Scientific Research Publishing

World Journal of Cardiovascular Diseases, 2024, 14, 603-611
https://www.scirp.org/journal/wjcd
ISSN Online: 2164-5337
ISSN Print: 2164-5329

Prevalence of Cardiovascular Risk Factors and Heart Diseases within the Urban and Rural Communities of the Town of Bougouni and Its Surroundings (Southern Mali): A Comparative Study

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How to cite this paper: Sogodogo, A., Dakouo, R.M., Camara, H., Traore, L., Coulibaly, A., Ba, H.O., Sidibé, N., Sangaré, I., Diarra, B. and Menta, I. (2024) Prevalence of Cardiovascular Risk Factors and Heart Diseases within the Urban and Rural Communities of the Town of Bougouni and Its Surroundings (Southern Mali): A Comparative Study. *World Journal of Cardiovascular Diseases*, **14**, 603-611.
https://doi.org/10.4236/wjcd.2024.149052

Received: June 26, 2024
Accepted: September 23, 2024
Published: September 26, 2024

Abstract

In Mali, few studies have been conducted on the prevalence of cardiovascular risk factors and diseases according to place of residence. The aim of this study was to assess the prevalence of risk factors and cardiovascular diseases according to residents in town of Bougouni and its rural area (southern Mali). **Methods:** This was a retrospective descriptive study from February 2019 to March 2024. All patients who visited the "CENTRE MEDICAL DE BOUGOUNI" clinic with known or suspected heart disease during the study period were included. Data were collected from medical records. Incomplete or unusable records were excluded. Data were processed using SPS version 22 software. **Results:** we included 452 patients with an average age of 50 ± 19 years. High blood pression has been found in 42.70% of cases, with higher prevalence in urban areas (47.01%) than in rural areas (41.50%). Diabetes and smoking were found respectively 5.31% and 8.19% in our population. The prevalence of diabetes was higher in urban areas (5.97%) than rural area (5.35%). smoking prevalence was higher in rural areas (8.49%) than urban areas (6.72%). Alcoholism was found in 2.21% of cases with a little difference between rural area (2.24%) and urban area (2.20%). 31.63% of our patients had no cardiovascular factor. Dyspnea was the reason of consultation in 5.75% of cases and atypical precordialgia in 13.72%. Headaches and dizziness in 8.63% of cases and 21.90% of patients presented other non-specific symptoms. Diagnosis of idiopathic dilated cardiomyopathy was found in 23.45% of cases with higher

prevalence in rural areas (28.30%) than urban areas (13.43%). Ischaemic heart disease accounted for 9.29% of cases with a higher prevalence in rural areas (10.38%) than in urban areas (6.71%). PPCMs accounted for 5.98% of cases, with a slight increase in urban areas (6.66%) compared with rural areas (5.68%). Rheumatic valvulopathy accounted for 2.21% of cases; 2.84% in rural areas and 0.74% in urban areas. Other valvular diseases accounted for 3.76% of cases; 4.73% in rural areas and 1.48% in urban areas. Right heart diseases accounted for 3.98% of cases and stroke for 1.77%. **Conclusion:** The prevalence of cardiovascular risk factors and heart diseases is high in the rural and urban population of the town of Bougouni and its surroundings (Mali). Excepted smoking, the prevalence of other CV risk factors is higher in urban areas, whereas the prevalence of idiopathic dilated cardiomyopathy and ischemic heart disease is higher in rural areas. These data could serve as a basis for developing tailored preventive strategies, depending on the place of residence.

Keywords

Prevalence, Cardiovascular Risk Factors, Cardiovascular Diseases, Rural and Urban Areas, Bougouni-Mali

1. Introduction

Cardiovascular diseases represent a major public health problem worldwide [1].

Despite a downward trend in developed countries, the situation is worrying in emerging countries [2].

They rank first among non-communicable diseases in Algeria [2] with a high prevalence of cardiovascular risk factors among young people and rural populations [3].

Cardiovascular risk factors have been established for several decades and are becoming increasingly prevalent with a significant amount of data in the world in Africa [4].

In Mali, little data is available on the prevalence of risk factors and cardiovascular diseases depending on the area of residence.

In Mali, traditional cardiovascular risk like hypertension, diabetes, smoking and obesity have been published [5]. In addition, data from extra-hospital population studies are rare or old [6].

We initiated this work and our main objective was to assess the prevalence and create an epidemiological profile of CVD and CVRF within the rural and urban communities of the town of Bougouni and its surroundings (Mali).

Methods: We carried out a cross-sectional, descriptive study with retrospective collection of data from patients followed at the Bougouni Medical Center, between February 2, 2019 and March 31, 2024. All patients with symptoms suggestive of cardiovascular disease, with or without a known cardiovascular antecedent have been included. The aim was to assess the prevalence of common

cardiovascular risk factors and cardiovascular diseases and to determine their profile in rural and urban areas. Data were collected from medical records. Incomplete files were excluded. The data collected on a survey sheet were entered and analyzed by the SPSS version 22 software.

2. Results

Sociodemographic data:

In this study, which involved 452 patients, the average age of the patients was 50 ± 19 years with a minimum of 1 year and a maximum of 90 years. Those over 60 represented 34.74% of cases (157 cases) and 33.18% (150 cases) were 40 or older. 267 cases (59.08%) were female and 185 (40.92%) were male; the sex ratio at 1.19 in favor of women. 70.35% of patients were living in rural areas (318 cases); 29.65% in urban areas (134 cases) and 64.82% were doing agropastoral activity (Table 1).

Table 1. Characteristics of subjects who consulted the cardiology department.

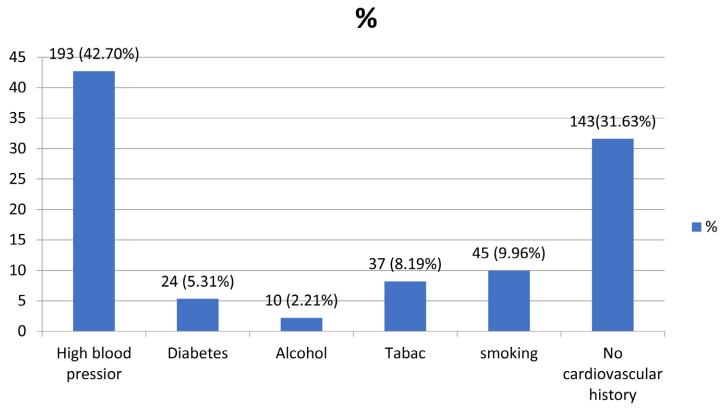
Characteristics	Number (N = 452)	Percentage (%)
Sex		
F	**267**	**59.08**
M	185	40.92
Age (years)		
1 - 20	36	7.96
21 - 40	114	25.22
41 - 60	145	32.08
More than 60	157	34.70
Résidence		
Rurale	318	70.35
urbaine	134	29.65
Occupation		
Agro-pastoral	293	64.82
Office worker	23	5.09
other	136	30.09

Risk factors:

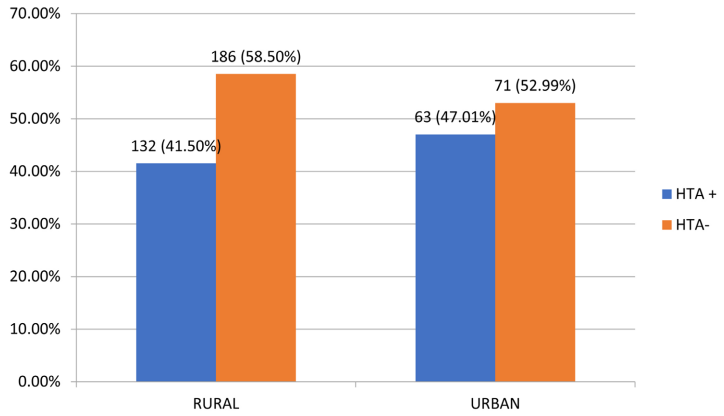
A history of hypertension was found in 42.70% of patients (193 cases) (Graph 1), this prevalence is higher in urban areas (47.01%) than in rural areas (41.50%) (Graph 2). Diabetes and smoking had a respective prevalence of 5.31% (24 cases) and 8.19% (37 cases) in our population (Graph 1) without a significant difference according to residence, with 5.97% in urban areas compared to 5.35% in rural areas (Graph 3). Active smoking was found in 8.49% of rural people compared to 6.72% of urban ones (Graph 4).

Regular alcohol consumption was found in 10 patients (2.21% of cases) (Graph 1) and the difference was not significant between the rural area and the urban area: Respectively (2.20%) and (2.24%) (Graph 5).

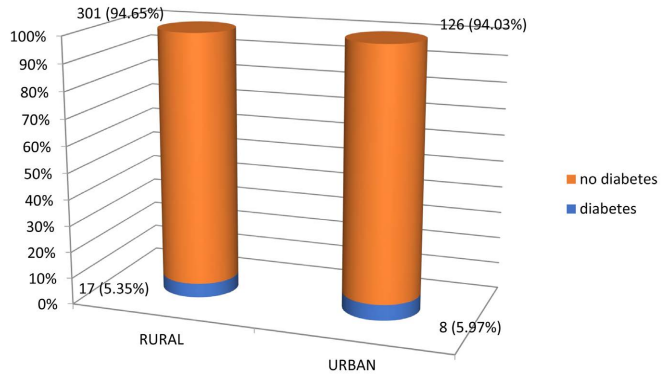
143 patients (31.63% of cases) had not any history nor cardiovascular risk factors (Graph 1).



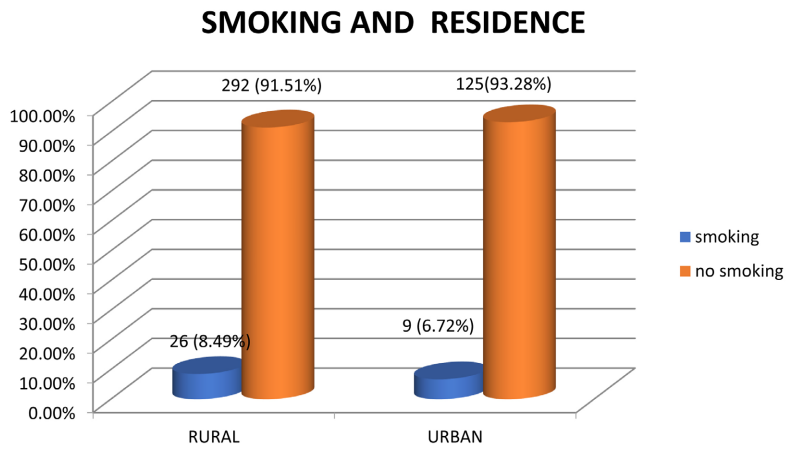
Graph 1. Distribution of patients according to known cardiovascular history and risk factors.



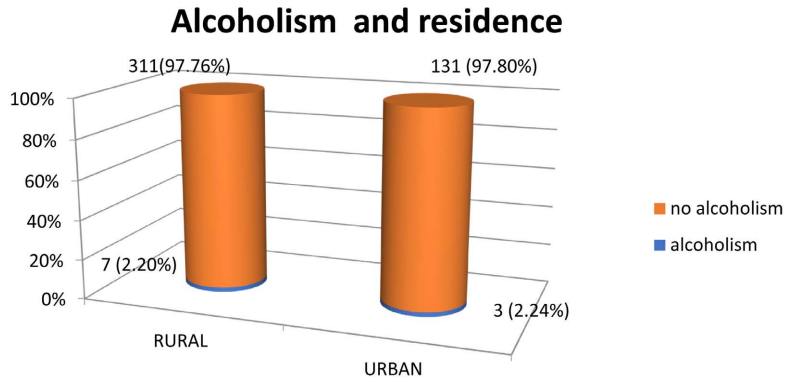
Graph 2. Proportion of hypertension according to residence.



Graph 3. Proportion of diabetic patients according to residence. The proportion of known diabetic subjects is slightly higher in urban areas (5.97%) than in rural areas (5.35%).



Graph 4. Proportion of diabetic patients according to residence. The proportion of known diabetic subjects is slightly higher in urban areas (5.97%) than in rural areas (5.35%).



Graph 5. Proportion of alcoholism according to residence. The prevalence of alcoholism was not significantly different between rural and urban areas: (2.20%) in rural areas versus (2.24%) in urban areas.

The reason for consultation:

The main reason for consultation was dyspnea.

252 patients (55.75% of cases) presented dyspnea of different stages, 62 patients (13.72%) came for atypical chest pain, 39 patients (8.63%) for headaches or dizziness and 99 patients (21.90%) presented other symptoms pointing towards other types of pathologies (Table 2).

Table 2. Distribution of patients according to reason for consultation.

	N	%
DYSPNEA	252	55.75
OTHER	99	21.90
HEADACHE OR DIZZINESS	39	8.63
PRECORDIALGIA	62	13.72
TOTAL	452	100

Dyspnea was the most reason of consultation, with 55.75% of cases.

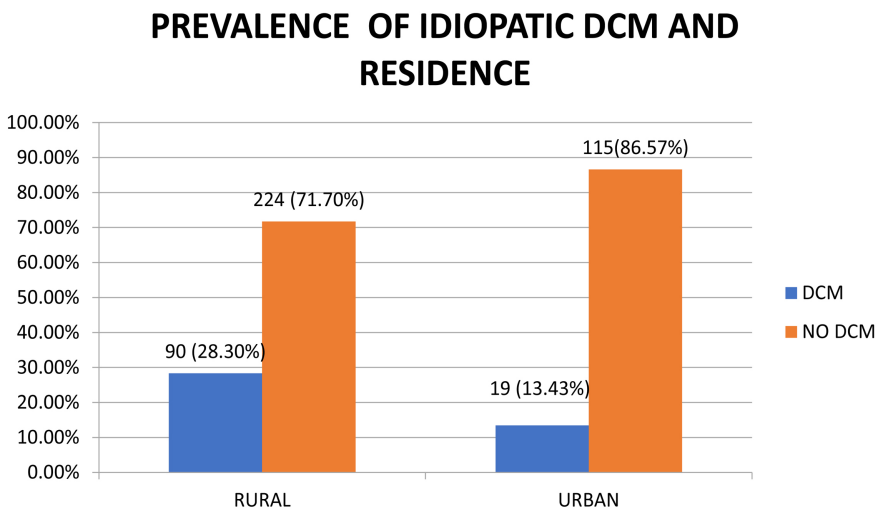
The retained diagnosis:

Idiopathic dilated cardiomyopathy represented 23.45% (Table 3). And this prevalence was higher in rural areas (28.30%) than in urban areas (13.43%) (Graph 6). Uncomplicated hypertension was found in 102 patients (22.58% of cases).

Table 3. Distribution of patients according to the retained diagnosis.

RETAINED DIAGNOSIS	N	%
Hypertension	102	22.58%
Idiopathic DCM	106	23.45%
PPCM	27	5.98%
Rheumatic valve diseases	10	2.21%
Other valvular diseases	17	3.76%
Ischemic heart disease	42	9.29%
CPH	18	3.98%
Congenital heart diseases	10	2.21
Pericarditis	12	2.65
Stroke	8	1.77
Other pathology	100	22.12
Total	452	100%

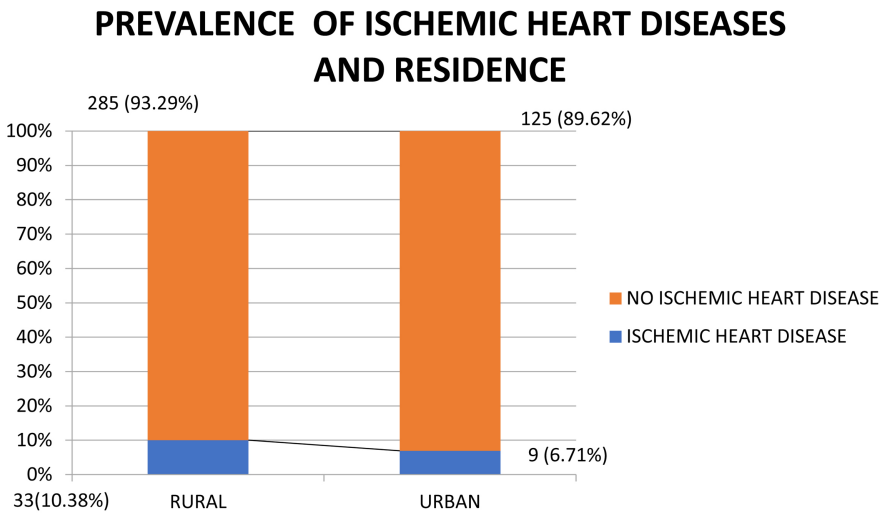
An idiopathic DCM was retained in 23.45% of patients.



Graph 6. Proportion of idiopathic DCM according to residence. The prevalence of idiopathic DCM was higher in rural areas (28.30%) than in urban areas (13.43%).

30.37% of urban people were affected compared to 19.24% in rural areas. Ischemic heart disease was found in 42 patients (9.29% of cases). This prevalence is higher in rural areas (10.38%) than in urban areas (6.71%) (Graph 7). Postpartum heart disease represented 5.98% in our study: 5.68% among rural resi-

dents compared to 6.66% among patients residing in towns. Rheumatic valve diseases at 2.21%; other valvular diseases at 3.76%; with 2.84% in rural areas compared to 0.74% in urban areas. Chronic pulmonary heart at 3.98%. a stroke was found in 1.77% in our series; no significant difference between rural (1.89%) and urban (1.48%) areas. 100 patients (22.12% of cases) did not present cardiovascular pathologies (Table 3).



Graph 7. Proportion of ischemic heart disease according to residence. The prevalence of ischemic heart disease was higher in rural areas (10.38%) than in urban areas (6.71%).

3. Discussion

This study may contain some bias because of the retrospective data collection and this a preliminary study that could guide future studies on epidemiological transition in rural areas in Africa.

We have included 452 patients in our study. Among them, 318 (70.35%) lived in rural areas and 134 (29.65%) in urban areas. 64.82% were farmers or breeders. This can be explained by the fact that the majority of our patients lived in rural areas. Our population was different to M. Brouri's *et al.* in Algeria, most of whom lived in city (287 cases) compared to 124 patients from rural areas [2]. 59.08% of our population were women (318 women) and 40.92% were men (185 patients); this is close to M. Brouri finding with 262 women and 148 men [2] and A. Mbaye's in Dakar, Senegal with 1052 women of 1411 cases [7]. The average age was 50.19 years; 34.74 of the patients were over 60 years old and 7.96% were 20 years old or less. 57.30% of consulting patients were aged 21 to 60 years. (Table 1). a little different from the A Mbaye's finding in Senegal with an average age of 48.5 ± 12.68 years [7]. Most patients complained of dyspnea (55.75%); 13.70% for atypical chest pain and 8.63% for headache or dizziness (Table 2). This can be explained by the fact that, in general, rural populations in Africa haven't easy access to health services, so they only go to the doctor when it's serious. 42.70% of our patients had a known history of hypertension; these results are higher than the prevalence in sub-Saharan Africa (31%) [1] and Salimanou et

al's finding (31.8%) [1]; Brouini's finding (39%) [2]. It was higher in urban areas (47.01%) than in rural areas (41.50%). Our results were close to those of Boulki in Algeria with 28% in urban areas and 16.8% in rural areas [3], and BA HO in Bamako: 24.7% in urban areas and 21.10% in rural areas [8]. Our results differ from those of FOURCAGE, which reported almost similar in rural areas (30% to 40%) than in urban areas (40%) but for a population over 60 years old only [9].

Diabetes was found in 5.31%, our data are lower than the prevalence in the general population in sub-Saharan Africa (8%) [1] and the finding of Brouni in Algeria (25%) [2], we did not observe a significant difference between the rural area (5.35%) and the urban area (5.97%), this is different from the results of BOULKI in Algeria which had a higher prevalence in urban areas (28%) than in rural areas (24.8%) [3].

Active smoking was found in 8.10% of our patients; lower than the overall prevalence in sub-Saharan Africa (12%) and the results of Salimanou in Benin (12.4%) [1]; this prevalence was slightly higher in rural areas (8.49%) than in urban areas (6.72%). Our results were close to those of Boulki in Algeria who did not observe a significant difference between rural and urban areas [3].

Regular alcohol having was found in 2.21% of the cases; lower than the general prevalence in sub-Saharan Africa (21%), This prevalence is also lower than the results from Salimanou in Benin (8%) [1] we didn't observe a significant difference between rural population (2.20%) and urban one (2.24%). 31.63% of our population had no known cardiovascular risk factors; this was different to Brouni's finding in Algeria, 91% of patients had at least 1 cardiovascular risk factor [2].

Idiopathic dilated cardiomyopathy (DCM) accounted for 23.45% of cases in our study; that's less than the results of EDGAR WENDPANGA in Burkina Faso (84.4%); this difference can be explained by the fact that he has included only patients with heart failure in this study [10]. The prevalence of DCM was higher in rural areas (28.30%) compared to 13.43% in urban areas. This could be explained by the fact of rural population don't have easy access to the doctor in Mali. Ischemic heart disease accounted for 9.29% of cases, this was less than the results of El Ghazi in Morocco (30.60%) [11]. The proportion of ischemic heart disease was higher in rural areas (10.38%) compared to urban areas (6.71%). Rheumatic valve disease accounted for 2.21% of cases; the same thing for heart disease (2.21%).

4. Conclusion

This study highlighted a high prevalence of risk factors and cardiovascular diseases in the rural and urban population of Bougouni and its surroundings (Mali). However, the prevalence of some risk factors such as hypertension, diabetes, smoking and alcoholism is higher in urban areas than in rural areas. On the other hand, idiopathic dilated heart disease, ischemic heart disease and smoking have a higher prevalence in rural areas. These data could provide a basis for developing cardiovascular disease prevention strategies based on place of residence.

Conflicts of Interest

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

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