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Study of Risk Factors for Cardiovascular Disease in an Urban Community in Togo: A WHO Steps-Wise Approach in Bafilo

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Abstract

Introduction: Risk factors are one of the leading causes of mortality and disability in all countries, regardless of their level of economic development. This study aimed to determine the prevalence of cardiovascular disease risk factors in the Bafilo population. **Materials and Methods:** This descriptive, cross-sectional study was conducted from 20 November to 19 December 2019, involving a representative sample of 419 individuals aged 18 - 69 years and living in selected households in Bafilo. The study was carried out with the assistance of the National Institute of Statistics and Economic and Demographic Studies. Pregnant women and individuals who had lived in the area for less than six months were excluded. WHO-standardised STEPS tools were used to collect data. STEPS 1 collected demographic information and behavioural measures, STEPS 2 collected physical measurements using valid instruments and techniques, and STEPS 3 collected blood glucose measurements. The analysis was performed using Stata 16 software. **Results:** Our sample consisted of 419 participants, including 103 men (24.6%) and 316 women (75.4%), giving a male-to-female ratio of 0.3. The 30 - 39 years age group was the most represented, accounting for 27.0% of participants. The prevalence of the following risk factors was as follows: high blood pressure (32.1%), diabetes (20.1%), alcoholism (7.6%), smoking (1.9%), obesity (21.2%), and being overweight (28.1%). The respective prevalence rates were 51.8% for abdominal obesity and 11.0% for sedentary behaviour. **Conclusion:** Cardiovascular disease risk factors, particularly hypertension and diabetes, are prevalent in Bafilo. This highlights the need to develop plans and strategies to combat this issue, bearing in mind that

"today's risk factors are tomorrow's diseases".

Keywords

Risk Factors, Cardiovascular, STEPS Approach, Bafilo, Togo

1. Introduction

A cardiovascular risk factor is a factor that can alter the likelihood of developing cardiovascular disease (CVD) [1]. Stroke is currently the second leading cause of morbidity and mortality worldwide [2], behind CVD [3]. In Sub-Saharan Africa, stroke is the third leading cause of mortality and motor disability in neurological healthcare [4]. It accounts for 46% of cases at the Centre National Hospitalier Universitaire in Cotonou [5]. In Togo, studies on stroke report a hospital prevalence ranging from approximately 33% to 49%, depending on the centre [6] [7]. Stroke occurrence is influenced by clearly established risk factors, most of which are associated with lifestyle (e.g., poor diet and sedentary behaviour) and can currently be effectively addressed through primary prevention [2]. Due to a lack of population data on the extent of non-communicable diseases (NCDs) in Togo, the STEPS Togo 2010 survey was conducted [8]. This survey provided factual indicators on the prevalence of NCDs' risk factors to develop appropriate policies and strategies to combat them. However, since then, Togo has lacked reliable, periodic epidemiological data and data on the proportion of the population at high risk of CVD due to a lack of available resources. A survey was therefore conducted in Bafilo, a previously little-studied urban Muslim area, to provide an overview of the prevalence of risk factors for CVD. The aim of this study was to describe the risk factors for CVD in an urban community, specifically in Bafilo.

2. Materials and Methods

2.1. Study Center, Type, and Period

The study was conducted in Bafilo, a town in the Assoli Prefecture in the Kara Region of Togo, 357.2 km from Lomé. The 30-day descriptive cross-sectional study was conducted from 20 November to 19 December 2019.

2.2. Study Population

The target population was the people of Bafilo. The study included men and women aged 18 to 69 who lived in randomly selected Bafilo households and had resided there for at least six months. All participants gave their informed consent before and during the study. People under the age of 18 or over the age of 69, as well as those who had been living in Bafilo for less than six months, were excluded from the study. Those who did not consent to participate in the survey, those who were visited twice without success, those unable to answer the questions and pregnant women were also excluded.

The minimum sample size was calculated using the methodology defined by Fellegi *et al.* [9]. The formula uses the following parameters: $n = \frac{1}{\frac{1}{N} + e^2}$, N = the estimated number of households in the project area (4000), n = the determined sample size, e = the margin of error (0.05). This gives n = 364 participants.

Households were selected using a stratified sampling process. Under the supervision of the National Institute of Statistics and Economic and Demographic Studies (INSEED), 364 households in Bafilo were randomly selected using a step sampling method with a 15% sample boost. Within each selected household, one individual was chosen to participate using the Kish method [10]. A household is defined as all the people who normally eat meals together.

2.3. Assessment and Data Collection Tools

Local interviewers were selected and trained. Data were collected using WHO-standardised STEPS tools [11]. Demographic information and behavioural measures were collected in STEPS 1. These included participant identification number, gender, age, years of schooling, highest level of education, ethnicity, main occupational activity, average household income, tobacco, alcohol, fruit and vegetable consumption, physical activity, and history of high blood pressure and diabetes. Information on lifestyle and sedentary behaviour was also collected. STEPS 2 involved physical measurements, including systolic and diastolic blood pressure, body mass index (BMI) based on height and weight, waist circumference, hip circumference and heart rate, using valid instruments and techniques. STEPS 3 involved a biochemical measurement of blood glucose. The selected person receives the participant information form. This was read aloud or translated into the local language if necessary. The interviewers brought the following items: participant information forms, consent forms, an interview follow-up form, a question-by-question guide, presentation cards and a form to give to participants with their relevant health information. Consent is obtained in writing and by signature.

2.4. Definition of Terms

A respondent was considered to have hypertension if they were known to be hypertensive, were taking antihypertensive medication, or had a systolic blood pressure (BP) of at least 140 mmHg and/or a diastolic BP of at least 90 mmHg in three measurements. Similarly, any respondent who was known to be diabetic, or who had a fasting capillary blood glucose level greater than or equal to 1.26 g/L or a postprandial level greater than or equal to 1.40 mg/dL, was classified as diabetic. Anthropometric parameters (weight and height) were used to calculate body mass index (BMI) [12]. Overweight was defined as a BMI between 25 and 30 kg/m^2, while obesity was defined as a BMI of 30 kg/m^2 or greater. Abdominal obesity was assessed based on the waist-to-hip ratio, using the International Diabetes Federation's standards [13]. A sedentary lifestyle was defined as engaging in less than 150 minutes of moderate physical activity per week, or the equivalent. Alcohol consumption was

defined as consumption during the 30 days preceding the survey. Consumption was considered excessive if it exceeded five standard drinks on at least three occasions per month for men, or four standard drinks on at least two occasions per month for women. Smoking was defined as the daily or occasional use of tobacco products and/or derivatives, including smoking and chewing.

2.5. Statistical Analysis

Data collected on the STEPS instruments was entered using a Microsoft Excel file on Microsoft Office 365. The analysis was performed in Stata 16. Summary statistics were used to examine primary and demographic variables, including means, medians, standard deviations, minimum and maximum values for continuous variables, and frequencies and proportions for qualitative variables.

2.6. Ethical Considerations

All data and records generated during this study remain confidential in accordance with the rules defined by the Bioethics Committee for Health Research (CBRS) and the Health Insurance Portability and Accountability Act (HIPAA) on subject privacy. The selected individuals were informed about the study using the patient information form, and their consent was obtained. This study was approved by the CBRS.

3. Results

3.1. Sociodemographic Characteristics

A total of 419 people participated in the survey, including 103 men and 316 women. The male-to-female sex ratio was 0.3. The 30 - 39 years age group was the most represented, with 113 respondents (27.0%). Figure 1 shows the distribution of respondents by age group and gender.

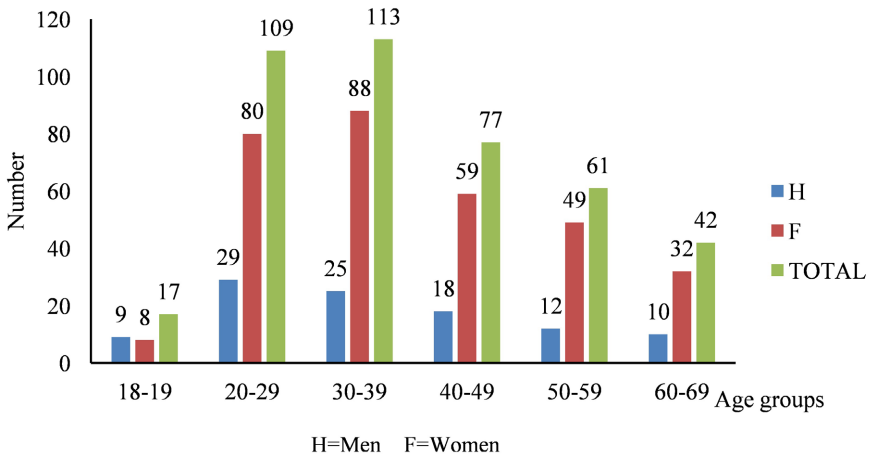

Figure 1. Distribution of respondents by age group and gender.

Of the respondents, 157 had no education and 11 had a university degree. We

found that 176 (42.1%) of the respondents were housewives, followed by the self-employed and informal workers, who accounted for 37.6% of the study population. Table 1 shows the distribution of respondents by education level and occupation.

Table 1. Distribution of participants according to educational level and professional activity.

	n	%
Level of education		
No formal education	157	37.5
Primary	195	46.5
Secondary	56	13.4
Higher	11	2.6
Professional activity		
Housewife	176	42.1
Self-employed, informal	157	37.6
Farmer, peasant	9	21.5
Public sector employee	36	8.6
Pupil, student	16	3.8
Private sector employee	14	3.4
Not working, unemployed	6	1.4
Retired	4	1.0

3.2. Prevalence of Cardiovascular Disease Risk Factors

Figure 2 illustrates the risk factors associated with CVD. The prevalence of hypertension in the general population was found to be 32.1%. Of those surveyed, 148 (35.4%) had never had their blood pressure measured. Hypertension prevalence increased with age, ranging from 7.0% among 20- to 29-year-olds to 46.3% among 60- to 69-year-olds. A doctor or healthcare professional had prescribed antihypertensive treatment for 32.2% of known hypertensive patients.

According to the survey results, 80.4% of respondents had never had their blood sugar checked, regardless of gender or age. Of those known to have diabetes, 46.2% were taking oral antidiabetic medication and 23.1% were receiving insulin injections at the time of the survey. Tobacco use was only observed among males. Alcohol consumption was most prevalent among 20- to 29-year-olds, followed by 30- to 39-year-olds, accounting for 31.2% and 28.1% of drinkers, respectively. Men were more likely to consume alcohol than women, at 65.62% and 34.37% respectively. The average waist-to-hip ratio was 0.95 for men and 0.87 for women.

4. Discussion

4.1. Key Findings

Our study reported a female predominance, which is identical to the result re-

ported in the 2010 STEPS Togo survey [8]. This could be explained by the high proportion of women in households in the city of Bafilo due to polygamy, and by the fact that men were absent from their households during the visits due to work commitments.

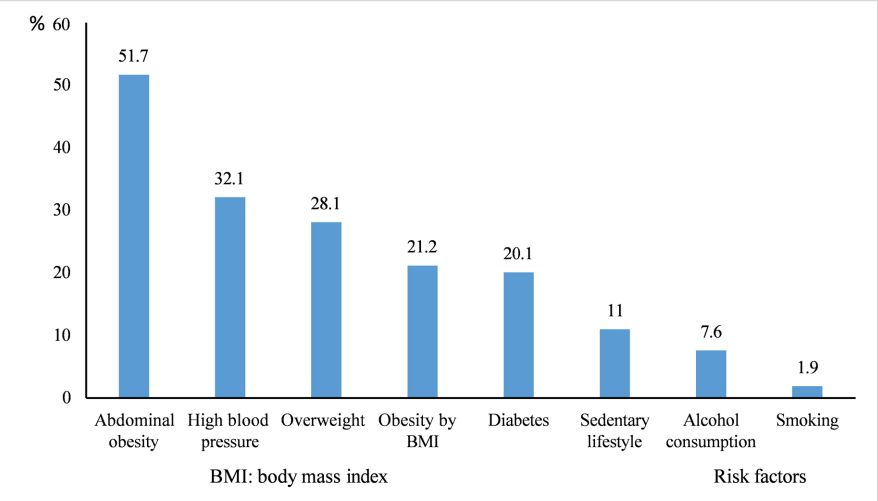

Figure 2. Distribution of respondents according to CVD risk factors.

In our study, 37.5% of respondents were illiterate, while 2.6% had a university degree. These results are consistent with those of the 2010 STEPS Togo survey, which found an illiteracy rate of 41.3% and 2.5% of respondents with a university degree or equivalent [8]. This significant illiteracy rate could be explained by the precarious situation of the population, who are in survival mode, and by certain family constraints and imperatives that prevent young people from attending school and force them to work in agriculture from a young age. The proposed solution would be to improve living conditions and promote the education of children, especially girls. The study revealed that 39.7% of people worked in the informal sector. This rate is significantly lower than that found in the 2010 STEPS Togo survey, which was 71.2% [8].

The prevalence of tobacco use in the general population of Bafilo was 1.9%. This is lower than the figure of 8.5% found in the final report of the 2010 STEPS Togo survey [8]. It was also higher than that found by Baragou *et al.* in Lomé in 2010 (9.3%) [14] and by Bonaldi *et al.* in France (29%) in their estimation of the impact of tobacco use on the burden of cardiovascular and cerebrovascular diseases in France [15]. This low level of tobacco consumption in our study can be explained by the effectiveness of the measures implemented to combat NCDs, particularly CVD, following the 2010 STEPS Togo survey. The prevalence of alcohol consumption in the general population in Bafilo was 7.6%, which is lower than the national result of the 2010 STEPS Togo survey (53.7%) [8] and the result of the study by Baragou *et al.* (11%) [14]. This could be due to the significant Muslim population in Bafilo, most of whom consider alcohol consumption to be sinful and wasteful. Raising awareness of the harmful effects of alcohol on health and controlling the

strength and quality of alcohol are appropriate measures to further reduce alcohol consumption in Bafilo. According to our survey, the rate of physical inactivity was 11%, like that reported in the 2010 STEPS survey [8]. The prevalence of hypertension in the population of Bafilo was 32.1%. This figure is higher than that found in the 2010 STEPS Togo survey (19%) and the 2010 Baragou *et al.* study (26.6%) in Lomé [14]. It was also similar to the prevalence found by Baragou *et al.* in the workplace in Lomé, which was 28.9% [16]. It is also like the prevalence found by Yayehd *et al.* in Lomé in 2011 (36.7%) [17]. Our findings are consistent with our observations of the lifestyle of the Bafilo population, which involves excessive consumption of sugar, oil and salt. This lifestyle is potentially responsible for the increase in hypertension prevalence.

In the Bafilo survey, the prevalence of diabetes was 20.1%. This is higher than the results found in the 2010 STEPS Togo survey (2.6%) [8] and the work of Baragou *et al.* (7.3%) in 2010 [14]. This very high proportion of diabetics is thought to be mainly linked to obesity and poor lifestyle choices, such as excessive consumption of sugar and oil. The survey also revealed that 80.4% of respondents had never had their blood sugar levels checked. Among known diabetics, only 46.2% were receiving oral antidiabetic treatment, while 23.1% were receiving insulin treatment. This lack of awareness of glycemic status, coupled with the low proportion of people receiving treatment, could lead to complications. There is therefore an urgent need to raise awareness of diabetes and its complications among the population of this city in Togo, and to encourage preventive behaviours by mobilising all relevant health professionals.

4.2. Limitations and Constraints of the Study

Our study was conducted in Bafilo, the capital of the Assoli region in Togo, where measuring blood pressure and assessing blood glucose levels was difficult. With the onset of the pandemic and the resulting health measures, there was a loss of confidence in healthcare workers among the population, who were more cautious about surveys. This study was conducted in a predominantly Muslim region, which may have skewed certain behavioural factors related to alcohol and tobacco use. Nevertheless, our study is of great interest as it has provided us with statistics on the health of the Bafilo population, which will help to prevent cardiovascular disease.

5. Conclusion

CVD remains one of the biggest threats to health worldwide, particularly in low-income countries, where it has a significant impact. This study is based on a descriptive, cross-sectional analysis of CVD risk factors in Bafilo. The study revealed high prevalence rates of hypertension and diabetes. A significant proportion of respondents had never had their hypertension and diabetes status assessed by having their blood pressure and blood sugar levels measured. The prevalence of smoking and alcohol consumption was low. However, the prevalence of being over-

weight or obese remains high compared to previous studies. The survey also revealed that only a small proportion of people were receiving treatment for hypertension or diabetes. This work benefits decision-makers, especially health officials, by providing them with recent factual data on CVD risk factors. This enables various NCDs' prevention and control programmes to develop appropriate policies and strategies to combat CVD, because "today's risk factors are tomorrow's diseases".

Authors' Contributions

Yaovi Mignazonzon Afassinou: Visualization, writing—review & editing. Soulemane Pessinaba: Validation, review & editing. Kokou Mawuko David Adjrakou: Writing—original draft, validation. Borgatia Atta: Review & editing. Wiyaou Dieu-DonnéKaziga: Review & editing. Machihude Pio: Review & editing. Soodougoua Baragou: Review & editing. Findibe Damorou: Supervision, review & editing. Mofou Belo: Conceptualization, supervision, visualization, writing—review.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Abbreviations

CVD: Cardiovascular Disease
NCDs: Non-Communicable Diseases
WHO: World Health Organization
BMI: Body Mass Index
INSEED: National Institute of Statistics and Economic and Demographic Studies
BP: Blood Pressure
CBRS: Bioethics Committee for Health Research
HIPAA: Health Insurance Portability and Accountability Act