

Economic Stress, Precariousness and Risk of High Blood Pressure: A Descriptive Survey of Life Models within Households of the Central Region of Cameroon

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Abstract

Context/Objective: High blood pressure (HBP) currently represents the most widespread chronic non-communicable disease in Cameroon. The increase in its prevalence in the country is the result of multiple factors including economic stress imposed by precariousness, poor living conditions, sources of anxiety, anguish, depression and other behavioral disorders. Economic stress is a globalizing concept that integrates into a purely hermeneutic approach, a particular functioning of the nervous system of an individual who faces employment problems and precarious remuneration conditions. The non-satisfaction by an individual of his basic needs due to insufficient financial means can cause him to become irritable, aggressive, and socially and symbolically isolated, thereby increasing the desire to resort to morbid life models such as excessive consumption of narcotics and other psychoactive substances often associated with high blood pressure. The fight against the emergence of BPH is a complex, multifaceted and multifactorial reality that requires taking into account economic stress. The main objective of this survey is to describe the situation of economic stress within the Cameroonian population, which imposes precariousness and life models at risk of high blood pressure. Specifically, we determined the level of household income and the sources of income. **Methods:** A cross-sectional survey with a descriptive aim among five hundred house-

holds in the Central Region of Cameroon was conducted. A probabilistic technique called simple randomness was used. The number of households to be surveyed was determined indirectly using the Cochrane formula. Data collection in face-to-face mode using a physical questionnaire took place from July 1 to August 31, 2023, after obtaining ethical clearance from the Regional Health Research Ethics Committee, Human from the Center and an administrative authorization for data collection. Regarding their processing, the data was grouped during processing in Excel sheets. Normality and reliability tests of the collected data were carried out. For this, the Chi-square test was used for data with a qualitative value and that of Kolmogorov-Sminorf for data with a quantitative value. Descriptive analysis was possible using R software version 3.2, SPSS version 25.0, XLSTAT 2016, PAST and EXCEL programs from Microsoft Office 2013. **Results:** The main results highlight economic stress, with 45.60% of households surveyed earning less than US\$154 per month; 55% of household heads were women in single-parent families; 14% of household heads were unemployed, 22% worked in the private sector and 19% were self-employed. This general economic situation leads to precarious living conditions, thereby increasing the risk of high blood pressure among the Cameroonian population.

Keywords

Economic Stress, Precariousness, High Blood Pressure, Life Models, Households

1. Context and Objectives

Cameroon's economy is dominated by the primary sector. For this reason, in its National Development Strategy 2020-2030 (SND30), the country aims to: 1) reduce poverty to a socially acceptable level, 2) bring Cameroon to the rank of middle-income countries, and 3) reach the stage of a new industrialized country. The Cameroonian population therefore lives in extreme economic and social poverty. This precariousness is likely to have repercussions on the psychological and mental stability of the individual and lead to a chronic fluctuation in blood pressure figures. The HBP pathology today represents a real public health problem on a global scale. Indeed, it has affected nearly 1.13 billion people worldwide [1]. Several African countries are currently affected, and estimations are in favor of a more rapid increase in the proportion of people directly affected by the disease in the years to come [2]. Sub-Saharan Africa is a part of the world nowadays mostly affected where almost 24.90% of individuals are concerned compared to Southeast Asia and Australia (17.10%), South Asia (18.5%), Europe (21.00%), America (13.50%), North Africa and Middle East (15.80%) and global prevalence (16.50%) [3]. The increase in poverty in this part of the world, often considered the place where poverty reigns, may beyond anything be associated with the economic stress caused by the problems of youth unemployment and poor economic conditions. In most countries in this part of Africa, where precarious-

ness has taken up residence, the prevalence is important. The proportion of people affected is 22.3% in Malawi [4], average of 25.9% in Zambia [5], 24.6% of Kenyan were directly concerned [6], 34.5% in Angola [7], 20.4% in Ivory Coast [8] and 29.7% in Cameroon [9]. However, it seems important to emphasize that this progression of the phenomenon finds, beyond the universally known determinants, specific explanations for each country. The main factors associated with the occurrence of high blood pressure in young Togolese adults for example and classified in order of importance: psychological, socio-emotional, medical-nutritional, economic and cultural factors [10]. The main objective of our survey is to describe the situation of economic stress within the Cameroonian population, which imposes precariousness and life models at risk of high blood pressure. Specifically, 1) we determined sociodemographic characteristics usually known as exposure factors, 2) identified the level of household income, and 3) the sources of income. Through these specific objectives, economic stress within the Cameroonian population is highlighted based on the level of household income and the professional characteristics of the head of the household.

2. Materials and Methods

2.1. Study Design

This study was carried out in the Central Region of Cameroon. This choice is justified by the fact that: 1) it is the most populated region of the country, with average of 1,669,303 inhabitants. It houses approximately 18.67% of the Cameroon population; 2) as an administrative center, it experiences significant movements of populations in search of work opportunities. Given the fact that the central region is host to the economic capital of Cameroon, Yaoundé, it welcomes all the socio-cultural sensitivities of the country; 3) it is the Region with the largest number of households and probably the highest number of persons living with HBP (PLHBP) in the absence of new data on the general population census. To achieve our objective, a cross-sectional descriptive survey was carried out among five hundred households in the region. The study population consisted of households hosting at least one person living with High Blood Pressure (PLHBP). We chose households of PLHBP instead of households in the region because of the lack of recent data on this information. The last general population census took place in 2005 and the results were published in 2010. Another reason for the choice of household heads as the population of our study is that the latter represents the household, he then defines the general policy, is responsible for finding the resources necessary for the functioning of the household, thinks about its progress and future, he makes decisions that impact the household. Its economic situation significantly affects the living conditions of all the people who live under its roof. However, the PLHBP were identified in health facilities in the region, then it was easy for us to find their homes by a simple random selection.

We are aware of the fact that our approach may raise problems of selection bias and generalization of results. What should be remembered is the fact that exposure to economic stress affects all populations of Cameroon regardless of

the region with regard to the form of the State (hypercentralized), which defines economic policies and provides political orientations. The trickle-down of wealth and economic benefits occurs in the same way. Cameroonian populations move and live in the same context, sharing similar existential realities. Regarding the data collection, the period from July to August 2023, households chosen randomly and that agreed to participate in the survey has been investigated. Conversely, households whose consent was not obtained were put aside. For bias control, in order to be selected as a data collection agent, the candidate had to have experience of at least two participations in data collection activities in doctoral projects and/or surveys of national and/or regional scope; be a professional in the field of health or statistics with a minimum level of study equivalent to a Baccalaureate. The investigators then received one day of training with ourselves and two other public health experts. This training was to review data collection strategy and the field investigation procedure. Data were collected using a structured questionnaire addressed to the Head of Household of the PLHBP. The information sought was the socio-demographic characteristics (age, gender, marital status, household size) of the heads of households, professional occupation, monthly household income, sector of activity of the head of household and the different sources of income and additional income.

2.2. Sampling Technic

In order to guarantee the validity and reliability of our survey, a probabilistic technique has been used. We opted for an indirect sample. The selected heads of households had to host at least one PLHBP. It is therefore from the PLHBP identified in the health facilities that the heads of household were selected. However, the number of PVHTA was determined using the Cochran formula:

$$n' = \frac{\Sigma^2 pQ}{i^2} [11].$$

where n' represents the number of PLHBP (respectively number of households) to be surveyed; Σ : confidence threshold according to the reduced centered normal distribution (for a confidence threshold of 95%, $\Sigma = 1.96$); p : prevalence of hypertension in Cameroon, Q : $1 - P$ and i : desired precision (5%). Thus, our sample makes it possible to extrapolate the results with a 5% risk of being wrong by plus or minus 2%. After obtaining the number of PLHBP registered in the 1626 health facilities spread over thirty-two health districts of the central region, we carried out a simple random selection of households. Then, we interviewed a variable number of households in each health district, depending on the proportion of PLHBP recorded in these health facilities selected randomly. Finally, this resulted in a total sample size of five hundred households of PLHBP.

2.3. Data Collection Procedure

The data collection procedure concerns administrative and ethical issues. Our investigation took place in two stages. During the preparatory (step that corresponds first stage), we recruited and trained fifteen data collection agents on the methods of administering a questionnaire in a “face-to-face” and telephone call

mode. After this training, a selection test was organized, after which five data collection agents were selected. This stage permits us to obtain ethical clearance from the Center's Regional Committee for Ethics in Human Health Research (CRERSH), and administrative authorization for data collection. Before administering the data collection, our questionnaire was pre-tested in two phases: 1) it was submitted to our supervisor and our biostatistician for a critical analysis of content and form 2) then to fifty heads of households, in order to adapt the language level to the context of the respondents. The Southern Cameroon region served as the setting for this pilot study. Once in the field (second stage), each interviewer stated their identity and presented the data collection authorizations and the information notices. After obtaining the consent of the respondent, the administration of the questionnaire began immediately in "face-to-face" mode and lasted approximately 30 to 45 minutes. After then we proceeded for the validation of data by reviewing all the indicators. Questionnaires with missing data and outliers were left aside.

2.4. Statistical Methods

The purpose of our data analysis was not to emphasize on statistical associations among variables, but to highlight the exposure factors. Firstly, the results were presented either in the form of graphs, frequencies or percentages. These graphs and tables present the categories of variables and the corresponding numerical data, and characteristics of their distributions for both quantitative and qualitative data. This was done using the Microsoft Office 2016, EXCEL program.

2.5. Normality and Reliability Tests

The Chi-square test was used for data with a qualitative value and that of Kolmogorov-Sminorf for data with a quantitative value.

2.6. Descriptive Analytics

Descriptive analysis made it possible to synthesize and prioritize the data and detect the characteristic parameters of each data variation. It also makes it possible to check whether the variations are due to chance, to the collection tools or whether these variations are significant and to compare the variation and significance thresholds to better assess the results obtained. This analysis was possible thanks to the XLSTAT 2016 software.

3. Results

3.1. Head of Household Sociodemographic Characteristics

The sociodemographic characteristics of the heads of households made it possible to judge the age at which exposure to economic stress began, as well as employment issues and work force. Several scientific studies have highlighted the existence of a positive association between certain sociodemographic characteristics (age, gender, marital status) and the risk of developing high blood pres-

sure. The results of our research aim to expose the existence of exposure with regard to general living conditions in households. Regarding the characteristics of the Heads of household (HH) interviewed (**Table 1**), we observed that the median age of heads of household (HH) was 47.37 (± 11.20) years. The age of these HH was between 19 and 75 years old, divided into seven classes of equal amplitude. 1.80% of them were already head of households at 19 years old. HH aged between 35 and 43 were the most numerous, with a proportion of 28.8%. Regarding the gender of HH (**Table 2**), our respondents were made up of 275 women (55.00%) and 225 men (45.00%), with a femininity ratio (female/male) of 1.22. These households are led mainly by married/free union parents (53%), single-parent families (13%), predominantly female, where the woman assumes sovereign functions and participates in the survival of the members. For the level of instruction, 33.00% of our HH arrived at the secondary school, while 30.80% of them did not attend this level. 43.00% of the households interviewed were located in rural areas. On the other hand, 65% of households visited house between 3 and 6 people (**Figure 1**). The family size gives the information on the level of commitment of the HH to satisfy needs of the member with a certain revenue.

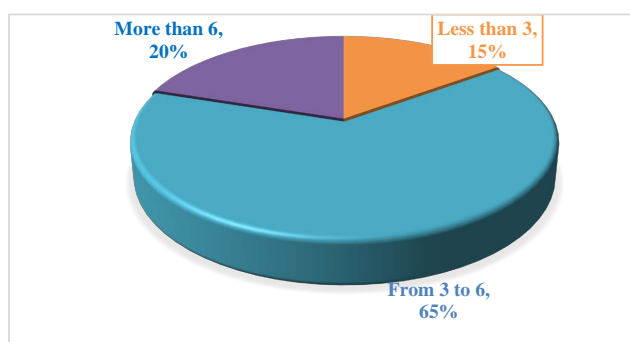


Figure 1. Family size.

Table 1. Central tendency and dispersion parameters.

Characteristics	N = 500
Age group	
19 - 27	9 (1.80%)
27 - 35	50 (10.00%)
35 - 43	144 (28.80%)
43 - 51	120 (24.00%)
51 - 59	71 (14.20%)
59 - 67	95 (19.00%)
67 - 75	11 (2.20%)
Minimum	19 years
Maximum	75 years
Average age	47.37 years
Standard deviation	11.20

Table 2. Characteristics of households interviewed.

Characteristics	N = 500
Gender	
Male	225 (45.00%)
Female	275 (55.00%)
Matrimonial status	
Married/free union	265 (53.00%)
Sigles	65(13.00%)
Widower	35 (7.00%)
Undeclared	135 (27.00%)
Residence location	
Rural	215 (43.00%)
Periurban	195 (39.00%)
Urban	90 (18.00%)
Educational level	
No level	25 (5.00%)
Primary	154 (30.80%)
Secondary	165 (33.00%)
University	156 (31.20%)

3.2. Socioeconomic Characteristics

As far as socioeconomic characteristics are concerned, the results show that 23.00% of heads of households work in the state civil service, and 22.00% in the private sector, while 41.00% are either engaged in other activities (employer, agriculture, etc.), retired (5.00%) or unemployed (14.00%) (**Table 3**). Regarding monthly incomes (**Figure 2**), we noted that 45.60% of HH earn less than 154 dollars monthly. They therefore live below the monetary poverty line. That is the reason why 42.76% of households rely on help from their friends and acquaintances to meet the needs of their families (**Figure 3**). Aid is a one-off and unstable action which does not offer a guarantee of perpetuity

Table 3. Professional occupation of heads of households.

Profession	Number (n)	Percentage (%)
Unemployed	68	14
Civil servant	113	23
Employer	13	2
Private civil servant	108	22
Retirees	28	5
agricultural sector	30	6
Self-employed	93	19
Workers under the flag	43	9
Total	500	100

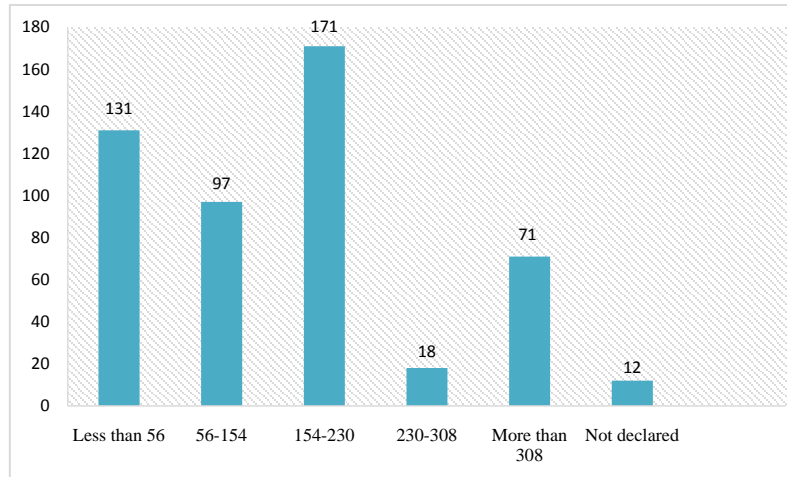


Figure 2. Distribution of head of households monthly revenues in US dollars.

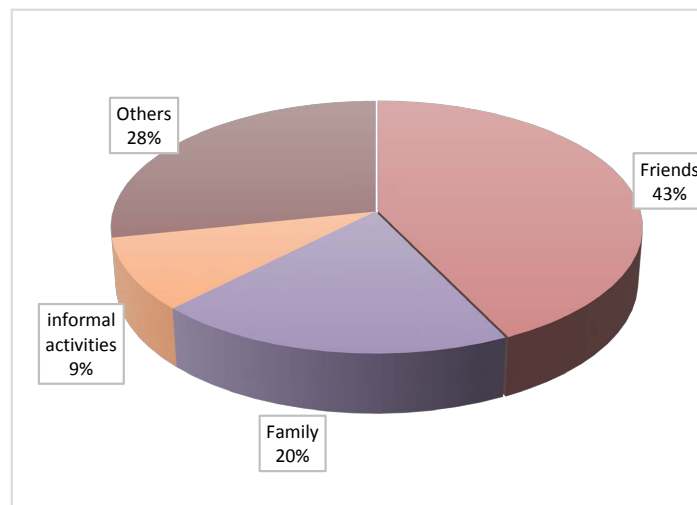


Figure 3. Unstable source of subsidies for household needs.

4. Discussion

Economic stress is a set of physiological manifestations resulting from precarious economic conditions, which affect the process of satisfying the morning needs of life, as well as that of self-realization. This stress is the consequence of poor working conditions, unemployment, underemployment, poor remuneration conditions, and the absence of distributive justice. This state of affairs creates large-scale intrapsychic tensions within the individual. This is followed by a significant secretion of psychoactive substances harmful to the cardiovascular system. Several factors are particularly included in the itinerary of guilt. The phenomenon is no longer limited only to the elderly, it is increasingly present among young adults. Exposure begins very early following a failure to adapt to life situations.

The results of our study showed that 40.6% of heads of households are aged less than 45 years old. At this age, they experience the harsh reality of making

decisions that impact the future of the family. These decisions are only important if these leaders are able to satisfy the needs of the household. However, current unemployment has led to a limitation of resources to fully play this role, which causes the tensions of lack at this age and exposure to high blood pressure. In terms of sociodemographic characteristics, the majority of our household heads were women. They are responsible for single-parent families in which they assume both the functions assigned to men and their own functions. If the situation has to be coupled with the scarcity of employment, this is likely to create additional stress. Marital status “Married/common law” has been associated with high blood pressure in the Democratic Republic of the Congo [12]. While it is true that men are at greater risk of developing cardiovascular and kidney diseases than premenopausal women of the same age [13], it is also true that this risk is significant among single women experiencing existential stress and economic origin. The strong presence of HBP among the Cameroonian population could be explained by the economic stress to which they are victims, coupled with psychological and monetary insecurity. Indeed, a positive relationship between poor mental health and unemployment was found among participants in a study whose objective was to assess the association between unemployment, major cardiovascular risk factors and mental health [14]. Another study showed that the risk of cardiovascular events and all-cause mortality were high among the unemployed compared to the workers [15]. The combined rate of underemployment linked to working time and unemployment is estimated at around 23.0% among people aged over 14, with an unemployment rate as defined by the International Labor Office is high in the two largest cities of Cameroon such as Douala (15.40%) and Yaoundé (11.70%), for a national average of 9.40% [16]. These data are close to the results of our household survey, *i.e.* approximately 14.00% of heads of households are unemployed. The problem of unemployment is an important existential question. It constitutes a socio-economic determinant of chronic non-communicable diseases (NCDs), not only because of the psycho-affective consequences that it is likely to generate, but above all, it can prevent people from having lifestyles favorable to health through the mechanism of chronic deficiency. The strong emotions caused by the situation of poverty can lead to psycho-affective disorders. The physiopathological mechanism involves the secretion of psychoactive substances (hydrochloric acid, adrenaline) responsible for the fluctuation of blood pressure figures. Alongside unemployment, there are working conditions considered precarious. Most of the Cameroonian population works in the informal sector which has the particularity of being poorly structured and does not guarantee lasting security. These informal activities also take place in the context of material insecurity. Analysis of the situation in informal production units (UPIs) throughout the country shows that only 9.20% of them have premises that operate without running water (89.20%), without electricity (41.70%) and without means of communication (telephone) (83.40%). The salary rate (ratio of the number of employees to the total number of workers) in these UPIs is estimated at 5.80% [17]. Indeed, stress

has several origins and its consequences can be counterproductive for individuals. In certain circumstances, it reflects a normal reaction of the body, but in other, it can be oxidative and cause fluctuation in blood pressure figures. The Cameroonian population faces a high gradient of economic stress. One of the determinants of this state of affairs is the general economic situation of the country that leads to psychological exposure. A survey conducted in a community-based cohort of blacks, shows that chronic psychological stress has been associated with an increased risk of developing hypertension [18]. Poor pay and working conditions lead to psychological problems and the secretion of stress hormones such as adrenaline that increase blood volume. Some studies discovered a significant correlation between work stress and hypertension [19]. All this shows that the Cameroonian citizen lives in permanent stress with the only certainty being the uncertainty of tomorrow. This is a population that is not able to satisfy its basic needs and therefore maintain lasting health. 45.60% of heads of households surveyed have incomes of less than US\$154 per month. This context imposes stress, especially as it has to deal with galloping inflation. The inflation rate between October 2022 and October 2023 is around 7.70%, thus exceeding the threshold of 3% set by CEMAC. This inflation is justified by an increase of 12.30% in the prices of food products, 12.60% in transport costs and 8.10% in the prices of furniture, household items and routine maintenance products [20]. Cameroonian households face persistent and regular inflationary pressures, while the problem of unemployment and under-paying continues to persist. Those responsible for these households are thus victims of chronic economic stress, a source of oxidative stress responsible for high blood pressure.

5. Conclusion

Our survey of households in the Central Region of Cameroon highlights the existence of economic stress and precariousness. Heads of households who experience, at varying intensities, the hardships imposed by unemployment, precarious working conditions defying classic ergonomic rules, underutilization of labor (inadequacies between supply and demand for labor which translates into an unmet need for employment in the population), live in generalized insecurity with regard to the importance of remunerative work in satisfying the morning needs of life. This insecurity is materialized by the risk of occurrence of MCNT, which HBP is the worthy representative. Economic stress therefore constitutes a modifiable risk factor for hypertensive pathology. Precarious working conditions can trigger economic stress, consequently leading to the secretion of psychoactive substances often involved in the chronic fluctuation of blood pressure levels. It seems clear that poor working conditions are likely to contradict the mechanisms of self-realization and social advancement in individuals and families. Consequently, the fight against high blood pressure must follow the contours of a collaborative “One Health” approach. This intersectoral collaboration takes into account all exposure factors, in this case, economic factors. Good financial income leads to emotional and psychological stability among heads of households

called upon to meet the needs of the family. This tranquility on an emotional and psychological level therefore leads to the reduction of nervous and intrapsychic tensions associated with the secretion of psychoactive substances. The fight against the progression of high blood pressure in Cameroon and by extension in most developing countries is due to the economic situation and the dynamics of prosperity. Future studies should therefore examine the statistical links between economic stress and the epidemic of high blood pressure in a broader context.

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Compliance with Ethical Standards

Before collecting data in households, we obtained the administrative authorization from the regional delegation of public health of the center, and the ethical clearance from the Regional Committee on Research Ethics for Human Health of the Center. To ensure the confidentiality and autonomy of participants, they had been asked to sign a free and informed consent form. The respect for vulnerable people was demonstrated by the non-inclusion of individuals with emotional instability, and psychologically disturbed people. The respect for privacy and personal data has been ensured. In fact, people were identified by alphanumeric codes and not by their names.

Authors' Contributions

Jean NDIBI ABANDA, Désiré TCHOFFO, Anicet ONANA AKOA, Viviane FOSSOUO NDOUNGUE, Ulrich DAMA, Arsène Emilien MESSI NDZENGUE, Melkior FOBASSO DZEUTA and Alphonse TEDONGE ASOBOCHIA designed the study. Jean NDIBI ABANDA and Désiré TCHOFFO analyzed the data and produced the first draft of the study. All authors extracted the manuscript and approved the final draft.

Conflicts of Interest

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

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