

# Knowledge, Attitudes, and Practices Regarding Hypertension Among Soldiers of the Parakou Garrison in Benin in 2019

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**Abstract:** *Introduction:* The objective of this study was to assess the knowledge, attitudes, and practices of military personnel regarding hypertension in Parakou in 2019. *Materials and methods:* This was a cross-sectional study. It included all the soldiers of the Parakou garrison, present at work during the investigation period, from October 24 to November 08, 2019, and having given their written consent. Members unavailable after two visits were excluded. An interview was held with each respondent using a questionnaire. Knowledge, attitudes, and practices were assessed by a series of items marked 1 or 0 (correct or incorrect answer) and classified into four categories according to the score. *Results:* A total of 266 soldiers were included. The mean age was  $34.1 \pm 5.5$  years, and the male/female sex ratio was 7.1. Knowledge about hypertension was good among 33.5% of soldiers and attitudes were right among 82.0%. None of them had good practice and only 17.3% had a good level of knowledge, attitudes, and practices. The function was associated with the level of knowledge, attitudes, and practices ( $p < 0.001$ ). *Conclusion:* The level of knowledge, attitudes, and practices towards hypertension of the targeted soldiers was low. The awareness of the Beninese soldiers on the prevention of hypertension should be reinforced.

**Keywords:** Knowledge, Attitudes, Practices, Hypertension, Soldiers

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## 1. Introduction

Hypertension is a public health issue worldwide. Out of 17 million deaths per year due to cardiovascular disease, 9.4 million are attributable to complications of hypertension [1]. It is estimated that 1.28 billion people between the ages of 30 and 79 suffer from hypertension, with two-thirds of them living in low- or middle-income countries [1]. In 2019, a prevalence of 31.8% was estimated among adults 18 years of age and older in sub-Saharan Africa during MMM (May

Measurement Month) surveys [2]. In Benin, the national prevalence of hypertension was 25.9% in 2015 [3]; more than half of hypertensives were unaware of their status.

Adult hypertension has no organic cause in most cases. Its occurrence is associated with risk factors such as: unbalanced diet, low physical activity, smoking, stress, and obesity. Hypertension is therefore preventable by adopting a healthy lifestyle. Complications can be avoided by early detection and effective treatment. Despite the availability of simplified measuring devices and low-cost treatments, hypertension remains insufficiently detected, treated, and controlled in

Sub-Saharan Africa [4, 5]. This situation may be partly due to the lack of knowledge, information, and misperceptions about hypertension.

Studies conducted among soldiers in different countries have revealed high prevalences of hypertension risk factors such as alcohol consumption, smoking, and stress [6, 7]. Hypertension in the soldiers is an important problem because it affects very active people who work for the security and defense of the country. The complications of hypertension can be dramatic in this socio-professional group. Prevention of hypertension is necessary in the soldiers, but there is a lack of information on this target population in Benin. The objective of this study was to assess the knowledge, attitudes, and practices (KAP) of the soldiers towards hypertension in Parakou in 2019.

## 2. Methods

### 2.1. Work Frame

The study was conducted at the garrison of Parakou city, located in the department of Borgou, in the north of Benin. Parakou is the second largest city of Benin with a population estimated at 255,478 inhabitants during the second general census of 2013 [8]. It is subdivided into 3 districts and 58 neighborhoods. There are two university hospitals in the city: the departmental hospital and the military hospital.

### 2.2. Study Design, Population, and Data Collection

This was a cross-sectional study. The study population consisted of all the soldiers working in the Parakou garrison in 2019. All the soldiers of the garrison, present at the workstation during the period of the survey and having given their informed written consent, were included. The soldiers unavailable after two visits were excluded.

Data collection was carried out from October 24 to November 08, 2019. The data collection technique was a structured individual interview in face-to-face mode, and the tool, a standardized questionnaire.

### 2.3. Variables and Data Analysis

The main variables were knowledge, attitudes, and practices. They were assessed according to the model proposed by Essi [9]. Each variable was assessed by a series of items marked 1 (correct answer) or 0 (incorrect answer) and was classified according to the maximum score quartiles. Knowledge was assessed by twenty-three questions and classified into four categories: “good” if the score  $\geq 18$ ; “average” if the score is between 12 and 17; “insufficient” if

the score is between 7 and 11; and “bad” if the score  $< 7$ . The attitudes were assessed by four questions and classified into four categories: “right” if the score is equal to 4; “approximate” if the score is equal to 3; “wrong” if the score is equal to 2 and “harmful” if the score is equal to 0 or 1. The practices were assessed by ten questions and classified into four categories: “good” if the score  $\geq 9$ ; “average” if the score is between 6 and 8 “insufficient” if the score is between 3 and 5; and “bad” if the score  $< 3$ . An overall KAP score was calculated by summing the scores (0-37). The KAP level has been classified into four categories: “good” if the score  $\geq 28$ ; “average” if the score is between 19 and 27; “insufficient” if the score is between 10 and 18; and “bad” if the score  $< 10$ .

The independent variables were age, sex, grade, professional seniority, and function.

Data were entered using Epi Data 3.1 software and analyzed using Epi Info 7.5.1 software. (CDC, USA). Data consistency has been checked. The means are presented with their standard deviation and the proportions are expressed as percentages. A logistic regression was performed to identify the factors associated with the good level of KAP. Odds ratios were calculated. The significance level (p-value) of 0.05 was retained for the comparisons.

### 2.4. Ethical Considerations

The Chief of Staff of the Army of Benin authorized the investigation. The protocol received the favorable opinion of the educational committee of the National School of Higher Technicians in Public Health and Epidemiological Surveillance (ENATSE). The data was collected anonymously; written informed consent has been obtained from the soldiers. The exploitation of the data was done in complete confidentiality.

## 3. Results

### 3.1. Sample Characteristics

Out of 276 soldiers met during the collection period, 266 were included in the study. The participation rate was 96.4%; one refusal was registered and 9 were not available. The average age was  $34.1 \pm 5.5$  years with extreme values of 23 years and 52 years. The age group under 40 was the most represented, at 83.1% (Table 1); there was a male predominance (87.6%). Among the soldiers, 63.5% had seniority greater than or equal to 10 years and 71.8% were men of rank (Table 1). The average professional seniority was  $12.1 \pm 5.4$  years.

**Table 1.** Factors associated with the good level of knowledge, attitudes, and practices towards hypertension, Parakou garrison 2019.

	Total Number (%)	Good level of KAP			
		Number (%)	OR	95% CI	p
Age (years)					
<40	221 (83.1)	39 (17.6)	1		
$\geq 40$	45 (16.9)	7 (15.6)	0.9	0.4-2.1	0.735
Sex					

	Total Number (%)	Good level of KAP			
		Number (%)	OR	95% CI	p
Male	233 (87.6)	41 (17.6)	1		
Female	33 (12.4)	5 (15.2)	0.8	0.3-2.3	0.728
Seniority (years)					
<10	97 (36.5)	13 (13.4)	1		
≥10	169 (63.5)	33 (19.5)	1.6	0.8-3.2	0.206
Grade					
Men of rank	191 (71.8)	28 (14.7)	1		
Non-Commissioned Officer	75 (28.2)	18 (24.0)	1.8	0.9-3.6	0.073
Function					
Other	96 (36.1)	27 (28.1)	1		
Infantryman	170 (63.9)	19 (11.2)	0.3	0.1-0.6	<0.001

KAP: Knowledge, Attitudes and Practices; OR: Odds Ratio; CI: Confidence Interval

### 3.2. Information Relating to Knowledge, Attitudes, and Practices Towards Hypertension

Table 2 shows information on the knowledge level, attitudes, and practices towards hypertension in the soldiers surveyed. Knowledge about hypertension was good in 33.5% of them. We observed right attitudes in 82.0%, average practices in 63.9%. None of the soldiers had a good practice.

**Table 2.** Distribution of soldiers according to their level of knowledge, attitudes, and practices towards hypertension, Parakou garrison 2019.

	Number	%
Knowledge		
Good	89	33.5
Average	126	47.4
Insufficient	35	13.1
bad	16	6.0
Attitudes		
Right	218	82.0
Approximate	45	16.9
Wrong	3	1.1
Harmful	0	0.0
Practices		
Good	0	0.0
Average	170	63.9
Insufficient	23	8.7
Bad	73	27.4

KAP: Knowledge, Attitudes and Practices

The level of KAP was good in 17.3% of cases, average in 66.5%, insufficient in 13.2% and bad in 3.0%. The average knowledge score was  $15.1 \pm 4.7$  and the average attitude score was  $2.87 \pm 0.8$ . The average practice score was  $3.9 \pm 1.0$  and the average KAP score was  $21.8 \pm 5.1$ .

Less than half of the sample (48.1%) declared having received information or advice at least once on hypertension from a health worker. Regarding information relating to knowledge (Table 3), nearly two-thirds (63.5%) had chosen the correct definition of hypertension. The most cited symptoms of hypertension were dizziness (69.6%) and palpitation (67.7%); the most cited risk factors were the stress (80.5%) and the physical inactivity (77.4%). The most cited complications of hypertension were the paralysis of the face and/or limbs (85.7%), and the cardiac complications (81.6%). The majority recognized that hypertension is detected by measuring blood pressure (73.3%) and that it

requires medical monitoring (89.5%).

**Table 3.** Distribution of soldiers according to their knowledge of hypertension, Parakou garrison in 2019.

	Number (YES) N=266	Frequency (%)
Definition		
Increased blood pressure in the arteries	169	63.5
Symptoms		
Headache	153	57.5
Neck heaviness	119	44.7
Vertigo or dizziness	185	69.6
Palpitations	180	67.7
Risk factor		
Physical inactivity	206	77.4
Excessive salt consumption	152	57.1
High fat diet	187	70.3
Tobacco	130	48.9
Stress	214	80.5
Diabetes	155	58.3
Obesity	192	72.2
Heredit	165	62.0
Complications		
Paralysis of the face and/or limbs	228	85.7
Kidney complications	164	61.7
Cardiac complications	217	81.6
Blindness	148	55.6
Foot amputation	127	47.7
Other information		
Hypertension often asymptomatic	149	56.0
Hypertension non-communicable disease	237	89.1
Hypertension detection by blood pressure measurement	195	73.3
Hypertension requires long-term treatment	161	60.5
Hypertension requires follow-up by a health worker	238	89.5

Table 4 shows information relating to the attitudes and practices of soldiers. More than half of them (58.3%) thought that hypertension was curable and about a fifth (20.7%) that it could be due to bad luck or a bewitchment. The majority (74.4%) agreed that it could be avoided through a healthy lifestyle and almost all (92.1%) agreed that it is necessary to check blood pressure regularly. Regarding practices, more than half of the soldiers (57.1%) consumed alcohol during the last 30 days and 10.2% smoked (Table 4). Almost all felt stress at work (93.6%) and had a low consumption of fruits

and vegetables (99.6%) (Table 4). More than a fifth (21.5%) liked to eat salty food, 29.7% had a physical inactivity, and 10.1% were sedentary (Table 4). The majority (79.0%) had their blood pressure checked more than a year ago (Table 4).

**Table 4.** Distribution of soldiers according to their attitudes and practices towards hypertension, Parakou garrison 2019.

	Effective (Total =266)	Frequency (%)
<b>Attitudes</b>		
Hypertension often curable	155	58.3
Hypertension due to bad luck or bewitchment	55	20.7
Avoidable hypertension thanks to a healthy lifestyle	198	74.4
Need for blood pressure control	245	92.1
<b>Practices</b>		
Alcohol consumption in the last 30 days	152	57.1
Smoking (cigarettes)	27	10.2
Stress at work	249	93.6
Excessive salt consumption	56	21.0
Physical inactivity (<150 minutes / week)	79	29.7
Sedentary (Time spent in a sitting or lying position per day $\geq$ 4 h)	28	10.5
Low fruits and vegetables consumption (< 5 servings of 80g/day)	265	99.6
Time to blood pressure measurement (>1 year)	210	79.0

The function was significantly associated with the level of KAP (Table 1). The proportion of infantrymen (11.2%) with a good level of KAP was lower compared to other soldiers (28.1%),  $p < 0.001$  (Table 1).

#### 4. Discussion

This study was conducted at the Parakou garrison in Benin, with a sample of predominantly male soldiers, and with an average age of about 34 years. It showed that 33.5% of them had good knowledge and 66.9% right attitudes. No soldier surveyed had a good practice and only 17.3% had a good level of KAP. The level of KAP of the infantrymen was lower compared to the other soldiers.

The average age of soldiers is comparable to that found during a study in 2018 among Beninese soldiers on vaccination coverage against hepatitis B [10]. The male predominance reflects the reality of military world and is consistent with data from several other previous studies in Sub-Saharan Africa [6, 7, 11].

In this study, 63.5% of soldiers gave a good definition of hypertension; this result is close to that found in Ethiopian soldiers (66.7%) in a similar study in 2015 [7]. However, this observation is more satisfactory than that made during a study conducted in a peri-urban population in Ghana where only 49.8% of the adults surveyed were able to give a good definition of hypertension [12]. The main symptoms identified by the soldiers were dizziness and palpitations. These findings are consistent with the observations made during some studies in general population in Togo and Zimbabwe [13, 14]. The level of knowledge towards hypertension in this study was higher than that reported by Yayehd *et al.* during a survey conducted among civil servants in Lomé (Togo), in 2012, showing that no participant had a good level of knowledge [13]. It is also higher than that reported in another previous study among 451 adults in Limpopo in South Africa in 2017, where few participants had good (14.0%) knowledge of hypertension [15]. Regarding the military personnel, the average knowledge score was

estimated at 49.8% of correct answers during the study conducted among Ethiopian soldiers [7].

The proportion of right attitudes was different to that observed in the Ethiopian soldier's sample. Only 16.7% of these soldiers had a positive attitude towards hypertension [7].

Compared to our results, consumption of tobacco (60.0%) and alcohol (63.3%) were more frequent during the study among the Ethiopian soldiers while excessive salt consumption was less frequent (13.6%). Higher proportions for the consumption of tobacco (70.6%) and alcohol (51.2%) were also noted among Nigerian soldiers [6]. In general, soldiers adopt these behaviors to better cope with the difficult conditions in which they perform their duties. Although these behaviors are less prevalent among the soldiers in this study, continued awareness of their harmful effects is recommended. We found that 29.3% of the soldiers in this study had physical inactivity according to the World Health Organization standard. This prevalence is higher than that reported in the national "STEPS" survey on non-communicable disease risk factors in Benin in 2015 [16]. The practice of physical activity is supposed to be common among the soldiers because of the physical skills required in their professional field; those with physical inactivity may be in administrative positions. A higher prevalence of regular practice of physical activity was found in the study conducted among Ethiopian soldiers (90.6%) [6].

In the present study, most soldiers had not controlled their blood pressure during the year of the survey despite their facilitating environment. Indeed, there are a military hospital and a military health center in the city of Parakou where care is subsidized. This result may be linked to the lack of information on the asymptomatic nature of hypertension or to a lack of soldiers' availability. The function was associated with the level of KAP in this study. This may be related to an interaction between literacy level, function and KAP level. The infantrymen had a lower level of KAP probably due to a lower level of health literacy compared to soldiers performing other functions.

There are very few data available on the prevention of hypertension in soldiers. This study fills in the lack of information in this target group and will make it possible to set up adapted interventions for the fight against hypertension among soldiers in Benin, particularly in Parakou. Information biases related to insincere statements or poorly reported responses by interviewers are possible. However, these biases were minimized by the pre-test of the questionnaire, the training of interviewers, and the non-discriminatory nature of the information collected. Non-random sampling was conducted due to difficulties in obtaining a sample frame of soldiers. No military officers were included due to their unavailability. This does not allow the extrapolation of the results to all the soldiers in Parakou.

Further observational studies with a larger and more representative sample would be interesting to confirm the results. They could also provide data on hypertension prevalence. Studies testing interventions for prevention measures observance (such as awareness and screening campaigns, mobile applications, or peer education) will also be relevant.

## 5. Conclusion

This study shows that the level of knowledge about hypertension of the targeted soldiers was acceptable. Their attitudes towards hypertension were fair while their level of practice was low. Less than a fifth had a good level of KAP. Actions with the soldiers in Benin, particularly in Parakou, for better prevention of hypertension should be promoted. Further studies to confirm the data and to identify the most relevant f hypertension; this result is close to that found i

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