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Lifestyle components associated with arterial hypertension among elderly people in the city of Ouagadougou

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Abstract

Arterial hypertension (AH) is a significant risk factor for cardiovascular disease in Africa. Like other developing countries, Burkina Faso is facing the emergence of this condition. Our study aimed to identify the lifestyle factors associated with AH in elderly people in the city of Ouagadougou. This descriptive cross-sectional survey took place over an eight-week period in March and April 2022, and covered a sample of 340 people aged 60 and over. Data were collected using a questionnaire, a BR 9012-bathroom scale (Camry, China) with an accuracy of 0.1 kg, an electronic tensiometer (OMRON HEM-7120-AF CP, Tokyo, Japan), a tape measure, and a measuring rod. The data were analyzed using SPSS software, version 24.0 (SPSS Inc., Chicago, IL, USA). The results indicated a 50% prevalence of arterial hypertension among the respondents. Principal component analysis showed that alcohol consumption and low physical activity were lifestyle factors associated with arterial hypertension in elderly people in Ouagadougou. Arterial hypertension is highly prevalent among the elderly in Ouagadougou. Strategies to prevent and better manage hypertension in this population group should focus on promoting a healthy lifestyle. These conclusions suggest prevention strategies based on nutritional education and the promotion of physical activity among these populations.

Keywords: Lifestyle; Prevalence; Hypertension; Chronic Desease Prevention; Elderly; Ouagadougou

1. Introduction

Arterial hypertension (AH) is the world's most prevalent chronic condition, affecting over 1.28 billion people worldwide[1]. It is also an emerging public health issue in developing countries[2]. The direct costs (drugs and care) and indirect costs (disability, work interruptions and loss of productivity) associated with managing hypertension represent a significant economic burden on national budgets and affect household incomes and the quality of life of those affected [3]. Several studies confirm that advanced age is a major risk factor, independently of other risk factors. Lifestyle management is recognized as an effective primary strategy for preventing, controlling and monitoring hypertension in adulthood[4]. The components of unhealthy lifestyles that can be controlled in older adults are risk factors associated with hypertension[5]. In Burkina Faso, a study of patients aged 60 and over hospitalized for stroke showed that the prevalence of hypertension was 64.13% [6]. A study carried out in the city of Bobo Dioulasso on elderly people reported an HTA prevalence of 61.36% [7]. However, the STEPS survey in Burkina Faso, revealed inappropriate lifestyle behavior among subjects aged 55 to 64 years old [8].

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The study aims investigate the lifestyle factors associated with hypertension in elderly people in the city of Ouagadougou.

2. Materials and methods

The study surveyed senior citizens' associations, mosques, churches, markets and board game areas in the city of Ouagadougou.

2.1. Population and type of study

This was a descriptive cross-sectional study conducted over an eight-week period. The study population consisted of individuals aged 60 and over who were living in the city of Ouagadougou.

2.2. Sampling

During the study period, the absence of an exhaustive database on the number of elderly people in the city of Ouagadougou meant that we could not determine the sample size through calculation. We surveyed three hundred and forty (340) subjects. The non-probability method and the reasoned choice technique were employed.

2.3. Study variables

The dependent variable was hypertension. Blood pressure and heart rate were measured twice on the left arm while the participant was sitting. The first and second readings were proceeded by 10 - 15 minutes and 2 - 3 minutes of waiting in a seated position respectively. The mean of the collected values was used as the final blood pressure and heart rate value. Respondents were considered to be hypertensive if they had systolic blood pressure of at least 140 mmHg and/or diastolic blood pressure of at least 90 mmHg or if they were currently taking of antihypertensive medication[1].

The independent variable was represented by the five controllable lifestyle components (sedentary lifestyle, physical activity, smoking, alcohol consumption and dietary intake). The variable indicators were classified as either major or minor criteria, according to their importance. A major criterion related to a question that had to be answered correctly. A minor criterion was related to a question that did not require a correct answer. Two modalities were used to assess lifestyle component. These modalities were selected based on the responses to the questions, which could be either right or wrong. For sedentary lifestyles, the two modalities were sedentary or non-sedentary. For smoking, it was necessary to be a smoker or not. For alcohol consumption and food consumption, the options were consumer or non-consumer. The lifestyle dimension was broken down into five components: sedentary lifestyle, physical activity, smoking, alcohol consumption and food consumption. These five components were made up of indicators or items, formulated as questions relating to the risky behaviors adopted by the people surveyed. In each case, it specified what had happened in the past and what was happening now.

Thus, the sedentary component included one indicator: the amount of time spent in a sitting each day (from 30 minutes to 1 hour, 1 hour to 3 hours, 3 hours to 5 hours or more than 5 hours). Levels of sedentary behavior were determined from these indicators, including the low level which was characterized by a daily time spent sitting of less than 3 hours; an average level characterized by a daily time spent sitting between 3 hours and 5 hours and a high level, characterized by a daily time spent in sitting of more than 5 hours. Physical activity was categorized based on two indicators: the duration of activity, which could be less than 15 minutes, between 15 and 45 minutes, or more than 45 minutes, and finally the intensity of the activity (low, medium, or high). Physical activity was considered good if the person had practiced in the past and currently practiced for more than 15 minutes at a medium or high intensity.

The tobacco consumption component included two indicators: tobacco consumption and non-consumption, exposure to tobacco smoke or non-exposure to tobacco smoke. The response was correct if the subject did not consume tobacco or smoke and had not been exposed to tobacco smoke in the past or currently. The alcohol consumption component had one indicator: consumption of alcoholic beverages or non-consumption of alcoholic beverages. The response was correct if the subject had never consumed alcohol.

The food consumption component consisted of five indicators. These were fruit consumption, vegetable consumption, fat consumption, sweetened beverage consumption and salt consumption. Fruit consumption was considered good if the subject had consumed fruit in the past and at currently does so. Similarly, vegetable consumption was considered good if the subject had consumed vegetables in the past and currently does so. As for fat consumption, the response was positive if the subject consumed artisanal vegetable oils or unheated industrial vegetable oils in the past and and

present. For sweetened beverages consumption, the subject had to be a past and present consumer of natural juices. As for salt, little or no salt should be consumed and none should be added to the daily intake.

2.4. Data collection techniques and tools

We conducted a survey using a questionnaire. We used a BR 9012-bathroom scale (Camry, China) accurate to 0.1 kg, an electronic tensiometer (OMRON HEM-7120-AF CP, Tokyo, Japan), a tape measure and a measuring rod were used to collect anthropometric data.

2.5. Data analysis

The data were coded and entered into an MS Excel database. Univariate analysis involved in calculating indicators of central tendency (mean and frequency) and dispersion (minimum - maximum, standard deviation and 95% confidence interval). Factors associated with hypertension were determined using analyses performed with SPSS version 24.0 software (SPSS Inc., Chicago, IL, USA).

3. Results

Both univariate and multivariate statistical analysis were explored. The former was used to calculate indicators of central tendency, while principal component analysis was used to identify associated lifestyle components.

Table 1 Anthropometric, blood pressure, and physiological characteristics of subjects categorized by gender.

	Men (n = 176)	**Women (n = 164)**	**Total of participants (n = 340)**
Age (years)	67.4 ± 5.8	657± 6.6	66.5 ± 6.3
Weight (kg)	71.4 ± 13.1	64 ± 15.0	67.81±14.5
Size (m)	1.71 ± 0. 1	1.6 ± 0.1	1.7 ± 0.1
WC (cm)	92.3 ± 11.8	91,3 ± 12,7	91.8 ± 12.2
BMI (kg.m-2)	24.1 ± 4.2	24.7 ± 5.3	24.42 ± 4.79
SBP (mmHg)	142.4 ± 21.4	139.9 ±19.6	141.2 ± 20.6
DBP (mmHg)	87.4 ± 12.7	82.9 ±12.1	85.2 ± 12.6
RHR (bpm)	74.8± 12.2	77.5 ± 11.8	76.1 ± 12.0

Legend: The numbers in the boxes represent the mean values ± standard deviations; n:sample size ; BMI: body mass index; WC: waist circumference; SBP: systolic blood pressure; DBP: diastolic blood pressure; RHR: resting heart rate.

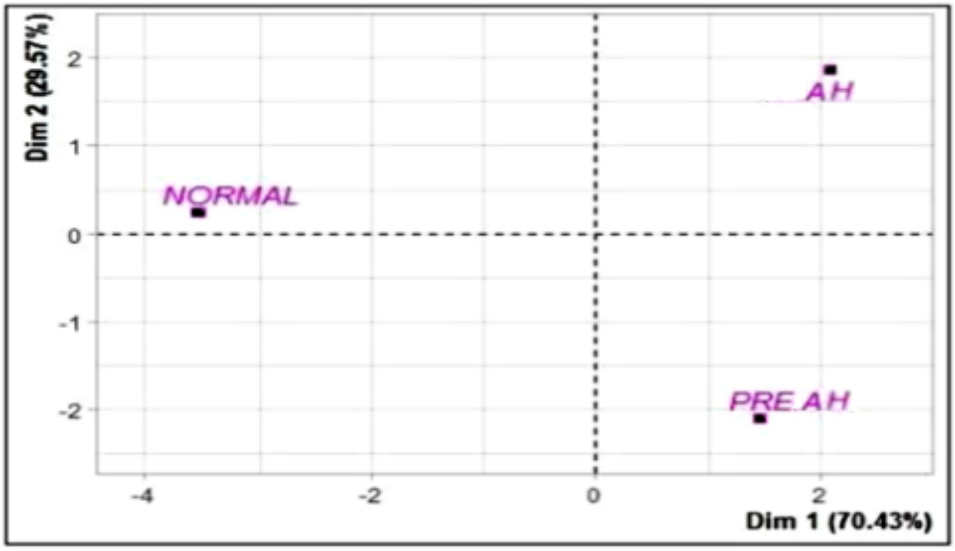
Out of a sample of 340 respondents, 48.24% were female, giving a male-to-female ratio of 1.07. The subjects' average age of the subjects was 66.48 ± 0.34 years, with extremes ranging from 60 to 100 years. BMI classifications showed that 9.12% of subjects were underweight, 52.65% were normal weight, 25.59% were overweight and 12.65% were obese. Waist circumference distribution revealed a prevalence a predominance of abdominal obesity at 61.47%. Classifications of hypertension status showed that 10.29% of the surveyed subjects were normotensive and 39.71% were prehypertensive.

3.1. Prevalence of hypertension

In our study, the mean systolic blood pressure (SBP) and diastolic blood pressure (DBP) of respondents were 141.2 ± 20.6 mmHg and 85.2 ± 12.6 mmHg respectively. The prevalence of hypertension was 50%.

3.2. Lifestyle components associated with hypertension

Principal component analysis was used to project the data onto a plane, and then to interpret the axes resulting axes. The lifestyle indicators selected for this section highlight the proportion of poor behavior observed. The figure below illustrates the different groups in the factorial plan.



Legend: AH: Arterial hypertension; PREAH: prehypertension

Figure 1 Distribution of the different groups in the factorial plane

Axis 1 (Dimension 1), which explains 70.43% of the variations, distinguishes between pathological states (prehypertension and hypertension) and normal states. In contrast, Axis 2 distinguishes between hypertension and prehypertension.

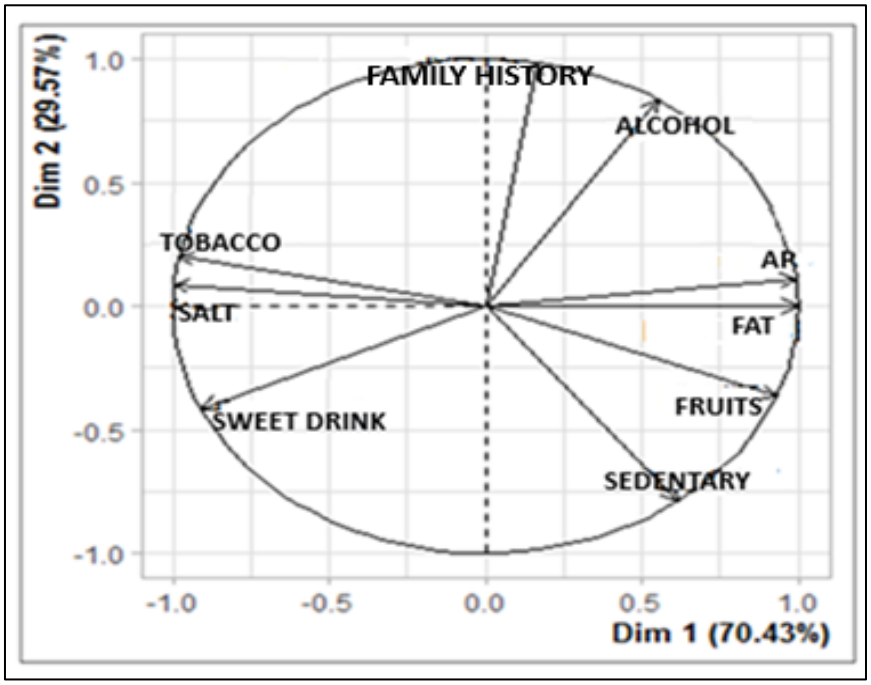


Figure 2 Correlation circle

All the selected indicators are well represented in the plan. Exploration reveals that the indicators of tobacco and salt consumption, as well as sweetened beverages consumption characterize individuals with negative values on axis 1. This group has normal hypertension. The latter exhibits poor behavior with regard to salt, tobacco and sugar-sweetened beverages. In fact, they have the lowest rates of positive behavior to these indicators. Physical activity, fat consumption and fruit consumption are seen more as poor behaviors characteristic of groups with positive values on axis 1: these are the prehypertension and hypertension groups.

In addition, the hypertension group has a positive value on axis 2 and is characterized by a family history of hypertension and poor drinking habits. The prehypertension group has a negative value on axis 2 and is characterized by a high rate of poor sedentary behavior.

3.3. Description of subject's lifestyle according to hypertension status

Table 2 Anthropometric, tension, and physiological characteristics of subjects by gender

	Normal (n = 35)		**PreAH (n = 135)**		**AH (n = 170)**	
	n (%)	95%IC	n (%)	95%IC	n (%)	95%IC
Sedentary	19 (54.3)	[45.9-62.7]	66 (48.9)	[44.6-53.2]	90 (52.9)	[49.1-56.8]
Physical activity	19 (54.3)	[45.9-62.7]	54 (40)	[35.8-44.2]	61 (35.9)	[32.2-39.6]
Tobacco	15 (42.9)	[34.5-51.2]	66 (48.9)	[44.6-53.2]	82 (48.2)	[44.4-52.1]
Alcohol	16 (45.7)	[37.3-54.1]	62 (45.9)	[41.6-50.2]	71 (41.8)	[38-45,5]
Fruits	35 (100)	[99-100]	124 (91.9)	[89.5-94.2]	160 (94.1)	[92.3-95.9]
Vegetables	35 (100)	[99-100]	135 (100)	[99-100]	170 (100)	[99-100]
Fat	2 (5.7)	[1.8-9.6]	3 (2.2)	[1-3.5]	3 (1.8)	[0.8-2.8]
Sweet Drink	6 (17.1)	[10.8-23.5]	27 (20)	[16.6-23.4]	39 (22.9)	[19.7-26.2]
Salt	1 (2.9)	[0-5.7]	18 (13.3)	[10.4-16.3]	23 (13.5)	[10.9-16.2]

At a 95% confidence level, the estimated proportion of individuals with good behavior with regard to salt consumption is 16.2% (in the hypertension group); 9.6% (in the normal group) have good behavior with regard to fat consumption; and 26.2% (in the hypertension group) have good behavior with regard to sweetened beverage consumption. Therefore, salt, fat, and sweetened beverage consumption are the lifestyle dimensions with the lowest levels of good behavior, regardless of the group considered. All subjects with normal hypertension had good fruit consumption habits. It should also be noted that 54.3% of these individuals were not sedentary and that the same proportion had a positive attitude towards physical activity and sport.

Among the prehypertension group, 91.9% adopted good fruit consumption habits. Sedentary lifestyles and tobacco consumption are indicators for which 48.9% of individuals in this group exhibited good behavior.

Among the hypertensive group, 94.1% showed good behavior with regard to fruit consumption, 52.9% with regard to sedentary lifestyles and 48.2% with regard to smoking. It should be noted that all subjects had good vegetable consumption habits.

4. Discussion

4.1. Lifestyle components associated with prehypertension and hypertension

The results of our study showed that 39.71% of respondents had prehypertension while 50% had hypertension. Prehypertension and hypertension were prevalent in our study. This may be because the study was carried out in an urban area and focused on a specific age group. The prevalence of prehypertension was found to be 34.8% in adults aged 15 and over in rural community in Nigeria[9] and 55.5% in Kenya[10] in adults aged 18 and over. Furthermore, the prevalence of prehypertension in our study was lower than that obtained in Côte d'Ivoire (52.5%)[11]. It should be noted that the average age of the population in this study was 35.9 ± 12.8 years[11].

The prevalence of hypertension was also high in our study. Results from another study showed a similarly high prevalence of hypertension in the same town [12]. However, the prevalence found in other studies lower, notably that in Burkina Faso [2] where the prevalence was 18% [13] and in China where the prevalence was 29%. These differences could be explain by advanced age these differences, as several studies have shown that the prevalence of AH increases with age [9,11]Our study involved people aged 60 or over whereas the two aforementioned studies that included subjects of younger ages. Conversely, the prevalence found in our study was lower than in a study carried out in South Africa involving subjects aged 50 and over (77.3%) [14]. The latter's national scope could explain this difference.

Furthermore, our results are consistent with those of a study conducted in Ghana, which found a prevalence of 51.1% among individuals over 50 years of age [15]. Our results are also similar to those of a study carried out in Ouagadougou among subjects over 60 (48.31%) [6]. In the latter study the proportion of men was almost double that of women (66.57% versus 33.43%) which could explain why the prevalence was slightly lower than in our study (48.31% versus 50%). Studies have shown that with age, hypertension is more prevalent in women than men. This may be linked to estrogen deficiency, which increases arterial stiffness [16].

4.2. Lifestyle components associated with prehypertension

This study examined the lifestyle factors associated with prehypertension in elderly people in the city of Ouagadougou. Principal component analysis revealed that a sedentary lifestyle, low fruit intake and high saturated fat consumption were the lifestyle factors associated with prehypertension in elderly people in the city of Ouagadougou. These results are consistent with those of a study carried out in Tunisia on subjects aged between 20 and 60. This study revealed excessive saturated fatty acid consumption in individuals with prehypertensive and hypertensive condition [17]. additionally, a study investigating the prevalence and risk factors associated with prehypertension in women identified a sedentary lifestyle (53.2%) as a major risk factor[18]. A sedentary lifestyle is a major risk factor for cardiovascular disease, including prehypertension, and all-cause mortality[19].

4.3. Lifestyle components associated with hypertension

Our results revealed that the lifestyle factors associated with hypertension were family history, alcohol consumption and low levels of physical activity.

Family history is characteristic of essential hypertension, which accounts for 95% of cases where the cause is unknown. According to the literature for this type of hypertension is linked to genetic predisposition. Therefore, having parents with chronic hypertension increases likelihood of their offspring being hypertensive. In the hypertensive group, men were more prevalent than women (53.53% versus 46.47%). This could justify alcohol consumption being a risk factor for hypertension, given that men consume more alcohol than women according to several studies [8,20]. The results of our study are consistent with those of a study carried out on subjects over the age of 50 in which the consumption of alcoholic beverages was associated with hypertension[21]. Our study showed that physical inactivity was associated with hypertension in the elderly. Indeed, the physiological changes linked to ageing affect various bodily systems, notably the musculoskeletal and cardiovascular systems, thereby reducing the physical aptitude of the elderly and consequently influencing their ability to engage in physical activities [22]. Our results are consistent with those of a study in which physical inactivity was identify as a major risk factor for non-communicable diseases in seniors' subjects[14]. Furthermore, despite being based on different populations, our results corroborate those of a study carried out in Benin in which physical inactivity was associated with hypertension [23]and an another study carried out in Senegal, which reported a high prevalence of sedentariness (64.7%) associated with an increased risk of cardiovascular disease [24].

5. Conclusions

At the end of the investigations and analysis of the results, it emerged that arterial hypertension was prevalent among the elderly in Ouagadougou, affecting 50% of this population. The study also showed that the consumption of alcoholic beverages and low levels of physical activity were associated with high blood pressure in this age group. Furthermore, our results revealed that pre-hypertension was associated with a sedentary lifestyle, insufficient fruit consumption and high fat intake. However, if no action is taken, the prevalence of hypertension could increase in the years to come. s Promoting a physically active lifestyle at all ages, alongside nutritional advice, is necessary to combat hypertension in the elderly and its many complications.

Compliance with ethical standards

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