

*Country Data*

**A Preliminary Survey of Un-diagnosed Hypertension among Nubians and Coptics in Atbara and Eldamer Cities, Sudan: Does Ethnicity Affect Prevalence?**

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**Abstract**

**Introduction:** Hypertension is a non-communicable disease of increasing importance in developing countries. Due to its silent nature and serious complications, active screening is essential in case detection. The aim of this study was to determine the prevalence of undiagnosed hypertension and to find out whether there are ethnic variations in prevalence between two Sudanese ethnicities.

**Methods:** This is a cross-sectional community-based study in which 100 subjects from Nuba tribe and 70 Coptics not previously known to have hypertension volunteered to participate. Blood pressure was measured and a questionnaire delineating demographic, clinical and social data was obtained from each participant.

**Results:** Female to male ratio was 2:1. The mean age was 39.5±8 years for Nubians and 40.5±5.5 years for Coptics. High blood pressure was detected in 48% of Nubians and 24.3% of Coptics ( $p<0.001$ ). The prevalence of stage II hypertension was higher in Nubians compared to Coptics (25% vs. 3.8%;  $p<0.001$ ). Besides the ethnic variation, other significant differences between the two groups were illiteracy and alcohol consumption, both of which were significantly commoner among Nubians.

**Conclusion:** Undiagnosed high blood pressure is common in our local community, with some variations in prevalence and severity among different ethnic groups.

**Key words:** Coptics; Nubians; River Nile State; Sudan; Undiagnosed hypertension

*The authors declared no conflict of interest*

**Introduction**

Hypertension is a rising health problem worldwide and an emerging non-communicable disease in developing countries. In Sudan, as in many other developing countries, hypertension is increasing in prevalence [1-3], but the presence of many undiagnosed cases masks the real prevalence of the disease [1]. Therefore, effective screening is essential to reduce subsequent complications.

Risk factors for hypertension include age, gender, family history of hypertension, overweight, lack of physical activity, increased dietary sodium and stress. Ethnic variations are considered independent risk factor for hypertension and its complications [4].

The aim of this study was to determine the prevalence of un-diagnosed hypertension in two different ethnic groups (Nubians and Coptics) living in the same state in Sudan, and to find out whether ethnic variation affects this prevalence. These two ethnic groups were selected due to their distinct ethnic features and because they tend not to mix with other ethnic groups in the local community. Nubians are native Sudanese with black skin whereas Coptics descend from Egyptian ancestors and they have fair skin. Therefore, they constitute suitable groups to study the possible effect of ethnic variation on hypertension prevalence.

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## Methods

This descriptive cross-sectional community based study was conducted at Atbara and Eldamer towns, River Nile State, Sudan in July 2009. One hundred and seventy participants were recruited from Nuba (n=100) and Coptic (n=70) ethnic groups. Coptic and Nubian participants were invited to participate in this study during a house-to-house survey in Atbara (Elsikka Hadeed and Elfaki Madani districts) and Eldamer (Dar Elsalam district) cities, respectively.

Adults aged 18 years and above who were not previously known to have hypertension were included. Blood pressure was measured in the sitting position using a mercury sphygmomanometer with appropriate cuff size. The average of three readings each taken after 5-minutes rest was recorded. Blood pressure levels were classified according to the criteria of The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure [5]. Demographic data and risk factors were also documented. Statistical analysis was done by SPSS version 13.

Informed consent was obtained from each participant. All individuals found to have a high blood pressure or any other medical condition were referred, according to their will, to a physician for further management. An ethical clearance of the research was obtained from the Ethical Committee of the Faculty of Medicine, Nile Valley University.

## Results

Demographic characteristics of the study population and risk factors for hypertension are shown in table-1. The mean age was 40.5±5.5 years for Coptics, and 39.5±8 years for Nubians, and the mean weight was 69.3±12.3 and 67.1±10.7 kilograms for Coptics and Nubians respectively. The educational level was higher in Coptics, 57% having obtained a college degree whereas 70% of Nubians were illiterate (p<0.001). There was high alcohol consumption and cigarette smoking among Nubians compared to Coptics (74% vs. 11.4%; p<0.001). Family history of hypertension was prevalent in both groups.

Hypertension was diagnosed in 48% of Nubians and 24.3% of Coptics (p<0.001). Table-2 displays the classification of blood pressure among the study population. Prevalence of stage II hypertension was 25% among Nubians and 3.8 among Coptics (p<0.001).

**Table-1: Frequency distribution of study group characteristics and risk factors**

Variable	Coptics (n=70)	Nubians (n=100)
Age groups		
20-35	52.9%	49%
36-50	21.4%	20%
51-65	20.0%	21%
≥ 65	5.7%	10%
Male/Female	46%/54%	25%/75%
Education		
Illiterate	0%	70%
Primary school	5.7%	5%
Secondary school	37.1%	18%
College and above	57.1%	7%
Smoking or alcohol consumption	11.4%	74%
Family history of hypertension	38.6%	36%

**Table-2 Classification of blood pressure among the two study groups.**

Category	Coptics (n=70)	Nubians (n=100)
Normal	22.9%	12%
Pre-hypertension	52.9%	40%
Stage I hypertension	20.0%	23%
Stage II hypertension	3.8%	25%

Normal: BP < 120/80 mmHg; Pre-hypertension: BP = 120 – 139 / 80-89 mmHg; Stage I hypertension: BP = 140 – 159 / 90 -99 mmHg; Stage II hypertension: BP ≥160 / 100 mmHg

## Discussion

The findings of this study indicate the high prevalence of un-diagnosed hypertension among participants (38.2%). This finding is comparable to that reported from Tunisia (30.6%), Jordan (32.2%) and Zambia (34.8%) [6-8]. Among US African Americans the prevalence of hypertension was reported at 40% compared to 27% among Americans of European descent [9, 10].

The high prevalence of undiagnosed hypertension in our study group may be attributed to the increasing life stress, dietary factors or to the genetic makeup of individuals [11]. It could also be related to high illiteracy rate, low socioeconomic status, poor health education,

and decreased awareness of diseases leading to delay of seeking medical advice among participants. Another risk factor may be alcohol consumption and smoking which were commoner among Nubians. However, ethnic variations and genetic factors might play a major role as demonstrated by similar studies [2-4].

This study urges the active screening of hypertension and other non communicable diseases in the community so as to reduce the risk of late presentation and complications; specially cardiac, renal and cerebrovascular events. It is assumed that the cost of active screening would be far less than managing complications [12] in an already burdened health system. Certain ethnicities in our community may require a special attention to certain health risks e.g. high blood pressure among Nubians.

Limitations of the study include the study design itself, since a cross sectional study with limited sample size does not represent the total population; therefore generalization of results may not be appropriate. The matching of the two groups was another issue of concern as participation was on voluntary basis. Finally, data about dietary habits, physical activity, and biomarker data were lacking, all of which are relevant to hypertension etiology. Despite these limitations, the findings of this study may be used as a basis for further screening studies with a larger sample size, better matching of participants, multi-staging as well as genetic studies.

## Conclusion

This study sheds light on the high prevalence of un-diagnosed hypertension in our community with some variations in prevalence and severity among different ethnicities in Sudan.

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