

Sudanese Knowledge of Life Styles in Relation to Hypertension and their Attitude to Measure their Blood Pressure

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Abstract: Introduction: Lifestyle modification is a long - term community - based policies and procedures for prevention and control of non - communicable diseases (NCDs). Hypertension (BP) is one of the NCDs, that may lead to other NCDs such as cardiovascular diseases, stroke, diabetes mellitus and renal failure. Objectives: To assess knowledge of life styles Sudanese participants as risk factors for developing BP or preventive measures from hypertension. Methods: A cross - sectional study was designed. The assessment tool was questionnaire, which included sociodemographic data, the knowledge & attitude of life style & hypertension such as dietary factors, stress, smoking and physical activities. Results: Total subjects was 450 participants, 48.7% were males and 51.3% were females. Data illustrated that, 30.2% think that hypertension is a chronic - NCD and 26.4% replied as hypertension a silent killer. 62.4% and 61.3% of the participants consider high salt and high fat intake respectively were risk factors to develop hypertension. Almost third thinks that, taking vegetables is a preventive measure and 27.8% think that taking fruits was preventive measure to develop hypertension. The results showed that, 76.4%, 53.1%, and 53.4% of the subject think that stress, smoking and diabetes mellitus respectively were risk factors to develop hypertension, where as 60.8% think that, physical exercise is preventive measure against hypertension. 79% check their blood pressure either by medical staff or during health awareness activities. Conclusion: The knowledge of the relationship between hypertension risk factors with eating salty food and fatty food were good, whereas eating vegetables and fruits as preventive life style were very low. Those who used to check their blood pressure routinely was less than recommended.

Keywords: NCD, Hypertension, life style, Knowledge, Attitude Sudan

1. Introduction

Lifestyle improvement associated with the reduction of cardiovascular diseases (CVD) events extend to hypertensive patients and normotensive individuals. Adherence to a healthy lifestyle pattern is associated with a lower risk of cardiovascular diseases among hypertensive patients (Su et al., 2023). The number of people with hypertension worldwide aged 30–79 years increased dramatically from 331 million women and 317 million men in 1990 to 626 million women and 652 million men in 2019, respectively (Risk Factor Collaboration., 2021). According to the World Health Organization (WHO), non - communicable diseases (NCD) are chronic diseases which tend to have long duration such as cardiovascular disease, diabetes mellitus, hypertension and chronic lung diseases. NCD are of increasing concern globally due to their high mortality rate and responsible for about 41 million death each year, equivalent to 71% of all deaths globally in low - and middle - income countries (WHO., 2019).

There are several pathophysiologic mechanisms which link both hypertension and coronary heart diseases. Hypertension induces endothelial dysfunction, may lead to atherosclerotic plaque. Left ventricular hypertrophy and myocardial ischemia are usual complications of hypertension (Ting et al., 2023). Diabetes mellitus is one of the risk factors for cardiovascular disease especially hypertension (Pan et al., 2023). Non - communicable diseases (NCDs) are of increasing concern for society and national governments, as

well as globally due to their high mortality rate (Budreviciute et al., 2020, Su et al., 2023).

Being close to the Mediterranean diet throughout life - course and being physically active were protective against developing CVD, while continuous smoking was detrimental against CVD risk (Damigou et al., 2023). Eating high calorie food with low physical exercise may lead to obesity. Abdominal obesity may be defined as excess deposits of fat in the abdominal region. It is independent of body mass index and measured by raised waist circumference for men ≥ 90 cm and women ≥ 80 cm. It is positively related to NCDs (Dhawan and Sharma., 2020). Prospective American cohort study, participants were the Nurses' Health Study and the Health Professionals Follow - Up Study, reported that, adherence to a healthy lifestyle at mid - life is associated with a longer life expectancy free of major chronic diseases (Yanping et al., 2020, Damigou et al., 2023).

Th rationale and the aims of the study:

There was no published scientific paper illustrated the Sudanese knowledge of life styles such as healthy diet, physical activities, stress and smoking as risk factor for development of hypertension or as preventive life style from acquiring hypertension. The aim of this study is to study the knowledge of life styles Sudanese participants either as risk factors for developing BP or preventive life style from hypertension.

2. Material and Methods

This is a cross - sectional study. The assessment tool was questionnaire, which included sociodemographic data, the knowledge of life style & hypertension such as taking high salt of fat, stress, obesity, diabetes, stress and smoking as risk factors for development of hypertension. Whereas practicing physical activities, eating vegetables and fruits as prevent measurements against hypertension. The attitude of measuring their blood pressure was also studied. Excluding criteria age less than 15 years and medical staff.

Statistical analyses: Statistical Package for Social Sciences (SPSS) was used to analyze the data. The results expressed as frequency, percentile and chi - square were used to demonstrate the differences between sex and age groups.

3. Results

Those accepted to participate were 95% of subjects asked to participate in this study. Almost half of them were males and almost half of them were females (table 1).

Table 1: Sociodemographic data of the participants

Age	No	%
<18	86	19.6
18 - 40	209	47.6
41 - 60	102	23.2
>61	42	9.6
Total	439	100
Sex		
Male	213	48.7
Female	224	51.3
Occupation		
Students	173	39.4
Employees	118	27.0
Housewives	60	13.7
Retired	50	11.4
Unemployed	36	8.2

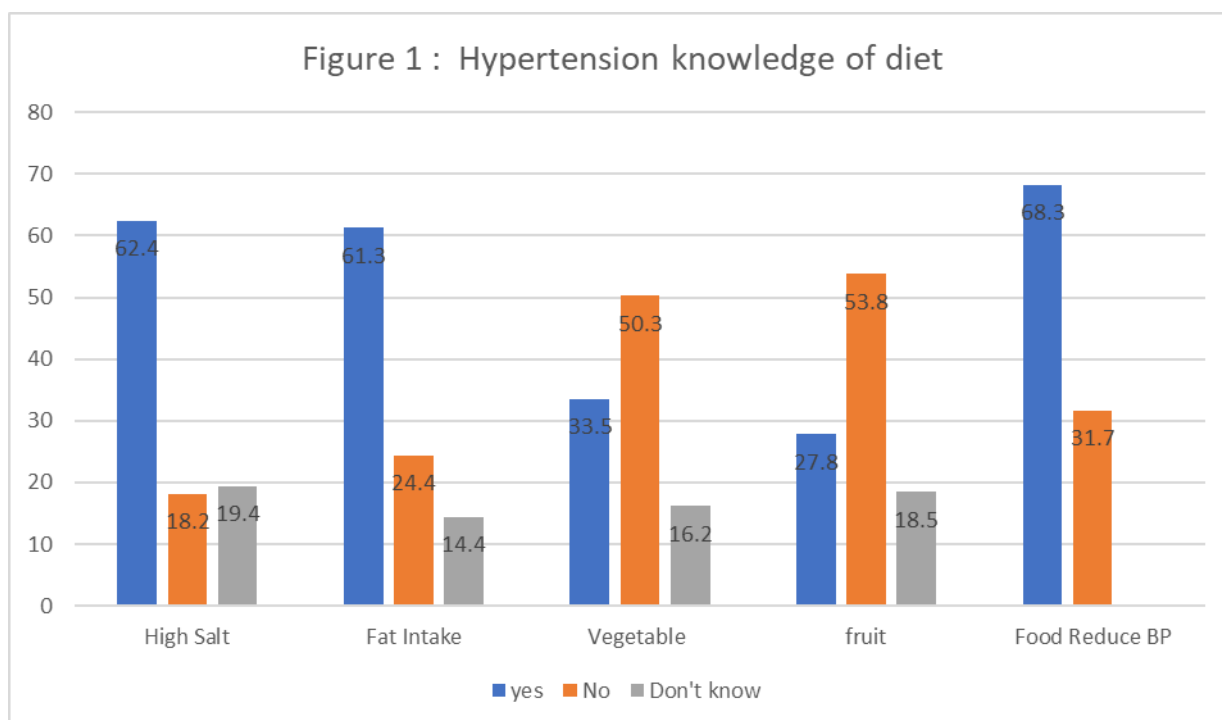
Almost third of the subjects do not know what hypertension is. More than quarter of the participants think BP is silent killer and nearly third of them think it is chronic diseases, 79.0% measured their blood pressure either on request by doctors or during health activities (Table 2)

Table 2: Hypertension Knowledge of the Participants

Do you know BP	Yes 288 (65.6)		No 151 (34.4)	
No (%)				
If yes, what do you know about it	No (%)			
Silent Killer	Genetics	Chronic Diseases	BP for adults > 139/89	Fatigue & Dizziness
76 (26.4)	41 (14.2)	87 (30.2)	71 (24.7)	13 (4.7)
Do you measure it?				
	Yes 347 (79.0)		No 92 (21.0)	
Who asked you to measure it				
Doctor	Friend	During Health activities	Others	Total
150 (43.2)	65 (18.7)	95 (27.4)	37 (10.7)	347 (100)

Almost two third of the participants think that taking high amount of salt is a risk factor for development of hypertension, and almost three fifth of the participants answered that, taking high amount of fat is a risk factor for

development of hypertension (Figure 1). Third and 27.8% of the participants think that, taking vegetables and fruits respectively were protective against developing BP.



Almost three quarter of the participant believed that, stress affecting hypertension and 60.8% think that practicing physical activities may reduce hypertension (Table 3).

Table 3: Stress, physical activities and smoking attitudes and high Blood Pressure

Is stress affecting BP		
Yes 296 (76.4)	No 74 (16.9)	Don't Know 69 (15.7)
If yes what type of stress?		
Physically 185 (58)	Mentally 113 (35.4)	Others 21 (6.6)
Do you think physical activities may reduce BP?		
Yes 267 (60.8)	No 91 (20.7)	Don't Know 81 (18.5)
Do you think smoking increase?		
Yes 233 (53.1)	No 125 (28.5)	Don't Know 81 (18.4)
Do you think alcohol intakes affecting BP		
Yes 264 (61.1)	No 77 (17.5)	Don't Know 98 (22.3)
Do you think excessive use of electronic device affecting BP?		
Yes 243 (55.4)	No 108 (24.6)	Don't Know 88 (20.0)
Is Obesity risk factor for BP		
Yes 263 (59.9)	No 115 (26.2)	Don't Know 61 (13.9)
Is diabetes risk factor for BP?		
Yes 231 (53.2)	No 89 (20.5)	Don't Know 113 (26.0)

Data (Table 4A) showed that, the age group 18 - 40 years thinks that intake of high salt as risk factor for hypertension was significantly higher than other age groups. Females were significantly think that, high salt is a risk factor compared to the males (Table 4B)

Table 4A: The participant's opinions of high salt as risk factor for Hypertension according to age

	less than 18 years	18 - 40	41 - 60	≥ 61 years	Total
Yes NO (%)	43 (50.0)	150 (71.8) *	59 (57.8)	22 (52.5)	274
No NO (%)	16 (18.6)	36 (17.2)	20 (19.6)	8 (19.0)	80
Don't Know NO (%)	27 (31.4)	23 (11.0)	23 (22.3)	12 (28.5)	85
Chi - Square Tests	Value	Df	Asymptotic Significance (2 - sided)		
Pearson Chi - Square	22.663 ^a	6	0.001		
Likelihood Ratio	22.843	6	0.001		

Table 4B: The participant's opinions of high intake of salt as risk factor for Hypertension according to sex

	Males	Females	Total
Yes No (%)	125 (58.7%)	147 (65.6%) *	272
No No (%)	52 (24.4%)	28 (12.5%)	80
Don't Know	36	49	85
Total	213	224	437
Chi - Square Tests	Value	Df	Asymptotic Significance (2 - sided)
Pearson Chi - Square	10.698 ^a	2	.005
Likelihood Ratio	10.813	2	.004

4. Discussion

Modifiable lifestyle factors including diet quality, smoking, physical activity, body weight and alcohol intake affect both total life expectancy and incidence of hypertension. low risk lifestyle factors body mass index 18.5 - 24.9, moderate to vigorous physical activity (≥30 minutes/day), and a higher diet quality score (upper 40%) and: never smoking (Damigou et al., 2023, Yanping et al., 2020). In this study 62.4% and 61.3 % of the participants (Figure 1) think that, taking food rich in salt and fat respectively, were risk factors for development of hypertension. Adopting a healthy lifestyle could substantially reduce premature mortality and prolong life expectancy in adults (Li et al., 2018). Adherence to Mediterranean diet (low in fat and salt, and rich in vegetables and fruits) protected against CVD development even if not sustained (Dominguez et al., 2021). The most effective preventative of NCDs strategy is the one that leads to changes in lifestyle with respect to diet, physical activities

and cessation of smoking (Budreviciute et al., 2020). In this study only 27.8% and third of them think that, taking fruits and vegetables respectively were preventive measure against developing hypertension (Figure 1). Adequate fruit and vegetable consumption (consuming ≥2 servings of fruits and ≥3 servings of vegetables a day), has been identified as optimal for health and prevention of NCDs. Recent evidence shows that, healthy diet should consist of at least 2 servings of fruits and at least 3 servings of vegetables a day (Smith et al., 2022). A high fruit and vegetable intake has been associated with reduced risk of hypertension. Fruit and vegetables contain potassium. Eating fruit and vegetables directly counters the effect of salt, which contains sodium, which raises the blood pressure (Madsen et al., 2023. Lim and Kim., 2020).

In this study (Table 2), results showed that two third of the participants knew hypertension, almost third think it is chronic diseases, and quarter of participants think it is silent killer. Sudanese descriptive cross - sectional community -

based study was conducted in Khartoum. Their results showed that, 9% are known hypertensive, 18.6% were diagnosed to be hypertensive, 44.9% are pre - hypertensive, and 27.6% have normal BP. Hypertension percentage was found to be increased with increasing in age, 3.3% of age group less than 35 years compared to 32.8% among age group 46 years and above (Awadalla et al., 2018). In this study, more than two fifth of them checked their blood pressure by doctors and quarter of them checked their blood pressure during health activities. A study showed that, 82.2% of individuals check their blood pressure frequently (Swed et al., 2023).

In our study three quarter of the participant believed that, stress may lead to hypertension and 60.8% think that practicing physical activities may reduce hypertension (Table 3). Scientists found that an overall healthy lifestyle, including high - quality diet, nonsmoking, healthy body weight, reduce life stress and moderate to vigorous physical activity, was associated with a lower risk of lower complications of hypertension and microvascular complications (Soliyev et al., 2019, Pan et al., 2023)

The relationship between psychosocial stress and hypertension has been hypothesized. In our study participant think that, stress may predispose to hypertension whether physical stress or mental stress (Table 3). Asyrian study showed that, the most common causes for hypertension from the perspective of participants were (90.1%) for stress and (69%) anxiety (Swed et al., 2023). The United States is one of the wealthiest nations worldwide. Americans have a shorter life expectancy compared to almost all other high - income countries, ranking 53rd in the world for life expectancy at birth in 2015 (WHO., 2018). Most likely due common risk factors such as unhealthy diet, smoking, stress and sedentary life. Adherence to lifestyle guidelines involving diet, exercise, and abstinence from smoking is associated with a very low risk of coronary heart disease. (Stampfer et al., 2000, WHO., 2019). A combination of at least four healthy lifestyle factors is associated with a reduction of the all - cause mortality risk by 66% (loef and Walsch., 2012).

A study showed that, the most common causes for hypertension were obesity (78.0%) and anxiety (69/0%) (Swed et al., 2023). In our study 59.9% think that obesity and 53.2% think DM were risk factors for hypertension (Table3). The visceral fat facilitates high dosage of adipokines in the portal vein to liver and other body tissues having serious implications seen in the form NCDs like diabetes, hypertension, heart diseases, non - alcoholic fatty liver diseases, kidney disorders, cancer and other health problems (Ochilova et al., 2020, Dhawan and Sharma., 2020). A study assessed the trajectories of lifestyle characteristics and their association with 20 - year cardiovascular disease incidence. The multi - adjusted analysis, age, sex, abnormal waist circumference, hypercholesterolemia, hypertension, and diabetes were positively associated with 20 - year CVD risk, explaining 56% of the excess CVD risk (Damigou al., 2023).

A Chinese study involved 51, 929 participants, stratified analyses showed that the association between a healthy

lifestyle and ischemic heart disease risk was stronger among younger participants (Su et al., 2023). In this study (table 4a) younger age group (18 - 40 years) has better knowledge than older age groups (age between 41 and 60 years and age 61 years and above) and the differences were significant. A study from middle east country illustrated that, almost age groups have shown good knowledge of diabetes, especially participants aged above 55 (Swed et al., 2023). There were significant associations between hypertension knowledge and gender, (P value < 0.05). Men have a higher hypertension knowledge than females (Swed et al., 2023). In our study females significantly think that, high salt is a risk factor for development of hypertension compared to the males (Table 4B). A community - based, cross - sectional study was conducted by a house - to - house survey, in north of Sudan. Illustrated that, the prevalence of hypertension in urban area was 35.7% and factors associated were increasing age, low educational level, diabetes mellitus, obesity, and central obesity (Bushara et al., 2016).

5. Conclusion

The knowledge of the participants concerning the relations between taking high salt or fat, and stress were risk factors for developing hypertension were good. Few of the participants consider taking vegetables or fruits may be preventive measure to develop hypertension. There was a need to encourage taking fruits and vegetables as daily basis due to their functional role in the developing good health and especially may reduce weight, and prevent from diabetes mellitus and hypertension. The most effective preventative of NCDs strategy is the one that leads to changes in lifestyle with respect to diet, physical activities, avoid stress and cessation of smoking.

Ethical considerations:

Participation in this study was voluntary, with prior informed consent and information about the research that was carried out. The survey was delivered and collected by the authors, maintaining the anonymity of the participants at all times. Participation in the study did not represent any risk to the participants at any time

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