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Awareness of Risk Factors and Complications of Hypertension in Southern Tanzania

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ABSTRACT

Introduction: To assess patients' awareness on the risk factors, complications and prevention of complications of hypertension.
Methods: This cross-sectional study was carried out on a non-random sample of hypertensive patients attending Songea Regional Referral Hospital, Tanzania using an interview based questionnaire. Data entry and analysis were performed using SPSS v.14. Results are expressed as Mean ± SD for continuous data and proportions for categorical data. Logistic regression was performed to assess the association between variables and patients' awareness on risk factors, complications, and prevention of complications of hypertension.
Results: Four hundred and fifty hypertensive patients with mean age of 57.00 ± 12.60 years were enrolled in the study. Females accounted for 52.90% of the study population. More than one-third (35.60%) of patients had low level of awareness on the risk factors, complications and preventive measures of complication of hypertension. Having higher education level, having a long standing history of hypertension of more than 5 years, and a positive family history of hypertension were all associated with high level of awareness among hypertensive patients.
Conclusion: The findings show that a considerable number of hypertensive patients are not aware of the risk factors, complications and preventive measures of hypertension. Assessing patients' awareness of risk factors and complications of hypertension during follow-up visits may improve patients' control of blood pressure and slow down the progression of complications.

Keywords: Awareness, Risk Factors, Complications, Hypertension

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Introduction

Hypertension and its complications are among the leading causes of admission in most health care facilities worldwide [1]. There has been an increasing incidence of hypertension and its complications which has resulted into significant morbidity and mortality [2]. It is estimated that by the year 2025, 1.56 billion of the world's population will be suffering from hypertension [3]. The Demographic Health Survey of Tanzania (DHS) estimated that 36% of adults above 18 years of age and 40% of adults above 45 years suffered from hypertension in 2016 [4].

Lowering the blood pressure is an advocated control measure of hypertension, and the success of control programs is based on the awareness and knowledge of the disease among the general population and hypertensive patients. The knowledge and awareness about hypertension influence patients to understand the importance of early detection, utilization of health care services, adequate treatment and strict control of their blood pressure [5]

There is insufficient documented evidence on the level of awareness about hypertension among Tanzanian population. The morbidity and mortality caused by hypertension and its complications has such a big impact on the country's economy and health care system [4] thus decreasing this burden is absolutely necessary. For this, it is vital that the general public and patients are aware of the risk factors, presenting features and complications of hypertension to enable better and earlier care seeking behaviour and thus earlier diagnosis.

Previous studies reported that the level of knowledge and awareness about treatment of hypertension range from 25 to 75% and that related to complications range from 10 to 70% in both the general population and the hypertensive patients worldwide [6-9]. For this reason, previous studies advocate institutionalizing education programs to increase community knowledge and awareness on hypertension and the compliance of patients to the screening programs. To make these programs more effective and successful, the level of awareness needs to be assessed. Making the hypertensive patients and the community aware of the risk factors and complications of hypertension can help achieve desirable control of hypertension and its complications.

Therefore, this study was designed to assess the awareness and knowledge among hypertensive patients on the risk factors of hypertension and its complications, and suggest measures to control blood pressure to prevent further complications.

Methods

Study Design and Study Setting

This cross-sectional study was conducted at a Regional Referral Hospital in Songea, Tanzania. This is a 395-bedded referral and teaching hospital providing tertiary care services to both urban and rural population in the southern part of Tanzania.

Study Sample and Data Collection

The study included 450 hypertensive patients, with and without complications of hypertension, aged from 17 years and those who attended the medical in-and out-patients departments from August 2017 to October 2017. The sample size was calculated using the Kish Leslie formula for sample size estimation for cross-sectional studies [10]. A non-random sampling method was used to recruit patients. Inclusion criteria included willingness to participate in the study, being a hypertensive patient, and age from 17 years and above.

Data were collected through face-to-face interview using a standardized structured questionnaire. The questionnaire contained information about patients' demographic characteristics, and a total of 23 questions assessing awareness of patients on risk factors for hypertension, complications of hypertension, and preventive measures of complications of hypertension. The study was approved by the University Review and Ethics Committee, and informed written consent was sought from participants before data collection.

Statistical Analysis

A descriptive analysis was conducted to determine blood pressures awareness among patients. Results are expressed as mean ± SD for continuous data and percentages for categorical data. Multivariable logistic regression analysis was

performed using Stata version 14 (Stata Corp. 2015. College Station, Texas, USA). Odds ratio and its 95% confidence interval was calculated to assess the association between variables and levels of awareness. For awareness, each right response to a question was awarded one point, and each wrong response was awarded a zero point. The maximum possible score to all questions was 23. The highest category of awareness scores were used to assess if the level of awareness was affected by patients' gender, level of education, location, occupation status, family history of hypertension, duration of having hypertensionand marital status. *P-value* of < 0.05 was considered as significant.

Results

Demographic characteristics of study subjects

A total of 450 patients were included in the study. The mean age was 57.00 ± 12.6 years (*range 40 - 95 years*). The demographic profile of the study participants is given in *Table 1*.

Table 1. Socio-Demographic profile of the study participants (n= 450)

Variables	*N (%)*
Age	mean = 57.00 ± 12.6 years
Gender	
Male	212 (47.10%)
Female	238 (52.90%)
Education	
No formal Education	64 (14.20%)
Primary	273 (60.70%)
Secondary	82 (18.20%)
Higher education	31 (6.90%)
Marital status	
Married	319 (70.90%)
Single	69 (15.30%)
Divorced	60 (13.30%)
Cohabiting	2 (0.50%)
Occupation status	
Peasant	275 (61.10%)
Employed	81 (18.00%)
Businessmen/women	94 (20.90%)
Residence	
Urban	320 (71.10%)
Rural	130 (28.90%)
Duration with hypertension (years)	
≤ 2	136 (30.20%)
3 – 4	83 (18.40%)
5 – 9	174 (38.70%)
≥ 10	57 (12.70%)
Family history of hypertension	
Absent	219 (48.70%)
Present	217 (48.20%)
Not sure	14 (3.10%)

Patients' levels of awareness

The maximum possible awareness score of patients on the risk factors, complications, and prevention of complications of hypertension was 23. The awareness score ranged from 6 to 23 with a mean score of 11.2. We categorized patients' awareness into three levels of not aware (0 – 7), moderately aware (8 – 15), and aware (16 – 23). *Table 2* shows categories of awareness scores for the interviewed patients.

Table 2. Patients' levels of awareness

Levels of awareness	*N (%)*
0 – 7 (not aware)	160 (35.6%)
8 – 15 (moderately aware)	239 (53.1%)
16 – 23 (aware)	51 (11.3%)

Awareness of risk factors, complications and prevention of complications

The responses of patients on the awareness of the risk factors for hypertension, its' complications and prevention of complications are given in *table 3*. Slightly more than 50% of patients were aware that obesity is a risk factor for hypertension and its complications. Only a few patients recognized gender, family history, age, race, and uncontrolled diabetes mellitus as potential risk factors for development of hypertension.

More than 50% of patients were aware that hypertension can be complicated by heart diseases and stroke, while about one-thirds of patients were aware that hypertension can be complicated by renal diseases and/or arterial diseases.

Almost all patients were aware that taking antihypertensive medications on regular basis can prevent or slow down progression of complications of hypertension. About a quarter of the patients were aware that cessation of cigarette smoking and/or cessation of alcohol consumption can prevent progression of complications of hypertension.

Table 3. Awareness of risk factors, complications and prevention of complications of hypertension among the study participants (n = 450)

Variables	*N (%)*
Risk factors	
Gender	9 (2.0%)
Age	29 (6.4%)
Race	7 (1.6%)
Family history of hypertension	32 (7.1%)
Uncontrolled diabetes mellitus	32 (7.1%)
Excessive salt intake	106 (23.6%)
Excessive alcohol intake	51 (11.3%)
Physical inactivity	114 (25.3%)
Obesity	242 (53.8%)
Smoking	123 (27.3%)
Stress	139 (30.9%)
Complications of hypertension	
Stroke	265 (58.9%)
Heart diseases	375 (83.3%)
Renal diseases	144 (32.0%)
Eye problem	199 (44.2%)
Arterial diseases	166 (36.9%)
Prevention of complications of hypertension	
Reduction in salt intake	231 (51.3%)
Stopping /Reducing alcohol intake	111 (24.7%)
Doing exercise	207 (46.0%)
Weight reduction	207 (46.0%)
Cessation of smoking	115 (25.6%)
Taking regular medication	450 (100.0%)

Association between demographic characteristics and level of awareness

This study assessed the association between patients' demographic characteristics and their awareness on risk factors, complications of hypertension and their preventive measures.

Table 4. The logistic regression analysis of the hypertension awareness with socio-demographic characteristics among hypertensive patients (n=450)

Predictor variables	Aware (score 16-23)		
	n	OR (95% CI)	*P*
Gender			
Males	28	1.00	
Females	23	0.70 (0.39-1.26)	0.30
Education			
No formal education	3	1.00	
Primary education	14	0.57 (0.30-1.09)	0.09
Secondary education	13	1.64 (0.83-3.23)	0.15
Higher education	21	27.23 (11.76-63.05)	0.00
Marital status			
Married	35	1.00	
Single	9	1.21 (0.56-2.62)	0.68
Divorced	6	0.85 (0.35-2.09)	0.83
Cohabiting	1	7.96 (0.49-129.26)	0.21
Occupation status			
Peasant	4	1.00	
Employed	33	13.41 (7.01-25.65)	1.37
Businessmen/women	14	1.51 (0.78-2.93)	0.27
Residence			
Urban	34	1.00	
Rural	17	1.27(0.68-2.36)	0.51
Duration with hypertension (years)			
≤ 2	4	1.00	
3 – 4	6	0.56 (0.23-1.35)	0.25
5 – 9	12	0.45 (0.23-0.89)	0.02
≥ 10	29	17.47 (8.90-34.28)	0.00
Family history of hypertension			
Absent	17	1.00	
Present	33	2.14 (1.17-3.93)	0.02
Not sure	1	0.60 (0.08-4.64)	1.00

Abbreviations: n, positive number; OR, Odd Ratio; CI, Confidence Interval

The awareness about risk factors, complications of hypertension and its prevention was found to be unaffected by patients' gender, marital status, occupation status and residence of patients. Participants who had higher education level ($p< 0.05$), those who have had hypertension for 5 to 9 years ($p< 0.05$), and for more than 10 years ($p< 0.05$), and participants with a positive family history of hypertension ($p< 0.05$) showed a higher level of awareness by multivariable logistic regression analysis. The logistic regression analysis of the risk factors, complications of hypertension, its prevention, and awareness of patients according to their socio-demographic characteristics are shown in *Table 4*.

Discussion

This study assessed awareness and knowledge

on risk factors, complications and prevention of complications of hypertension among a hypertensive cohort treated at a tertiary level hospital in Southern Tanzania. Study participants with primary level of education, married patients, peasants, and those living in the urban area dominated the study group.

Although a participant who has heard of particular risk factors, complications or preventive measures of complications of hypertension was defined as having awareness, a more understanding of the parameters is important for strict control of blood pressure [5]. Previous studies show dissimilarities on the percentages of patients with awareness of hypertension variables due to demographics of the study groups of different countries [6-9]. In the present study, only 11.30% of patients demonstrated acceptable level of awareness on the risk factors and complications of hypertension and their prevention. This percentage lies between those reported elsewhere [8, 9].

About one-third of the study participants were not aware of the risk factors, complications of hypertension, and its preventive measures. Moreover, gender, residence, marital and occupational status had no effect on the low level of awareness. The existing literature on hypertension suggests that psychologically men are likely to refrain from engaging in health-promoting programs or seeking early health care because of their manly behavior to avoid showing weakness; therefore, they tend to become less aware of various aspects of the disease. Although gender did not show any significant difference for awareness on hypertension in this study, previous studies reported different findings regarding the association between gender and hypertension awareness [11, 12]. Regular visits to health care facilities are important in improving awareness on hypertension among individuals of both genders. The present study involved patients, both men and women, who attended the same clinic on regular visits and received the same care, it is thus less likely that gender will impact the level of awareness on hypertension.

Having higher education was found to have an impact on the awareness of hypertension comparing lower levels of education. This is partly due to the fact that people with high level of education are more likely to attend health care facilities, understand the written and visual documents and educate themselves on the disease. Further, having hypertension for a long time increased the score for awareness independently from the educational level. Kumar *et al* also showed that hypertensive patients with a long standing history of the disease had higher level of knowledge than those who have had the disease for a short duration [7]. The education given by health care practitioners during follow-up clinics and interaction of hypertensive patients with each other at health care facilities help to improve patients' knowledge and awareness [13, 14].

A spouse who lives with a hypertensive partner is likely to be aware of the disease following years of tending to the partner. Further, having jobs with unsatisfying low salaries and stressful work demands may influence development of hypertension in an individual. Such individuals are likely to experience signs and symptoms that may prompt seeking health care hence being aware of the disease. In this study however, patients' awareness on hypertension and its risk factors was unaffected by both marital status and patients' occupation. There is no explanation for this negative association but we can speculate that married individuals in this study do not share information about their diseases, and that patients' occupation is not the reason for hypertension among the study participants.

The present study also reported that having a family history of hypertension positively affects patients' awareness on risk factors and complications of the disease. A patient who had relatives with hypertension is likely to experience the disease in their families and learn about it more. The same is true for patients who have been having the disease for a long time. Similar findings have also been reported elsewhere and

this further emphasizes the importance of increasing awareness among patients and the general population [9, 11-13, 16].

Previous studies reported with varying degrees a common perception among hypertensive patients on the risk factors for complications of hypertension [11-13]. A Canadian study showed a relatively larger proportion of study participants were aware that cigarette smoking, stressful life style, excess body weight and living a sedentary life style predispose an individual to hypertension and its complications [16]. Similarly, a study in India showed a large proportion of participants perceived absence of salt restriction, lack of physical exercise, and irrational use of anti-hypertensive medications were the major risk factors for development of complications of hypertension [7]. Acknowledging the risk factors for hypertension would help enhance the treatment compliance among hypertensive patients and for the general population to give support to the disease prevention.

The percentage of patients who were aware that advanced age, gender, race, and uncontrolled diabetes mellitus are important risk factors for hypertension development was found to be very low (1.6% - 7.1%). More or less similar proportion of patients thought excessive alcohol intake (11.3%) is a risk for hypertension. Approximately 1 out of 2 people (53%) was aware that obesity was a risk for hypertension. Obesity has become an increasingly serious public health problem and should be considered as a common risk factor for hypertension and thus needs special control measures. Awareness and knowledge on the risk factors for hypertension is very important for targeting the population at risk in terms of the screening programs [17].

In general patients in this study seemed to be familiar with consequences of hypertension and the way they can be avoided. Previous studies have demonstrated that participants link hypertension with cardiac and renal failure [18], stroke and heart infarction [19], and stroke, cerebral and cardiac infarction [14]. In the present study, the respondents also connected elevated blood pressure with stroke, heart diseases and eye problems. A strong association between heart problems and stroke and elevated blood pressure might have been influenced by the fact that a number of patients who are attending the clinics had already developed these complications prior to being diagnosed as having elevated blood pressure. It was in fact the sequels of the disease that prompted patients to attend the clinic and not the disease itself.

It is also important to note the fact that all patients considered taking regular medicines is the best way of preventing complications of hypertension. Our findings are similar to those reported by Kjellgren *et al*. who showed that all study participants mentioned drugs as a means of controlling hypertension and thereby avoiding squeal of the disease [5].

The current study has some limitations such as the selection of the patients from a single center and selection bias could not be eliminated as in this study only hypertensive patients who agreed to participate were involved which would better suit the general population, thus there are chances of underestimating or overestimating the knowledge about hypertension in the general population if results obtained in this study are to be projected.

Conclusion

Awareness of study subjects on risk factors, complications, and preventive measures of complications of hypertension was found to be low. The awareness was relatively high in individuals who have high level of education, have a long standing history of the disease, and those who have a family history of hypertension. We recommend assessing patients' awareness of risk factors and complications of hypertension during follow-up visits at health care facilities in order to improve patients' control of blood pressure and to slow down disease progression of complications.

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Conflict of interest

Authors declare no conflict of interests.

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