical inactivity, while ads and other programs often urge people to consume more [25].

Table 13.

In the correlation of blood pressure to the level of physical activity of the participants: There is a positive negligible relationship between the mean value (mean differences 1.97802) and standard deviation between blood pressure and level of physical activities.

The amount of time spent in front of the television and the content watched can be a reason for developing obesity. Most participants had no activity with 27 (26%) and low activity with 24 (23%).

Physical activity and fitness training are critical for controlling blood pressure. Their importance as components of a comprehensive lifestyle, intervention is recognized by several professional organizations in their guidelines for arterial hypertension treatment. Aerobic exercise, dynamic resistance training, and concurrent training, which mixes dynamic resistance and aerobic exercise in the same session or on different days, have all been found to reduce blood pressure and improve hypertension control. This review emphasizes the relevance of exercise training in blood pressure management for persons with hypertension and resistant hypertension [22].

Table 14. In the correlation between blood pressure and daily serving of meat of the participants:

There is a negligible positive relationship with the mean difference of 1.921293 between blood pressure and daily serving of meat. Most of the participants consumed more than 3 daily servings of meat and chicken, with 33 (31%) having normal blood pressure, prehypertensive with 21 (20%), and stage 1 blood pressure with 15 (14%).

The evidence linking meat consumption to the risk of hypertension is substantial. High red meat intake could potentially influence the effectiveness of medication treatments for hypertension, especially among hypertensive patients with high-risk [19]. It also emphasizes that diets with less meat and more plant-based foods are typically lower in saturated fat and calories, and richer in fiber, vitamins, and minerals [20].

Table 15. In the correlation between Blood Pressure and Daily Hours of spending on TV/cell phones.

There is a negligible positive relationship with the mean difference of 0.316483 between Blood Pressure and Daily hours of spending on TV/cell phone. Most participants have a normal blood pressure of 51 (49%). Participants with prehypertension have 32 (30%). Participants with stage 1 hypertension have 18 (17%) while stage 2 hypertension have 4 (4%), but spend more than 5 hours with cell phones.

Hypertension (HTN) and high blood pressure have been identified as serious health issues among children and adolescents in recent decades. Both pre-HTN and HTN are on the rise worldwide. In this regard, the results of a recent meta-analysis conducted on more than 54,196 participants showed that the pooled prevalence of hypertension was 5.5% (95% CI: 4.2-6.9), while the prevalence of slightly elevated blood pressure among children and teenagers aged two to 19 was 12.7% (95% CI: 2.1-30.4) [26].

Table 16.

In the correlation between the level of physical activity and daily serving of meat of the participants:

There is a negligible positive relationship with the mean differences of 2.119095 between the level of physical activity and daily serving of meat.

Individuals who eat healthier diets and follow physical activity guidelines have better health outcomes, such as longevity and mental health as well as a lower chance of chronic diseases like type II diabetes, hypertension, and obesity. The International Physical Activity Questionnaire Portuguese Short Version was used to determine the degree of physical activity. [27]. In two large prospective cohorts of US women and men, we discovered that increasing red meat consumption over eight years was directly associated with a higher risk of death over the next eight years, regardless of baseline red meat intake or concomitant lifestyle modifications. A decrease in total red meat consumption and a concurrent rise in the consumption of nuts, fish, chicken without skin, dairy, eggs, whole grains, or vegetables during eight years was associated with a lower risk of death in the next eight years [28].

Table 17.

In the correlation between the level of physical activity and daily Hour of spending on TV/cell phone

There is a negligible positive relationship with the mean differences of 0.514285 between the level of physical activity and daily Hours of spending on TV/cell phone.

Television viewing is a common inactive practice among older persons, the mortality risks linked with hours of daily viewing over many years and whether increasing or reducing viewing time influences death are unknown.

Extended television viewing time was related to higher mortality in older persons and showed, for the first time, that individuals who spent less time watching television had lower mortality. The findings give additional evidence to support behavioral interventions aimed at reducing sedentary television viewing in favor

of more physically active activities, particularly MVPA. Reducing physical inactivity and TV usage among elderly persons could significantly improve public health (29).

V. Conclusions And Recommendations:

Based on the findings of the study, the following conclusions were formulated such as:

Most of the participants are 18-24 years old. Most of them are female. Most of them are single. and have a college with a higher degree of education. Most of the participants have normal blood pressure and normal blood pressure. Most of them consumed more than 3 servings of meat and chicken in daily serving of meat. Most of them spend more than 5 hours in spending time watching TV/cell phones. Most of them have no exercise or no activity.

There is no negligible relationship between body mass index and blood pressure. Body mass index mean value (1.77), standard deviation (0.87). Blood pressure, mean value (1.80), standard deviation of (0.87). Mean differences (0.00). There is a positive negligible relationship between body mass index and level of physical activity. For body mass index, the mean value is 1.77, a standard deviation of 0.87. In the level of physical activities mean value of 1.57, standard deviation of 4.97. The mean difference (0.198). A positive negligible relationship exists between body mass index and daily hours of TV/cell phones. For body mass index, the mean value was 1.77, a standard deviation of 873. In daily hours watching television/cell phone: mean value 2.085, standard deviation of 0.910. The mean difference is 0.316 .

There is a positive negligible relationship between blood pressure and level of physical activity.

For blood pressure, the mean value is 1.769, standard deviation of 0. 873. Low level of physical activity mean value 1.571, standard deviation of 0.497. The mean difference 0.198. There is a negligible positive relationship between blood pressure and daily serving of meat. For blood pressure, the mean value is 1.77, standard deviation of 0. 873.In a daily serving of meat/ chicken: mean value of 3.690, the standard deviation of 0.612. The mean difference 1.921. There is a negligible positive relationship between the correlation between blood pressure levels and the daily spending of television or cell phone usage. For blood pressure, the mean value was 1.769, the standard deviation of 0.872. In daily hours watching television/cell phone: mean value 2.086, standard deviation 0.916. The mean difference is 0.316.

There is a negligible positive relationship between the level of physical activity and daily serving of meat. Level of physical activity mean value 1.571, standard deviation 0.497. In a daily serving of meat/ chicken: mean value 3.690, standard deviation of 0.612. The mean difference, is 2.119. There is a negligible positive relationship between the level of physical activity and daily hours of spending on TV/cell phones. Level of physical activity mean value 1.571, standard deviation 0.497. In daily hours watching television/cell phone: mean value 2.086, standard deviation 0.915. The mean difference 0.514.

The following recommendations are presented:

Regular exercise is one of the most effective lifestyle changes for controlling blood pressure. Limit at least 0-1 serving of meat. White meat like chicken is better than red meat. Eating more vegetables when eating meat is better. Avoid salty food that will also help to prevent hypertension. Even a small reduction of sodium in the diet can improve heart health and reduce high blood pressure.

Managed to use cellphone to watch television for at least two hours and do simple activities to prevent a sedentary lifestyle. Too much screen time and engaging in sedentary activity such as watching TV can be a risk factor for obesity and can lead to a high risk of increased blood pressure. It is advisable to monitor blood pressure and get a regular blood check-up to prevent hypertension.

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