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RESEARCH ARTICLE

Prevalence and Risk Factors of Hypertension and Associated Factors

[version 1; peer review: awaiting peer review]

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Abstract

Background

Hypertension (HTN) is the most prevalent preventable risk factor that causes a significant socioeconomic burden associated with cardiovascular diseases (CVDs) and is the single most common cause of heart failure and myocardial infarction. Sub-Saharan countries, including Uganda, are still among the worst hit in terms of CVD mortality rates due to hypertension. More than 15 million global disability-adjusted life-years in sub-Saharan Africa are attributable to HTN.

Method

This was a cross-sectional study conducted among Kampala International University (KIU) staff. A total of 232 KIU staff members were selected randomly from among those who consented, including medical doctors, biomedical staff, and administration staff. The questionnaire was structured into three parts: socio-demographic characteristics, habit and lifestyle, awareness, family history, comorbidities, and clinical assessment. Blood pressure (BP) measurements were performed on the left arm of respondents in a sitting position using the Omron digital BP monitor, and data were

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entered into Microsoft Excel and exported to SPSS for analyses. Frequencies, percentages, and binary logistic regression were used to identify the risk factors for hypertension (p values < 0.5 were entered.

Results

Our findings show that high salt intake from patronized western food vendors or processed foods, high alcohol consumption, and smoking were implicated in the high prevalence of hypertension among our respondents within the 25-34years age bracket

Conclusion

High salt intake from patronized western food vendors or processed foods, high alcohol consumption, and smoking may be risk factors for the onset of HTN, and engagement in physical activities among younger adults can contribute to hypertension-free lives among the respondents and frequent consumption of fruits and vegetables. It is important that awareness of salt intake, alcohol intake, and smoking be propagated, especially among younger staff, in an effort to reduce the incidence of hypertension later in life. Regular health screening of KIU staff is recommended.

Keywords
Keywords: Hypertension, cardiovascular diseases, heart failure, alcohol, smoking and salt

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Abbreviations

BP: Blood pressure
CVDs: Cardiovascular disease
HTN: Hypertension

Introduction

Cardiovascular disease (CVDs) is the primary cause of morbidity and mortality worldwide, and hypertension is the major predisposing factor for most cardiovascular diseases such as coronary artery disease, stroke, peripheral vascular disease, and arterial fibrillation.[1]

Hypertension (HTN) is the most prevalent preventable risk factor that causes a significant socioeconomic burden associated with CVDs and is the single most common cause of heart failure and myocardial infarction.[2] HTN was defined as a diastolic blood pressure ≥ 90 mmHg and/or systolic blood pressure ≥ 140 mmHg. The incidence rates of hypertensive cases are increasing worldwide, across all people of different socioeconomic backgrounds, and among all regions owing to the rapid rise in urbanization and economic progress.[3] HTN is the third major contributor to global disease after underweight and unsafe sex.[3]

Sub-Saharan countries, including Uganda, are still among the worst hit in terms of CVD mortality rates due to hypertension.[4] More than 15 million global disability-adjusted life-years in sub-Saharan Africa are attributable to HTN; thus, identifying factors associated with the progressive surge in the burden of HTN in the region is vital for providing information regarding targeted public health interventions.[5] Globally, the four major risk factors for hypertension and CVDs are tobacco use, unhealthy diet, sedentary lifestyle, and harmful alcohol consumption.[6] In addition, demographic factors, such as population aging and population growth, and epidemiologic factors, such as a shift to Western diets and lifestyles, have also been suggested to contribute to the surge of HTN in sub-Saharan Africa.[7]

An international perspective has indicated that the working population is a high-risk group for HTN due to predisposition to numerous risk factors, such as smoking, high body mass index (BMI), and pre-hypertension (systolic blood pressure of 120-139 mmHg and/or a diastolic blood pressure of 80-89 mmHg).[8] Other risk factors that predispose the general population to hypertension include diabetes, obesity, overweight sleep apnea, high salt intake, alcohol consumption, elderly populations (advanced age), smoking, and lack of physical activity.[9] However, unlike Western countries, African countries have experienced progressive increases in morbidity and mortality due to HTN and associated CVDs, with an associated increase in premature deaths due to CVDs in the last two decades.[10]

In Uganda, the prevalence of HTN ranges from 11-32% among Ugandan populations, but no study has examined the magnitude of HTN among university employees, especially in the wake of the COVID19 pandemic that has resulted in most private university employees being owed salaries for several months due to lockdown restrictions.[11] A previous cross-sectional population-based study among adult and adolescent Ugandans determined the geographical variability of HTN among the different regions of Uganda and found that the prevalence of HTN was the highest among young adults aged 21–40 years in all four regions of Uganda (Central, East, West, and North).[11] This age bracket (21–40 years) forms the majority of staff strength in most private universities. Additionally, the University workplace is an ideal place for impacting knowledge and promoting health awareness.[12] However, little focus has been given to university occupational workers, especially those working in private universities during the COVID19 lockdown restrictions that have affected the salaries of this set of workers. Relevant information on the prevalence, determinants, and demographics of HTN in the University occupational population in a private setting is crucial for establishing targeted and effective workplace-based intervention policies and programs; this formed the basis for our study.

This study aimed to determine the prevalence of HTN and examine the risk factors associated with HTN in a sample of university employees at a private university in Uganda (Kampala International University, western campus).

Material and methods

Study setting

This study was conducted at the Kampala International University Western Campus Ishak-Bushenyi Uganda. The university is located in western Uganda.

Study design

This cross-sectional study was conducted at the Kampala International University Staff. The staff were selected randomly, especially those who consented, including medical doctors, biomedical staff, and administrative staff.

Sample size
This study was based on the study areas estimated by the Kampala International University Western Campus, with a sample size of 250. Consequently, a final sample size of 232 participants was determined based on the people who gave their consent. The sample size was calculated as described references.[13]

Inclusion and exclusion criteria
Participants who were Kampala International University Staff were included in the study, while those who were not staff were not included.

Data collection technique and tool
The questionnaire was piloted in a small number of selected study areas. It was structured into three parts: socio-demographic characteristics, habits and lifestyle, awareness, family history, comorbidities, and clinical assessment.

Physical measurements
Blood pressure

Blood pressure (BP) measurements were performed on the left arm of the participants in a sitting position using an Omron digital BP monitor (Omron Healthcare Co. Kyoto, Japan), with a suitable adult cuff. Two BP measurements were taken for each respondent at 5 min intervals and the mean of the two measurements was assigned as the final BP of the respondents.

Statistical analysis
Data were entered into Microsoft Excel and exported to SPSS for analysis. A summary of the data was examined using descriptive statistics including frequencies and percentages. Binary logistic regression was performed to identify the risk factors for hypertension, with P-values < 0.5 were entered.

Results
Habit on salt
A total of 126 respondents, representing 53.3% of the study population (n=232), had no knowledge of the quantity of salt they consumed daily, of which 52 respondents age 25-34yrs constituted the majority (41.3%), and the majority of the respondents were males (52.4%). 69 respondents representing 29.7% of the study population (n=232), reported that they consumed less than 6 g of salt daily, of which the majority fell within the age 25-34yrs, majority of the respondents were males (58%). 37 respondents representing (15.9%) reported that they consumed more than 6 g of salt daily; of this population, the majority fell within the age 25-34yrs. The majority of respondents were females (58%) (Tables 1, 2, 3 and 4).

Habit on fruit
86 respondents representing 37% of the study population, reported that they consumed less than ½ plates of fruit or vegetables, with the majority being age 25-34yrs (51.2%). The majority of respondents were females (61.5%). 82 respondents representing 35% of the study population were unsure of the quantity of fruits or vegetables they consumed, representing 51.2% of are female, while 64 (28%) reported that they consumed more than ½ plate of fruit or vegetables with the majority (42.2%) within the age 35-44yrs. The majority of respondents were male (70.3%) (Tables 1, 2, 3 and 4).

Habit on alcohol
A total of 151 (65%) respondents reported that they did not consume alcohol, while 82 (34%) reported that they consumed alcohol, with the majority within age 25-34yrs (43.7%). 52 (22%) participants consumed alcohol occasionally, and the majority of them were age 25-34yrs (42.9%). Of the 52 (22%) who consumed alcohol occasionally, 49 had been consuming alcohol for more than three years, and the majority were age 25-34yrs (34.7%) (Tables 1, 2, 3 and 4).

Habit on smoking
Of the respondents, 146 (63%) reported that they did d not smoke, while 86 (37%) reported that they smoked. Of the 86 who smoked, 36 (41.8%) had been smoking for 1-3years and majority were within age 25-34yrs (50%), and the majority were males (20%) (Tables 1, 2, 3 and 4).

Sport activities
167 (71%) of the study population engaged in walking as a type of physical activity. The majority of patients in this group were age 25-34yrs and the majority were female (60.2). 46 (19.8%) of the study population engaged in running as a form

Table 1. Socio-demographic.

Characteristic		Frequency (%)
Age-group	**Under 24**	22(9.5)
	25-34	103(44.4)
	35-44	64(27.6)
	45 and Older	43(18.5)
Sex	**Female**	114(49.1)
	Male	118(50.9)
Marital Status	**Married/Cohabiting**	169(72.8)
	Separated/Divorced	8(3.4)
	Single	55(23.7)
Level of Education	**Certificate**	29(12.5)
	Degree	46(19.8)
	Diploma	21(9.1)
	Masters Or Phd	85(36.6)
	Primary Or Secondary	51(22)
Designation	**Administrative Staff**	52(22.4)
	Health Worker	49(21.1)
	Support Staff	72(31)
	Teaching Staff	59(25.4)
Nationality	**Non-Ugandan**	34(14.7)
	Ugandan	198(85.3)
Religion	**Christian**	141(60.8)
	Muslim	82(35.3)
	Others	9(3.9)
	Total	**232(100)**

of physical activity, the majority in this group were age 35-44yrs and were mostly male (84.8%), while 8 (3.4%) respondents engaged in swimming, gym as a type of physical exercise, and 7(3%) and 5 (2.2%) respondents engaged in biking. Whether swimming, gym, or biking, the majority constituents of the groups were age 25-34yrs, of the respondents, 113(48.7%) engaged in exercise for more than 30 min per day were in the age 25-34yrs and the majority were female (51.3%), while 91(39.2%) were engaged in exercise and 51(56%) were male (Tables 1, 2, 3 and 4).

Hypertension

132 (56.8%) 132 (56.8%) respondents reported that they were not hypertensive, 87 (37.5%) respondents reported that they did d not know if they were hypertensive, while 13 (5.6%) respondents reported they were hypertensive, and out of these 13 (5.6%) respondents, the majority were aged 45 years and above and were male (76.9%). 89(38.4%) of the respondents last checked their blood pressure more than a year ago; the majority were within age 25-34yrs and mostly were males (56.2%), while 75(32.3%) last checked their blood pressure within 6 to 12 months, the majority were within age 25-34yrs and mostly were males(50.7), and those who checked their blood pressure less than 6 months ago; 68(29.3) were within age 25-34yrs and mostly were females (55.9%). Of the respondents, 119 (51.3%) reported that they did not have a family member that was hypertensive, while 113 (48.7%) reported that they had a family member that was hypertensive. The majority were aged 45 years and above who are males (57.5%) (Tables 5, 6 and 7).

Clinical assessment

The majority had a normal systolic blood pressure (BP) of 155(100) when compared with age, especially age group 25-34 which is 82(52.9), followed by hypertension stage one 67(100), especially in the age group 35-44 which is 22(32.8). The

Table 2. Habits and life style.

Feature	Characteristics	Frequency (%)
How Much Table Salt Do You Consume In A Day?	**≤ ½ Table Spoon/Day (≤ 6 G/Day)**	69(29.7)
	> ½ Table Spoon (> 6 G/Day)	37(15.9)
	Not Sure	126(54.3)
How Much Fruits And Vegetables Do You Consume Per Serving?	**< ½ A Standard Plate**	86(37.1)
	> ½ A Standard Plate	64(27.6)
	Not Sure	82(35.3)
Do You Take Alcohol?	**No**	151(65.1)
	Yes	81(34.9)
If Yes, How Often Do You Take Alcohol?	**Every Day**	9(3.9)
	Every Weekend	16(6.9)
	Occasionally	56(24.1)
For How Long Have You Been Taking Alcohol?	**1-3 Years**	20(8.6)
	Less Than A Year	15(6.5)
	More Than 3 Years	46(19.8)
Do You Smoke?	**No**	146(62.9)
	Yes	86(37.1)
If Yes, For How Long Have You Been Smoking Cigarette?	**1-3 Years**	36(15.5)
	Less Than A Year	24(10.3)
	More Than 3 Years	26(11.2)
What Type Of Physical Activities Do You Do?	**Biking**	5(2.1)
	Gym	12(5.2)
	Running	46(19.8)
	Swimming	8(3.5)
	Walking	161(69.4)
How Frequent And Regular Do You Perform The Exercise?	**≥30 Min/Day, Most Days Of The Week**	**113(48.7)**
	< 30 Min/Day	28(12.1)
	Once In A While	91(39.2)
	Total	232(100)

majority had normal diastolic BP 121(100), especially age group 25-34 which is 55(45.5), followed by hypertension stage one 95(100), especially age group 25-35 which is 44(46.3). The females had more normal systolic BP than males 80(51.6) and 75(48.4), respectively, males had more normal diastolic BP than female 61(51.7) and 60(49.6), respectively (Tables 8, 9, 10 and 11).

The mean blood pressure of female indicated that there was an increase in systolic and diastolic mean BP with increasing age. The mean blood pressure of males indicated an increase in mean systolic BP and an almost constant level of mean diastolic BP (Table 11 and Figures 1 and 2).

Discussion

This study investigated the awareness of hypertension among university staff at Kampala International University (KIU). The findings of the study showed that 56.8% were not hypertensive, 37.5% did not know their status, and 5.6% were hypertensive within the age of 45 years and male. This indicates that awareness of hypertension was high among the respondents sampled for the study. This result supports previous findings documented at another University in Nigeria.[14]

Table 3. **Correlation of lifestyle and age.**

Features		Age (%)				Total		
		≤ 24	25-34	35-44	≥ 45		P-value	χ2
How much table salt do you consume in a day?	≤ ½ Table spoon/day (? 6 g/day)	11(15.9)	35(50.7)	15(21.7)	8(11.6)	69(100)	0.071	11.59
	> ½ Table spoon (> 6 g/day)	1(2.7)	16(43.2)	14(37.8)	6(16.2)	37(100)		
	Not sure	10(7.9)	52(41.3)	35(27.8)	29(23)	126(100)		
How much Fruits and vegetables do you consume per serving?	<½ a standard plate	15(17.4)	44(51.2)	18(20.9)	9(10.5)	86(100)	0	36.474
	> ½ a standard plate	1(1.6)	15(23.4)	27(42.2)	21(32.8)	64(100)		
	Not sure	6(7.3)	44(53.7)	19(23.2)	13(15.9)	82(100)		
Do you take alcohol?	No	16(10.6)	66(43.7)	46(30.5)	23(15.2)	151(100)	0.216	4.455
	Yes	6(7.4)	37(45.7)	18(22.2)	20(24.7)	81(100)		
If yes, how often do you take alcohol?	Every day	0(0)	6(66.7)	3(3.3)	0(0)	9(100)	0.17	12.843
	Every weekend	2(12.5)	7(43.8)	1(6.3)	6(37.5)	16(100)		
	Occasionally	4(7.1)	24(42.9)	14(25)	14(25)	56(100)		
	NO RESPONSE	16(10.6)	66(43.7)	46(30.5)	23(15.2)	151(100)	0.003	24.595
For how long have you been taking alcohol?	1-3 years	3(15)	14(70)	2(10)	1(5)	20(100)		
	Less than a year	3(20)	7(46.7)	3(20)	2(13.3)	15(100)		
	More than 3 years	1(2)	17(34.7)	13(26.4)	18(36.7)	49(100)		
	NO RESPONSE	15(10.1)	65(43.9)	46	22	148		
Do you smoke?	No	17(11.6)	61(41.6)	40(27.4)	28(19.2)	146(100)	0.451	2.64
	Yes	5(5.8)	42(48.8)	24(27.9)	15(17.4)	86(100)		
If yes, for how long have you been smoking cigarette?	1-3 years	2(5.6)	18(50)	11(30.6)	5(13.9)	36(100)	0.212	12.023
	Less than a year	0(0)	16(16.7)	6(15)	2(8.3)	24(100)		
	More than 3 years	3(11.5)	8(30.8)	7(26.9)	8(30.8)	26(100)		
	No	17(11.6)	61(41.8)	40(27.4)	28(19.2)	146(100)		

Table 3. *Continued*

Features		Age (%)				Total		
		≤ 24	25-34	35-44	≥ 45		P-value	$\chi 2$
What type of physical activities do you do?	**Biking**	0(0)	3(60)	1(20)	1(20)	5(100)	0.014	49.518
	Gym	0(0)	5(62.5)	1(12.5)	2(25)	6(100)		
	Running	2(4.3)	12(26.1)	23(50)	9(19.6)	46(100)		
	Swimming	1(16.7)	4(66,7)	0(0)	1(16.7)	6(100)		
	Walking	19(11.4)	79(44.1)	39(23.4)	30(21.1)	167(100)		
How frequent and regular do you perform the exercise?	**≥ 30 min/day, most days of the week**	14(12.4)	58(51.3)	29(25.7)	12(10.6)	113(100)	0.009	17.134
	< 30 min/day	2(7.1)	15(53.6)	7(25)	4(14.3)	28(100)		
	Once in a while	6(6.6)	30(33)	28(30.8)	27(29.7)	91(100)		
Total		22(9.5)	103(44.4)	64(27.6)	43(18.5)	232(100)		

Table 4. **Correlation of lifestyle and sex.**

Features		Sex (%)		Total (%)		
		Female	Male		P-Value	$\chi 2$
How much table salt do you consume in a day?	? ½ Table spoon/day(? 6 g/day)	40(58)	29(42)	69(100)	0.124	5.75
	> ½ Table spoon(> 6 g/day)	13(36.1)	23(63.9)	36(100)		
	> Â½ Table spoon(> 6 g/day)	1(100)	0(0)	1(100)		
	Not sure	60(47.6)	66(52.4)	126(100)		
How much Fruits and vegetables do you consume per serving?	< ½ a standard plate	53(61.6)	33(38.4)	86(100)	0.001	15.198
	> ½ a standard plate	19(29.7)	45(70.3)	64(100)		
	Not sure	42(51.2)	40(48.8)	82(100)		
Do you take alcohol?	No	90(59.6)	61(40.4)	151(100)	0.00	18.951
	Yes	24(29.6)	57(70.4)	81(100)		
If yes, how often do you take alcohol?	Every day	1(11.1)	8(88.9)	9(100)	0.00	25.774
	Every weekend	1(6.3)	15(93.8)	16(100)		
	Occasionally	22(39.3)	34(60.7)	56(100)		
	No	90(59.6)	61(40.4)	151(100)		
For how long have you been taking alcohol?	1-3 years	8(40)	12(60)	20(100)	0.00	25.135
	Less than a year	7(53.8)	6(46.2)	13(100)		
	More than 3 years	9(18.8)	39(81.3)	48(100)		
	No	90(78.9)	61(51.7)	151(65.1)		
Do you smoke?	Yes	37(43)	49(57)	86(100)	0.153	2.044
	No	77(52.7)	69(47.3)	146(100)		
If yes, for how long have you been smoking cigarette?	1-3 years	16(44.7)	20(55.6)	36(100)	0.55	2.097
	Less than a year	10(41.7)	14(58.3)	24(100)		
	More than 3 years	11(42.3)	15(57.7)	26(100)		
		77(52.7)	69(47.3)	146(100)		

Table 4. *Continued*

Features		Sex (%)		Total (%)		
		Female	Male		P-Value	$\chi 2$
What type of physical activities do you do?	**Biking**	1(20)	4(80)	5(100)	0.00	32.251
	Gym	2(28.6)	5(71.4)	7(100)		
	Running	7(15.2)	39(84.8)	46(100)		
	Swimming	4(50)	4(50)	8(100)		
	Walking	100(60.2)	66(39.6)	166(100)		
How frequent and regular do you perform the exercise?	**? 30 min/day, most days of the week**	58(51.3)	55(48.7)	113(100)	0.38	1.912
	< 30 min/day	16(57.1)	12(42.9)	28(100)		
	Once in a while	40(44)	51(56)	91(100)		
Total		**114(49.1)**	**118(50.9)**	**232(100)**		

Table 5. Awareness, family history and co-morbidities.

Features		Frequency (%)
Are You Hypertensive?	**I Don't Know**	87(37.5)
	No	132(56.7)
	Yes	13(5.6)
When Did You Last Check Your Blood Pressure?	**6-12 Months Ago**	75(32.3)
	Less Than 6 Months Ago	68(29.3)
	More Than 1 Year Ago	89(38.4)
Do You Have A Member In The Family With Or Had Hypertension?	**No**	119(51.3)
	Yes	113(48.7)
Which Other Chronic Illness Do You Have?	**Heart Disease**	1(0.4)
	Kidney Disease	5(2.2)
	None	215(92.7)
	Others	11(4.7)
	Total	**232(100)**

According to our report, the majority last check their blood pressure about a year ago and within the age 25-34yrs. According to a study on the global epidemiology of hypertension, the majority of people do not regularly check their blood pressure even if they are aware that they are at risk of high blood pressure.[15]

Based on salt intake, 53.3% of the study population (n=232) had no knowledge of the quantity of salt they consumed daily, and the majority were males, while 15.9% reported that they consumed more than 6 g of salt daily. Participants who were in the 25-34 years' age bracket were the most affected, and the majority of the respondents were female (58%). This is consistent with a previous study that reported poor knowledge of dietary salt intake in Uganda.[16] Another study reported poor knowledge of the effect of diet on stroke risk among Ugandans.[17] This lack of knowledge of salt intake and risk suggests that some Ugandans may consume more salt than the daily WHO requirement. A typical Ugandan food consists of plantains, roots, or tubers with low sodium; thus, salt added during cooking and table salt serve as the major sources of excessive sodium intake among Ugandans.[18]

Despite the reported higher mean levels of salt intake (3.95g/d) in Uganda compared to WHO standards, the mean salt intake reported in Uganda was fairly consistent with reports from other African countries such as Ghana which was documented to have 5.8g/d[19]; and Mauritius which was estimated to have 5.45g/d.[20] Excess salt intake has been implicated in high blood pressure and the onset of hypertension and cardiovascular complications,[21,22] and some authors have reported that excessive salt intake may induce several adverse effects such as microvascular endothelial inflammation, anatomic remodeling, and functional abnormalities even in normotensive subjects.[23] Therefore, the study suggests that there should be a change in dietary salt consumption habits in an effort to improve BP control and reduce the incidence of hypertension among staff.

Based on fruit or vegetable intake, 37.1% of the participants in the age bracket of 25-34 years consumed less than half a plate of fruits or vegetables, 35.3% were unsure of the quantity they consumed daily, and 27.6% of participants in the age bracket of 35-44 years consume more than half a plate of fruit and vegetables daily. Studies have proposed that vegetable-based diets can lower BP and the incidence of hypertension in persons compared to individuals who consume regular Western diets.[24,25] A study by[26] reported that fruit intake was more strongly and significantly associated with a lower risk of hypertension than vegetable intake. Similar weak associations between vegetable intake and a lower risk of hypertension have been documented elsewhere.[27,28] The reasons behind the participants in the age bracket of 25-34 years consuming less fruits and vegetables compared to those in the age bracket of 35-44 years may be due to the fact that younger individuals crave more for Western diets than the elderly.

Based on alcohol habits, 65.1% of the respondents reported that they did d not consume alcohol, 34.9% reported taking alcohol, and 19.8% reported taking alcohol for more than three years. The reported age bracket implicated in alcohol intake in this study was those within 25-34 years. Some researchers have suggested that low-to-moderate alcohol intake

Table 6. **Correlations of awareness, family history, co-morbidities and age.**

Characteristic		Age (%)				Total	P-Value	$\chi 2$
		≤ 24	25-34	35-44	≥ 45			
Are you hypertensive?	**I dont know**	8(9.2)	50(57.5)	21(24.1)	8(9.2)	87(100)	0.000	47.555
	No	13(9.8)	53(40.2)	42(31.8)	24(18.2)	132(100)		
	Yes	1(7.7)	0(0)	1(7.7)	11(84.6)	13(100)		
When did you last check your blood pressure?	**6-12 months ago**	6(8)	40(53.3)	19(25.3)	10(13.3)	75(100)	0.209	8.417
	Less than 6 months ago	7(10.3)	26(38.2)	16(23.5)	19(27.9)	68(100)		
	More than 1 year ago	9(10.1)	37(41.6)	29(32.6)	14(15.7)	89(100)		
Do you have a member in the family with or had hypertension?	**No**	14(11.8)	69(58)	30(25.2)	6(5)	119(100)	0.000	35.997
	Yes	8(7.1)	34(30.1)	34(30.1)	37(32.7)	113(100)		
Which other chronic illness do you have?	**Heart disease**	1(100)	0(0)	0(0)	0(0)	1(100)	0.043	17.371
	Kidney disease	0(0)	1(20)	3(60)	1(20)	5(100)		
	None	18(8.4)	98(45.6)	58(27)	41(19.1)	215(100)		
	Others	3(27.3)	4(36.4)	3(27.3)	1(9.1)	11(100)		
Total		**22(9.5)**	**103(44.4)**	**64(27.6)**	**43(18.5)**	**232(100)**		

Table 7. **Correlations of awareness, family history, co-morbidities and sex.**

		Sex (%)		Total ()	P-value	chi-square
		Female	Male			
Are you hypertensive?	**Yes**	3(23.1)	10(76.9)	13(100)	0.15	3.743
	No	67(50.8)	65(49.2)	132(100)		
	I dont know	44(50.6)	43(49.4)	87(100)		
When did you last check your blood pressure?	**6-12 months ago**	37(49.3)	38(50.7)	75(100)	0.324	2.246
	Less than 6 months ago	38(55.9)	30(44.1)	68(100)		
	More than 1 year ago	39(43.8)	50(56.2)	89(100)		
Do you have a member in the family with or had hypertension?	**Yes**	48(42.5)	65(57.5)	113(100)	0.05	3.91
	No	66(55.5)	53(44.5)	119(100)		
Which other chronic illness do you have?	**Heart disease**	1(100)	0(0)	1(100)	0.362	3.2
	Kidney disease	4(80)	1(20)	5(100)		
	None	103(47.9)	112(52.1)	215(100)		
	Others	6(54.5)	5(45.5)	11(100)		
Total		**114(49.1)**	**118(50.9)**	**232(100)**		

Table 8. **Clinical assessment (reference table of blood pressure).**

BLOOD PRESSURE	SYSTOLIC mmHg (Upper number)	DIASTOLIC mmHg (Lower number)
NORMAL/ELEVETED	≤ 129	**≤ 80**
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1	130-139	81-89
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2	140-179	90-119
HYPERTENSIVE CRISIS	≥180	≥120

Table 9. **Comparison of blood pressure with age.**

		Age (%)				Total	P-value	$\chi 2$
		≤ 24	**25-34**	**35-44**	**≥45**			
Systolic	**≤ 129**	17(11)	82(53.2)	37(24.5)	18(11.7)	154(100)	0.000	30.263
	130-139	5(7.4)	21(30.9)	23(33.8)	19(27.9)	68(100)		
	140-179	0(0)	0(0)	4(40)	6(60)	10(100)		
Diastolic	**≤ 80**	17(14)	55(45.5)	32(26.4)	17(14)	121(100)	0.014	16.007
	81-89	3(3.2)	44(46.3)	29(30.5)	19(20)	95(100)		
	80-119	2(12.5)	4(25)	3(18.8)	7(43.8)	16(100)		
Total		**22(9.5)**	**103(44.4)**	**64(27.6)**	**43(18.5)**	**232(100)**		

Table 10. **Comparison of blood pressure with sex.**

		Sex (%)		Total	P-value	χ2
		Male	Female			
Systolic	**≤ 129**	74(48.1)	80(51.6)	154(100)	0.471	1.506
	130-139	38(55.2)	30(44.8)	68(100)		
	140-179	6(60)	4(40)	10(100)		
Diastolic	**< 80**	61(51.7)	60(49.6)	121(100)	0.622	0.950
	80-89	47(49.5)	48(50.5)	95(100)		
	90-119	10(62.5)	6(37.5)	16(100)		
Total		**118(50.9)**	**114(49.1)**	**232(100)**		

Table 11. **Mean blood pressure.**

Average SBP	125.57 ± 0.513 mmHg
Average DBP	81.47 ± 0.326 mmHg
Mean SBP male	126.03 ± 0.762 mmHg
Mean DBP male	80.79 ± 0.784 mmHg
Mean SBP female	125.1 ± 0.684 mmHg
Mean DBP female	81.54 ± 0.447 mmHg

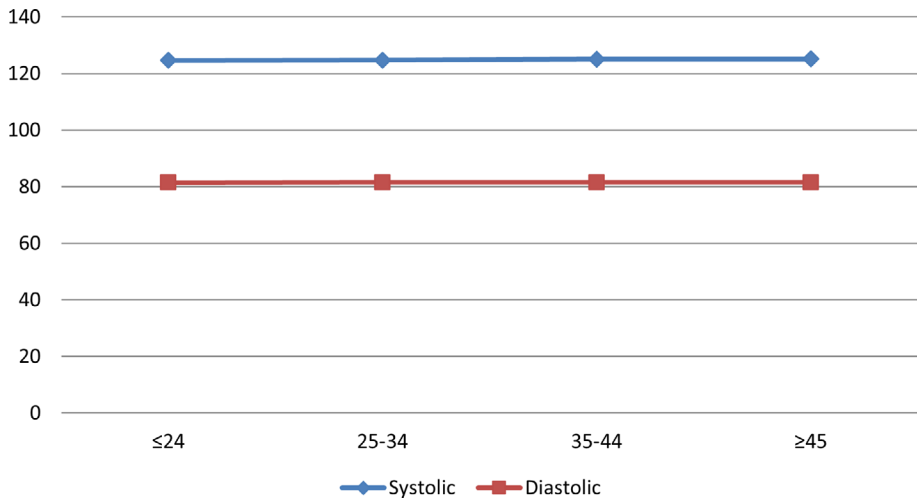


Figure 1. **Mean blood pressure of female.**

could be beneficial to the cardiovascular system and help lower blood pressure.[29] Alcohol has been used as an analgesic and is widely available to people with pain.[30] Chronic consumption of a high dose of alcohol has been associated with hepatic, gastrointestinal, nervous, and cardiovascular injuries and physiological dysfunction.[31] Some clinical and epidemiological studies have documented that chronic alcohol intake is associated with an increased incidence of hypertension and increased risk of cardiovascular diseases.[32,33]

Based on smoking habits, 62.9% of the respondents did d not smoke, 37.1% smoked, and 15.5% had been smoking for more than 3 years and were in the age bracket of 25-34 years. Several studies have reported evidence that cigarette smoking causes various adverse cardiovascular events[34,35] and synergistically acts with hypertension and dyslipidemia to

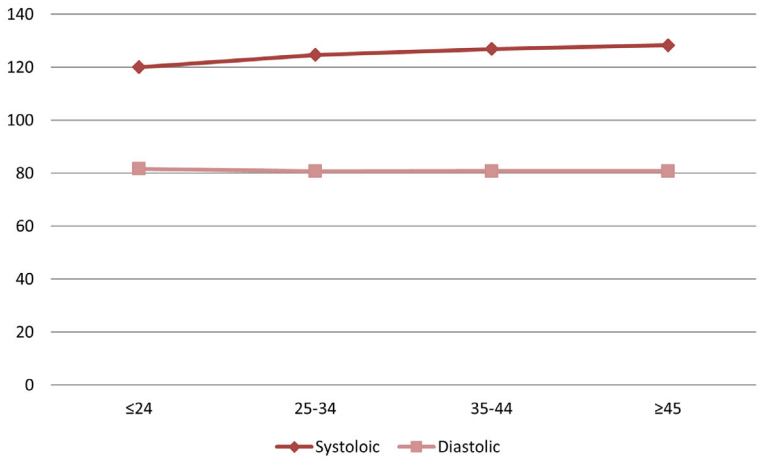


Figure 2. Mean blood pressure of male.

increase the risk of coronary heart disease.[36] It has been established that smoking causes an acute increase in blood pressure and heart rate and this has been implicated in malignant hypertension.[37] Smoking is strongly associated with alcohol intake and similarly affects blood pressure in like manner.[38]

Based on sports/physical activities, 71% of the respondents reported engaging in walking as a form of physical activity, 19.8% engaged in running, 2.6% engaged in swimming, 2.1% engaged in biking, and the majority were in the age bracket of 25-34 years. Exercise is documented to prevent or reduce the effects of metabolic and cardiovascular diseases such as hypertension.[39] Exercise alone or combined with lifestyle modification has been associated with a decrease in blood pressure and a reduced need for pharmacological therapy in patients with hypertension.[40] Exercise reportedly regulates autonomic nervous system activity, increases shear stress, improves nitric oxide production in endothelial cells and its bioavailability for vascular smooth muscle, and upregulates antioxidant enzymes.[41]

Based on clinical assessment it shows that majority have a normal systolic/diastolic blood pressure (BP) when compare to age especially age group 25-34, followed by hypertension stage one especially at age group 35-44, According to our data, elderly adults typically have greater blood pressure. As suggested in[42]: High blood pressure, also known as hypertension, is particularly common in elderly people and becomes much more common as they age.

The mean blood pressure of female indicated that there was an increase in systolic and diastolic mean BP with increasing age. The mean blood pressure of males indicated an increase in mean systolic BP and an almost constant level of mean diastolic BP. According to statistics, younger men tend to have higher blood pressure than women, but as women age, their blood pressure tends to rise above that of men.[43,44]

Conclusion

In conclusion, the study reported that awareness of hypertension was high, respondents in the age bracket 25-34 years reportedly had more salt intake because they patronize Western foods or processed foods, consume more alcohol, smoke more, and engage in more physical activities, while the older age groups consumed more fruits and vegetables. It is important that awareness of salt intake, alcohol intake, and smoking be propagated, especially among younger staff, in an effort to reduce the incidence of hypertension later in life. Regular health screening of KIU staff is recommended.

Ethical approval

The study was approved by Research and Ethics Committee of Kampala International University-Western Campus, Uganda, and was registered as KIU-2021-14.

A verbal Inform consent was ask from all participant before data was collected and all participant were adult not minors and those who did not approved the were not included in the research, verbal consent was used because only adult were used and the study was explain and those who gave consent were used.

Data availability

Figshare: Prevalence and Risk Factors of Hypertension and Associated Factors. https://doi.org/10.6084/m9.figshare.31215685.[45]

This project contains the following data:

- hypertention raw data

Data are available under the terms of the Creative Commons Attribution 4.0 International license (CC-BY 4.0).

References

1. Pabst S, Hammerstingl C, Nickenig G, *et al.*: **Therapie nach aktuellen Leitlinien: Praktisches Management der pulmonal arteriellen Hypertonie.** 2010.
Publisher Full Text
2. Samhouri B, Kanj A, Olson E: **HYPERCAPNIA AND ATRIAL ARRHYTHMIAS IN A PATIENT WITH A LARGE HIATAL HERNIA.** *Chest.* 2020.
Publisher Full Text
3. Wong A, Izuka S, Aslam W: **CAUTION! TOXIC INFECTION AHEAD: A CASE OF TOXIC SHOCK SYNDROME CAUSED BY STREPTOCOCCUS DYSGALACTIAE.** *Chest.* 2023.
Publisher Full Text
4. Okeahialam BN, Ogah OS: **Editorial: Cardiovascular anthropometry for large scale population studies.** 2023.
Publisher Full Text
5. Kalanjati VP, Oktariza RT, Suwito BE, *et al.*: **Cardiovascular disease risk factors and anthropometry features among seemingly healthy young adults.** *Int. J. Public Heal. Sci.* 2021.
Publisher Full Text
6. Roman WP, Martin HD, Sauli E: **Cardiovascular diseases in Tanzania: The burden of modifiable and intermediate risk factors.** 2019.
Publisher Full Text
7. Mphekgwana PM, *et al.*: **Screening and Interventions for Cardiovascular Disease Prevention in the Limpopo Province, South Africa: Use of the Community Action Model.** *Metabolites.* 2022; **12**.
PubMed Abstract | Publisher Full Text | Free Full Text
8. Sonkodi B, *et al.*: **High prevalence of prehypertension and hypertension in a working population in Hungary.** *Am. J. Hypertens.* 2012; **25**: 204–208.
PubMed Abstract | Publisher Full Text
9. Aschermann M: **The year in cardiovascular medicine 2020.** 2021.
Publisher Full Text
10. Verma S, *et al.*: **Prevalence of Diabetes and Cardiovascular Risk in the Middle East and Africa: Primary Results of the PACT-MEA Study.** *Circulation.* 2023; **147**: 1251–1255.
PubMed Abstract | Publisher Full Text | Free Full Text
11. Lunyera J, *et al.*: **Geographic differences in the prevalence of hypertension in Uganda: Results of a national epidemiological study.** *PLoS One.* 2018; **13**.
PubMed Abstract | Publisher Full Text | Free Full Text
12. Olum R, Chekwech G, Wekha G, *et al.*: **Coronavirus Disease-2019: Knowledge, Attitude, and Practices of Health Care Workers at Makerere University Teaching Hospitals, Uganda.** *Front. Public Health.* 2020; **8**.
PubMed Abstract | Publisher Full Text | Free Full Text
13. Dejenie M, Kerie S, Reba K: **Undiagnosed hypertension and associated factors among bank workers in Bahir Dar City, Northwest, Ethiopia, 2020. A cross-sectional study.** *PLoS One.* 2021; **16**.
PubMed Abstract | Publisher Full Text | Free Full Text
14. Abdullahi AA, Amzat J: **Knowledge of hypertension among the staff of University of Ibadan, Nigeria.** *J. Public Heal. Epidemiol.* 2011.
15. Vaseghi N, *et al.*: **Global prevalence and subgroup analyses of coronavirus disease (COVID-19) associated Candida auris infections (CACa): A systematic review and meta-analysis.** 2022.
Publisher Full Text
16. Kaddumukasa MN, Katabira E, Sajatovic M, *et al.*: **Influence of sodium consumption and associated knowledge on poststroke hypertension in Uganda.** *Neurology.* 2016; **87**: 1198–1205.
PubMed Abstract | Publisher Full Text | Free Full Text
17. Kaddumukasa M, *et al.*: **Knowledge, attitudes and perceptions of stroke: A cross-sectional survey in rural and urban Uganda.** *BMC. Res. Notes.* 2015; **8**.
PubMed Abstract | Publisher Full Text | Free Full Text
18. Jabban YKE, *et al.*: **Assessment Syrian Population Knowledge, Attitudes and Perceptions Towards Stroke: A Cross-Sectional Study from Syria.** *Int. J. Med. Students.* 2023.
Publisher Full Text
19. Cappuccio FP, Kerry SM, Micah FB, *et al.*: **A community programme to reduce salt intake and blood pressure in Ghana [ISRCTN88789643].** *BMC Public Health.* 2006; **6**.
PubMed Abstract | Publisher Full Text | Free Full Text
20. Powles J, *et al.*: **Global, regional and national sodium intakes in 1990 and 2010: A systematic analysis of 24 h urinary sodium excretion and dietary surveys worldwide.** 2013.
Publisher Full Text
21. Saleem M, Ertuglu L, Pitzer Mutchler A, *et al.*: **Abstract P418: Antigen-presenting Cell-specific MAP-kinase Signaling Contributes To Inflammation And Salt-sensitivity Of Blood Pressure In Humans.** *Hypertension.* 2023.
Publisher Full Text
22. Ikeda N, Yamashita H, Hattori J, *et al.*: **Reduction of Cardiovascular Events and Related Healthcare Expenditures through Achieving Population-Level Targets of Dietary Salt Intake in Japan: A Simulation Model Based on the National Health and Nutrition Survey.** *Nutrients.* 2022; **14**.
PubMed Abstract | Publisher Full Text | Free Full Text
23. Strazzullo P, D'Elia L, Kandala NB, *et al.*: **Salt intake, stroke, and cardiovascular disease: Meta-analysis of prospective studies.** *BMJ.* 2009; **339**.
PubMed Abstract | Publisher Full Text | Free Full Text
24. Hjelmesæth J, Sjöberg A: **Human body weight, nutrients, and foods: a scoping review.** 2022; **66**.
PubMed Abstract | Publisher Full Text | Free Full Text
25. Timon CM, O'connor A, Bhargava N, *et al.*: **Dairy consumption and metabolic health.** 2020; **12**.
PubMed Abstract | Publisher Full Text | Free Full Text
26. Wang X, *et al.*: **Fruit and vegetable consumption and mortality from all causes, cardiovascular disease, and cancer: Systematic review and dose-response meta-analysis of prospective cohort studies.** *BMJ.* 2014; **349**.
PubMed Abstract | Publisher Full Text | Free Full Text
27. Wang L, Manson JE, Gaziano JM, *et al.*: **Fruit and vegetable intake and the risk of hypertension in middle-aged and older women.** *Am. J. Hypertens.* 2012; **25**: 180–189.
PubMed Abstract | Publisher Full Text | Free Full Text
28. Jahan Y, *et al.*: **Awareness development and usage of mobile health technology among individuals with hypertension in a rural community of Bangladesh: Randomized controlled trial.** *J. Med. Internet Res.* 2020; **22**: e19137.
PubMed Abstract | Publisher Full Text | Free Full Text
29. Mori TA, Burke V, Zilkens RR, *et al.*: **The effects of alcohol on ambulatory blood pressure and other cardiovascular risk factors in type 2 diabetes: A randomized intervention.** *J. Hypertens.* 2016; **34**: 421–8; discussion 428.
PubMed Abstract | Publisher Full Text
30. Dydyk AM, Sizemore DC, Haddad LM, *et al.*: **NP Safe Prescribing Of Controlled Substances While Avoiding Drug Diversion.** 2020.
31. Klatsky AL: **Alcohol-associated hypertension when one drinks makes a difference.** 2004.
Publisher Full Text
32. Kurhaluk N: **Alcohol and melatonin.** 2021.
Publisher Full Text

33. Schomerus G, Lucht M, Holzinger A, *et al.*: **The stigma of alcohol dependence compared with other mental disorders: A review of population studies.** 2011.
Publisher Full Text

34. Hahad O, Kuntic M, Kuntic I, *et al.*: **Tobacco smoking and vascular biology and function: evidence from human studies.** *Pflugers Arch. - Eur. J. Physiol.* 2023; **475**: 797–805.
PubMed Abstract | Publisher Full Text | Free Full Text

35. Khalil MAM, Tan J, Khamis S, *et al.*: **Cigarette Smoking and Its Hazards in Kidney Transplantation.** *Adv. Med.* 2017; **2017**.
PubMed Abstract | Publisher Full Text | Free Full Text

36. **A Cross Sectional Study on Hypertension and Tobacco Consumption in the Rural Adult Population of Kamrup, Assam.** *Int. J. Sci. Res.* 2017.
Publisher Full Text

37. Halimi JM, *et al.*: **Clinical characteristics and outcomes of a patient population with atypical hemolytic uremic syndrome and malignant hypertension: analysis from the Global aHUS registry.** *J. Nephrol.* 2023.
Publisher Full Text

38. Heris C, Guerin N, Thomas D, *et al.*: **Smoking behaviours and other substance use among Indigenous and non-Indigenous Australian secondary students, 2017.** *Drug Alcohol Rev.* 2021; **40**: 58–67.
PubMed Abstract | Publisher Full Text

39. Actrn: **Integrated Care for Atrial Fibrillation Management: a Randomised Controlled Trial.** 2016.
Reference Source

40. Sugawara J, *et al.*: **Effect of endurance exercise training and curcumin intake on central arterial hemodynamics in postmenopausal women: Pilot study.** *Am. J. Hypertens.* 2012; **25**: 651–656.
PubMed Abstract | Publisher Full Text

41. Narai E, Watanabe T, Koba S: **Hypothalamic Orexinergic Neurons Projecting to the Mesencephalic Locomotor Region Are Activated by Voluntary Wheel Running Exercise in Rats.** *Yonago Acta Med.* 2024; **67**: 52–60.
PubMed Abstract | Publisher Full Text | Free Full Text

42. Thongsroy J, Mutirangura A: **The association between Alu hypomethylation and the severity of hypertension.** *PLoS One.* 2022; **17**.
PubMed Abstract | Publisher Full Text | Free Full Text

43. Park JE, Park JH, Chang SJ, *et al.*: **The Determinants of and Barriers to Awareness and Treatment of Hypertension in the Korean Population.** *Asia-Pacific J. Public Heal.* 2019; **31**: 121–135.
PubMed Abstract | Publisher Full Text

44. Everett B, Zajacova A: **Gender differences in hypertension and hypertension awareness among young adults.** *Biodemography Soc. Biol.* 2015; **61**: 1–17.
PubMed Abstract | Publisher Full Text | Free Full Text

45. Tabakwot A, John J: **Hypertension raw data.** *figshare.* 2026.
Publisher Full Text

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