Derna Academy Journal for Applied Sciences

E-ISSN: 3006-3159

DAJAS

Diet and Lifestyle on Blood Pressure Control among Hypertensive patients under care in Tripoli.

Amal R. Agila[1*] and Ambarka Eid. H Kreim[2*]

[1*] Department of Biochemistry, Faculty of Medicine, Derna University, Derna, Libya.
[2*]Department of Nutrition, Faculty of Public Health, Benghazi, Libya.

*Corresponding author: E-mail addresses: amal_agela@yahoo.com.

Volume : 2 **Issue: 1** **Page Number: 21 - 28**

Keywords:
Hypertension, Lifestyle, Tripoli. Blood Pressure, Diet

Received : 11\12\2023
Accepted: 15\01\2024
Published: 25\01\2024

https://doi.org/...../.....vxix.xxxx

ABSTRACT

Hypertension is one of the non-communicable diseases that is the main cause of death. Hypertension is also often called a silent killer because most of the cases do not cause symptoms. Hypertension is closely related to behaviours and lifestyle. Hypertension control is done through behavioral changes, such as adequate physical activity, a healthy diet, and quitting smoking. Aims: In this study, we seek to delve deeper into the issue of blood pressure due to the poor lifestyle that is followed, according to a descriptive and analytical approach. Material and Methods: The data for this study were based on 100 participants between the ages of 18 and 60. This study is descriptive, as a questionnaire was used to answer it. Statistical analysis of the data was performed using SPSS version 26 to evaluate the association of lifestyle with hypertension as well as its association with vital body parameters. Results: 100 cases were divided into 4 groups based on blood pressure levels: normal (N = 16), hypertension stage I (N = 16), hypertension stage II (N = 52), and hypertensive episode (N = 16). 45 (45%) females and 52 (52%) males, while 3 (3%) of subjects did not specify their genders. and it was noted that the percentage of male patients is higher than that of female patients, according to the random samples that were collected. Conclusions: Hypertension, that is, above-normal blood pressure, is the most important, modifiable risk factor for cardiovascular disease and mortality. The incidence is increasing in most countries, and lifestyle factors are considered to play a decisive role in this development. Most cases of hypertension are currently undetected, untreated, or have not reached therapeutic target values for treatment. This leaves much room for improved treatment, both via an increase in non-pharmacological treatment and lifestyle modification along with different pharmacological options.

1. INTRODUCTION

Systemic arterial hypertension is a clinical, multifactorial disease characterised by increased blood pressure. It is generally seen together with structural and functional changes in target organs (heart, brain, and kidneys), and as a result, the risk for cardiovascular events increases [Anh J et al., 2004]. High blood pressure is the biggest contributor to the disease and death burden worldwide, and 9.4 million deaths occur each year (Arena R. & Guazzi M. et al., 2015). The key to preventing deaths is to guide lifestyles towards a healthy path, which is highly dependent on changing risk factors. Hypertension and its complications may start at young ages. (Bowman TS, 2004). Also, lifestyle factors, such as dietary patterns, are implicated as major contributors to the continued high prevalence of hypertension. A big challenge facing medical practitioners and public health authorities is the prevention and management of hypertension

both in individual patients and at a population-wide level, including lifestyle modification, alone or with pharmacological treatment.

Determining and controlling young people's systemic arterial blood pressure is crucial. People can reduce their risk of developing systemic arterial hypertension by changing their lifestyle (Brando AA, et al., 2010). It's common knowledge that leading a healthy lifestyle is the best defence against chronic illnesses in particular. For this reason, maintaining and enhancing health requires living a controlled lifestyle. A healthy lifestyle aims to preserve and enhance one's physical and mental well-being. Above all, it entails managing stress, engaging in social interactions, eating a balanced diet, exercising, leading a regular life, and taking ownership of one's own health (Bruno RM et al., 2016). (A. Baheiraei's 2011 coworkers). There are four primary behavioural risk factors linked to the development of hypertension. Therefore, many of the renal and cardiovascular abnormalities observed in persons with salt-sensitive hypertension may also be caused by the intrinsic impact of sodium on microvascular vasomotor. The DASH experiment found that reducing salt intake resulted in a linear drop in both normotension and hypertension participants' systolic and diastolic blood pressure. A strong positive connection has been demonstrated in recent prospective large cohort research between blood pressure and urine sodium excretion, a measure of dietary sodium. However, compared to research participants who did not have hypertension, those who excreted more than 5 grammes of sodium daily showed a stronger link with this outcome (Liu X & Byrd). (Liu X & Byrd JB, 17). Then, according to scientific studies, reducing dietary salt to fewer than 3.4 g/day is reasonable and justified for people with hypertension, heart disease, and/or renal failure. Instead, there is no evidence that reducing salt intake in the general population or those with normotension is advantageous. A more prospective study is required to clarify this. It is commonly known that smoking cigarettes contains compounds that are extremely dangerous to the heart and blood vessels, primarily nicotine and carbon monoxide. Functional and structural alterations are commonly observed as a result of carbon monoxide and nicotine activity (Lim SS & Vos T., 2010). Multiple studies have indicated that being exposed to both active and passive cigarette smoke can hurt vasodilator function in both humans and animals. In microvascular beds, cigarette smoke exposure can reduce endothelium-dependent vasodilatation. Nitric oxide (NO) is a vital component of the endothelium's vasodilator action, and exposure to smoke can reduce NO availability by altering the expression and activity of the endothelium NO synthase enzyme. Additionally, nicotine and its isomers can cause the release of catecholamines and sympathetic stimulation (Mahmud A. and Feely J., 2003). When the sympathetic nervous system is stimulated, it causes a temporary increase in both heart rate and systolic blood pressure. These effects occur repeatedly. Smoking affects vascular resistance in two ways: by increasing catecholamine-dependent vasoconstriction and impairing endothelium-dependent vasodilatation. Additionally, smoking may increase platelet aggregation and adhesiveness, leading to changes in blood rheology and an increased risk of thrombosis. There is a lack of clarity and conflicting results in studies investigating the relationship between smoking and hypertension. Several studies have been conducted to compare the blood pressure values of non-smokers and smokers. These studies have revealed that smokers tend to develop hypertension and have higher blood pressure levels, indicating the negative impact of smoking on the body. However, recent reports suggest that reducing or quitting smoking can significantly improve diastolic and systolic blood pressure values in individuals. On the other hand, some research shows that smoking itself does not directly cause hypertension or high blood pressure. Observational analyses suggest a correlation between current smoking and lower blood pressure levels, as well as a lower prevalence of hypertension. There is no evidence to suggest that smoking causes high blood pressure, (R. et al. in 2016). On the other hand, exercise training has been observed to provide various positive effects on the body's hemodynamics and metabolism, thus reducing the overall risk of cardiometabolic diseases. It does this by reducing sympathetic responses and impacting the hypothalamic-pituitary-adrenal axis, which results in lower cortisol levels, reduced cardiovascular reactivity, and faster cardiovascular recovery in response to stress. Furthermore, exercise helps to increase pro-antigenic factors, leading to an increase in the number of muscle fiber capillaries Regular physical activity has been found to have a positive effect on our blood vessels by reducing arterial stiffness and balancing the vasoconstrictor and vasodilator systems. However, determining the exact impact of physical activity on blood pressure can be challenging due to various factors such as age, duration and amount of exercise, muscles used, and any pre-existing health conditions. Though several studies have shown that exercise can significantly lower blood pressure, the results can vary based on the methodology used and the sample characteristics, such as whether the participants had hypertension or normotension. Abuse of alcohol is known to have detrimental effects on blood pressure, the liver, heart, pancreas, and other organ systems. Alcohol consumption has complex, nonlinear acute effects on blood pressure that can be either hypotensive or antihypertensive depending on how long it has been since consumption. Blood pressure has long been linked to excessive alcohol consumption (Rimmele U. et al., 2009). There has been evidence of a linear correlation between blood pressure readings, alcohol use, and the prevalence of hypertension in the general population. Regardless of the type of drink, Matavelli LC (2007) demonstrated that alcohol-induced hypertension is more prominent in Black men and is specifically connected with systolic values. A prospective study discovered a positive and substantial correlation with hypertension in men and a J-shaped correlation with hypertension in women. The scientists came to the conclusion that men are more likely to develop high blood pressure and women are less likely to do so when they drink light to moderate amounts of alcohol. Briasoulis et al. recently published a meta-analysis with similar findings; the undesired.

2. METHOD

Study Subjects

The data from this study are based on 100 participants between the ages of 18 and 60. This study is descriptive, as a questionnaire was used to answer it, which was conducted from March to July 2023. The location of the study was in the city of Tripoli - Libya.

Sample Size

Data were collected for 100 participants in the study who had high blood pressure, where measurements of blood pressure levels, lipid profile (cholesterol, triglycerides, high- density lipids, low-density lipids) and fasting glucose levels were collected. This is to reveal the effect of blood pressure on the important vital parameters of the body. And answering some questions related to lifestyle to know its effect on the patient with high blood pressure.

Data Analysis

A STATISTICAL ANALYSIS OF THE DATA WAS CARRIED OUT USING THE SPSS PROGRAM VERSION 26 TO ASSESS THE ASSOCIATIONS OF LIFESTYLE WITH HIGH BLOOD PRESSURE, AS WELL AS ITS ASSOCIATION WITH VITAL PARAMETERS OF THE BODY

3. RESULT

100 cases were divided into 4 groups based on blood pressure levels: Normal (N=16), Hypertension Stage I (N=16), Hypertension Stage II (N=52), and Hypertensive Episode (N=16) (Table 1).

Table 1. Demographic distribution and basic data of study participants.

Variable	Normal (N=16)	Hypertension Stage I (N=16)	Hypertension Stage II (N=52)	Hypertensive Episode (N=16)	Total
Gender					
Male	9	8	27	7	**51**
Female	6	8	24	7	**45**
Age					
18 – 30 Years	1	0	6	0	**7**
30 – 45 Years	5	8	17	4	**34**
45 – 60 Years	8	8	28	11	**55**

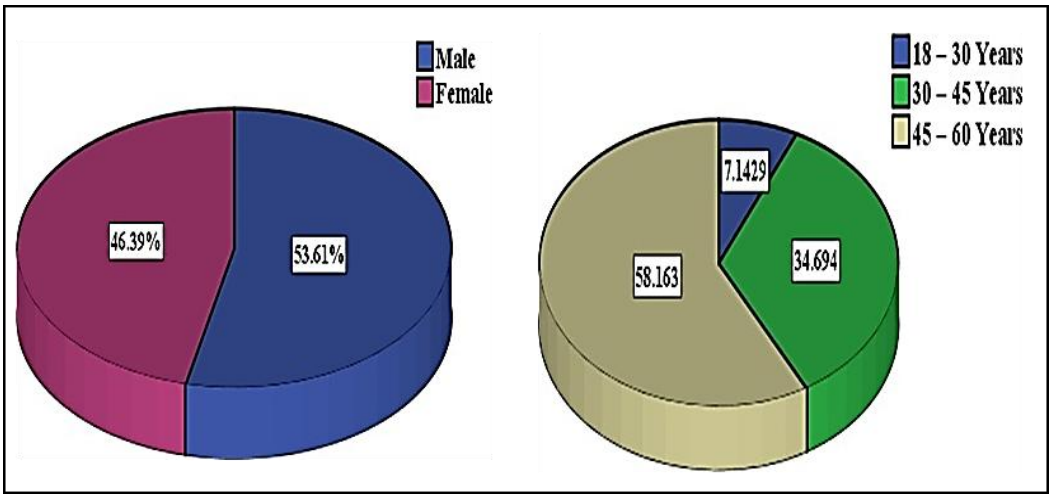

Fig 1. Distribution of the genders and Age of the study sample

100 volunteers were enrolled 45 (45%) females and 52 (52%) males while 3 (3%) of subjects did not specify their genders. According to Table 1, which compares volunteers by age ranging from (18 to 60 years), the age group that was between (50-69) is the group most affected by high blood pressure and has the highest prevalence rate, and it was noted that the percentage of male patients is more than female, according to the random samples that were collected.

Table 2. Shows the medical health status of study participants

Variable	Normal (N=16)	Hypertension Stage I (N=16)	Hypertension Stage II (N=52)	Hypertensive Episode (N=16)	Total
BMI					
Thinness ≤ 18.5	0	0	1	0	**1**
Normal Weight 18.6 – 24.5	8	6	21	2	**37**
Overweight 25 – 29.9	4	4	17	1	**26**
Excessive obesity ≥ 30	4	5	13	11	**33**
Causes of hypertension					
Hereditary	13	11	30	8	**62**
Bad eating habits	2	5	19	4	**30**
Duration of hypertension					
1 – 3 Years	5	13	29	6	**53**
3 – 5 Years	2	0	5	2	**9**
5 - 10 Years	4	3	7	2	**16**
More than 10 Years	1	0	3	3	**7**

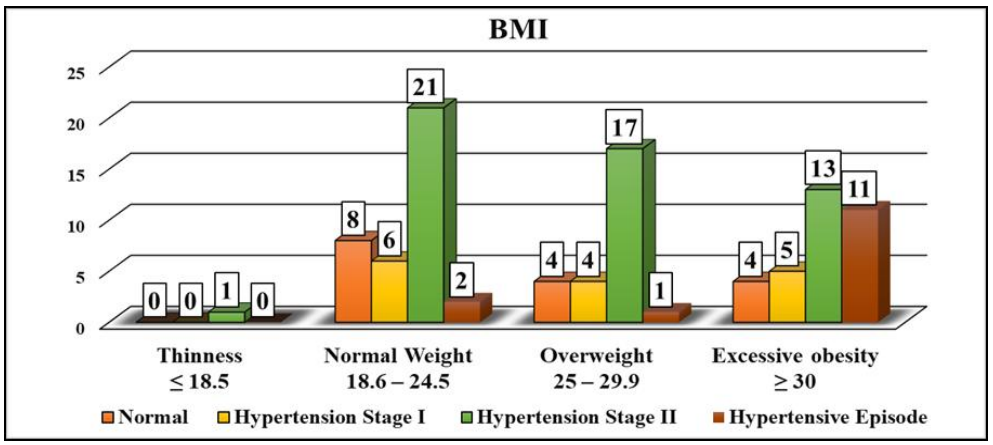

Fig 2. Distribution of BMI of the study sample

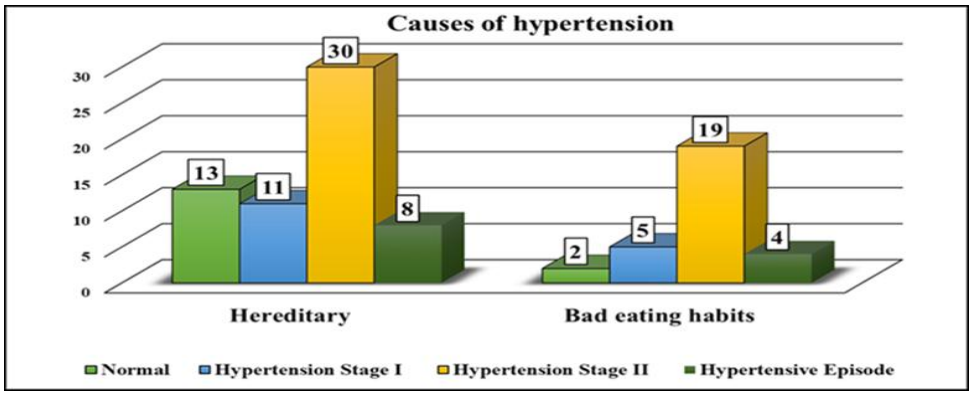

Fig 3. Distribution of Causes of hypertension of the study sample

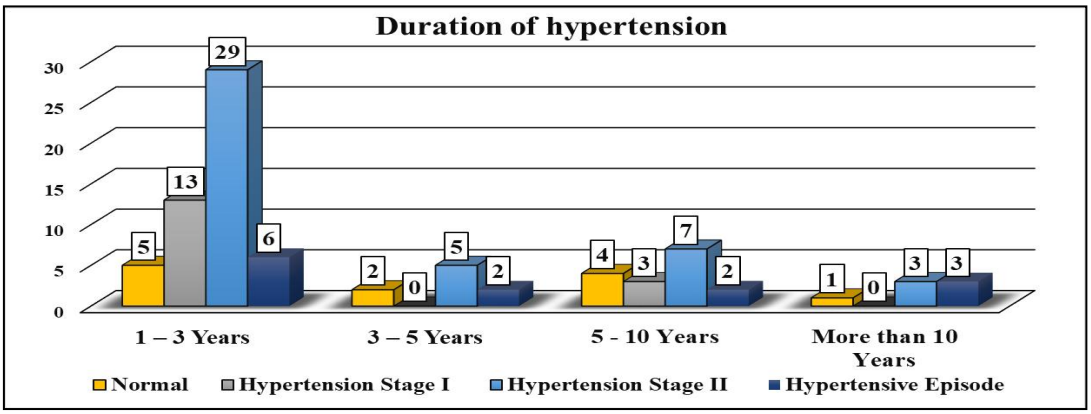

Fig 4. Distribution of Duration of hypertension of the study sample

Table 3. Shows the life style status of study participants

.

Variable	Normal (N=16)	Hypertensio nStage I (N=16)	Hypertension Stage II (N=52)	Hypertensive Episode (N=16)	Total
Do you smoke?					
Yes	7	4	20	7	38
No	9	12	32	8	61
Smoke type?					
Cigarette	3	2	2	0	7
Chew	3	0	9	4	16
Argyle	2	2	10	3	17
Do you do physical activities?					
Yes	1	3	13	3	20
No	14	13	36	12	75
Always	0	0	2	0	2

Fig 5. Distribution of life style of the study sample

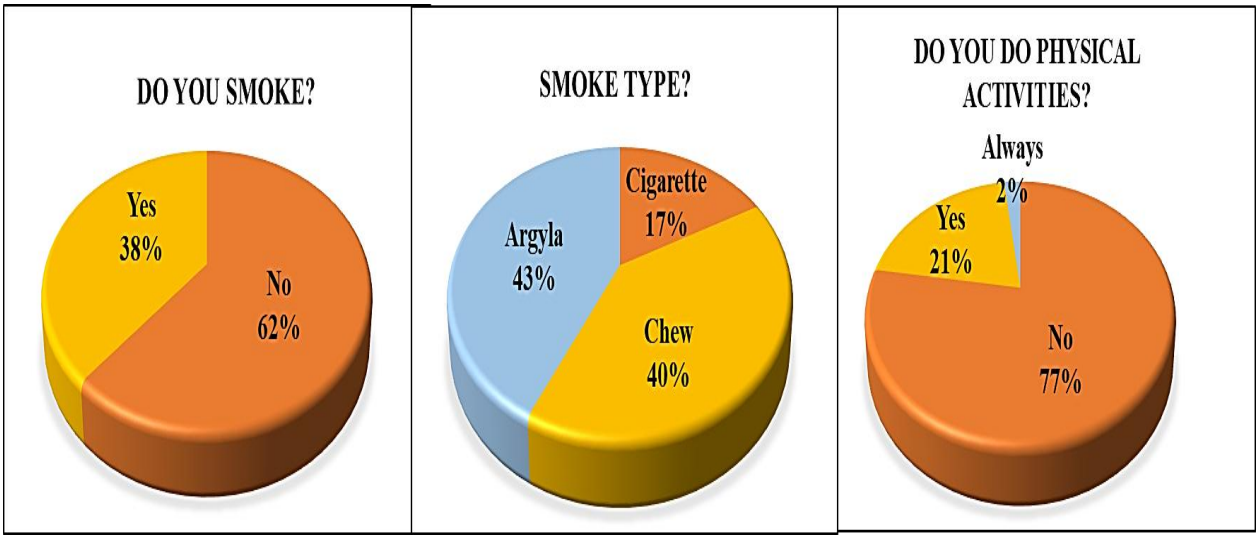

Table 4. Shows the nutritional information of study participants.

Variable	Normal (N=16)	Hypertension Stage I (N=16)	Hypertension Stage II (N=52)	Hypertensive Episode (N=16)
The number of times you eat sweets And drink soft drinks				
I don't eat or drink at all	2	5	3	0
1 - 2 servings per day	12	5	39	9
3 - 5 servings per day	1	3	6	6
5 - 7 servings per day	1	3	4	0
The number of times you eat meat, fish and chicken				
I don't eat or drink at all	1	0	0	1
1 - 2 servings per day	6	7	25	5
3 - 5 servings per day	5	6	14	7
5 - 7 servings per day	4	3	13	2
The number of times you eat fruits and vegetables				
I don't eat or drink at all	1	2	13	0
1 - 2 servings per day	12	9	26	9
3 - 5 servings per day	2	2	8	6
5 - 7 servings per day	1	2	4	0
The number of times you eat salty foods and pickles				
I don't eat or drink at all	1	5	4	1
1 - 2 servings per day	10	7	12	1
3 - 5 servings per day	1	3	20	7
5 - 7 servings per day	4	1	15	6
The number of times you drink milk and dairy products				
I don't eat or drink at all	4	2	9	1
1 - 2 servings per day	2	5	16	5
3 - 5 servings per day	4	3	12	7
5 - 7 servings per day	6	6	15	2

The number of times youdrink tea and coffee				
I don't eat or drink at all	2	3	3	6
1 - 2 servings per day	2	5	12	9
3 - 5 servings per day	4	3	13	0
5 - 7 servings per day	8	5	24	0
The number of times youdrink water				
1 - 2 servings per day	9	6	34	6
3 - 5 servings per day	6	6	13	4
5 - 7 servings per day	1	4	5	5

4. DISCUSSION

The findings showed that 51% of males and 45% of females suffer from high blood pressure, 38% are smokers, 75% are inactive, 26% are overweight, and 33% are obese, and all these factors pose risks. To health. The study by Tringle M. et al. showed that a focus on creating healthy lifestyles for clinicians who specifically control cardiovascular risk factors can benefit the general population. In other words, clinicians with poor physical and mental health can have a direct impact on patients' health care and safety (Tringler M. et al., 2012). Our data showed that about 59% of the participants were overweight or obese, which was not similar to the study conducted by Santos and Cichiri. The results of these studies showed that overweight and obesity are common problems in Ardabil society, as mentioned earlier.

Other studies show that higher BMI and smoking are associated with higher blood pressure as well.

The data also found that, in general, about 37% of our samples had a normal BMI regardless of their gender, which is similar to findings from previous studies. Frequent food consumption of high carbohydrate (i.e., breads, rice, pasta, pancakes, biscuits, liquid fats, and red meat) and high energy (e.g., cream, butter, nuts, and sausage) weekly in overweight subjects was significantly higher than in normal weight subjects, and these results are consistent with similar studies among adults. We found that the increased frequency of weekly coffee intake in hypertensive subjects was significantly higher than in non-hypertensive subjects. Similar to our finding, some studies have found a relationship between coffee intake and BP, whereas other investigations showed no positive or negative associations between hypertension and coffee drinking (Bruno RM, et al., 2016).

5-CONCLUSION

Hypertension, that is, above-normal blood pressure, is the most important, modifiable risk factor for cardiovascular disease and mortality. The incidence is increasing in most countries, and lifestyle factors are considered to play a decisive role in this development. Obesity, physical inactivity, unhealthy diets, increased salt intake, smoking, and psychosocial stress, in particular, have varying degrees of significance.

6. REFERENCES

Anh J, Varagic J, Slama M, Susic D, Frohlich ED (2004) Cardiac structural and functional responses to salt loading in SHR. Am J Physiol Heart Circ Physiol 284: 767- 772.

Arena R, Guazzi M, Lianov L, Whitsel L, Berra K, Lavie CJ, Kaminsky L, Williams M, Hivert MF, Cherie Franklin N, Myers J. Healthy lifestyle interventions to combat noncommunicable disease—a novel nonhierarchical connectivity model for key stakeholders:a policy statement from the American Heart Association, European Society of Cardiology, European Association for Cardiovascular Prevention and Rehabilitation, and American College of Preventive Medicine. *European heart journal.* 2015;36(31):2097 109.

Barua RS, Ambrose JA, Srivastava S, DeVoe MC, Eales- Reynolds LJ (2003) Reactive oxygen species are involved in smoking-induced dysfunction of nitric oxide biosynthesis and upregulation of endothelial nitric oxide synthase:An in vitro demonstration in human coronary artery endothelial cells. Circulation 107: 2342-2347.

Bowman TS, Gaziano JM, Buring JE, Sesso HD (2007) A prospective study of cigarette smoking and risk of incident hypertension in women. J Am Coll Cardiol 50: 2085-2092.

Brandão AA, et al. VI Diretrizes Brasileiras de Hipertensão:[errata] Arq Bras Cardiol. 2010;95(4):553–553.

Bruno RM, et al. Association between lifestyle and systemic arterial hypertension in young adults:a national, survey-based, cross-sectional study. *High Blood Pressure & Cardiovascular Prevention.* 2016;23(1):31–40.

Baheiraei A, et al. Health-promoting behaviors and social support of women of reproductive age, and strategies for advancing their health:Protocol for a mixed methods study. *BMC public health.* 2011;11(1):191.

Chue, C. D., Townend, J. N., Steeds, R. P., & Ferro, C. J. (2010). Republished paper: arterial stiffness in chronic kidney disease: causes and consequences. *Postgraduate medical journal*, *86*(1019), 560-566.
Gumus A, Kayhan S, Cinarka H, Sahin U (2013) The effect of cigarette smoking on blood pressure and hypertension.ABC Med 1: 8-15.

Hioki Y, Aoki K, Kawano K, Homori M, Hasumura Y, et al. (2001) Acute effects of cigarette smoking on platelet-dependent thrombin generation. Eur Heart J 22: 56-61.

Ijzerman RG, Serne EH, van Weissenbruch MM, de Jongh RT, Stehouwer CD (2003) Cigarette smoking is associated with an acute impairment of microvascular function in humans. Clin Sci (Lond) 104: 247-252.Leone A, Landini L, Biadi O, Balbarini A (2008) Smoking and cardiovascular system: Cellular features of the damage. Curr Pharm Des 14: 1771-1777.
Ivy, J. R., & Bailey, M. A. (2014). Pressure natriuresis and the renal control of arterial blood pressure. The Journal of physiology, 592(18), 3955-3967.

Leone A, Landini L, Biadi O, Balbarini A (2008) Smoking and cardiovascular system: Cellular features of the damage. Curr Pharm Des 14: 1771-1777.

Linneberg A, Jacobsen RK, Skaaby T, Taylor AE, Fluharty ME, et al. (2015) Effect of smoking on blood pressure and resting heart rate: A mendelian randomisation meta- analysis in the CARTA consortium. Circ Cardiovasc Genet 8:832-841.

Li G, Wang H, Wang K, Wang W, Dong F, et al. (2017) The association between smoking and blood pressure in men: A cross-sectional study. BMC Public Health 17: 797.

Liu X and Byrd JB (2017) Cigarette smoking and subtypes of uncontrolled blood pressure among diagnosed hypertensive patients: Paradoxical associations and implications. Am J Hypertens 30: 602-609.

Lim SS, Vos T, Flaxman AD, Danaei G, Shibuya K, Adair-Rohani H, AlMazroa MA, Amann M, Anderson HR, Andrews KG, Aryee M. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990–2010:a systematic analysis for the Global Burden of Disease Study 2010. The lancet. 2012;380(9859):2224–60.

Mizobe F, Livett BG (1983) Nicotine stimulates secretion of both catecholamines and acetylcholinesterase from cultured adrenal chromaffin cells. J Neurosci 3: 871-876.

Mahmud A, Feely J (2003) Effects of passive smoking on blood pressure and aortic pressure waveform in healthy young adults-influence of gender. Br J Clin Pharmacol 57: 37-43.

Matavelli LC, Zhou X, Varagic J, Susic D, Frohlich ED (2007) Salt-loading produces severe renal hemodynamic dysfunction independent of arterial pressure in spontaneously hypertensive rats. Am J Physiol Heart Circ Physiol292: 814-819.

Polosa R, Morjaria JB, Caponnetto P, Battaglia E, Russo C,et al. (2016) Blood pressure control in smokers with arterial hypertension who switched to electronic cigarettes. Int J Environ Res Public Health 13.

Rimmele U, Seiler R, Marti B, Wirtz PH, Ehlert U, et al. (2009) The level of physical activity affects adrenal and cardiovascular reactivity to psychosocial stress. Psychoneuroendocrinology 34: 190-198.

Tringler M, et al. High Blood Pressure, Overweight and Obesity Among Rural Scholars from the Vela Project. High Blood Pressure & Cardiovascular Prevention. 2012;19(1):41–46.

23.Whitehead D. Health promotion and health education:advancing the concepts. Journal of advanced nursing. 2004;47(3):311–320.

World Health Organization. *Global Status Report on Non-Communicable Diseases*. Geneva: World Health Organization; 2013.

Yarljoglues M, Kaya MG, Ardic I, Calapkorur B, Dogdu O, et al. (2010) Acute effects ofpassive smoking on blood pressure and heart rate in healthy females. Blood Press Monit 15: 251-256.

Yarljoglues M, Kaya MG, Ardic I, Calapkorur B, Dogdu O, et al. (2010) Acute effects ofpassive smoking on blood pressure and heart rate in healthy females. Blood Press Monit 15: 251-256.