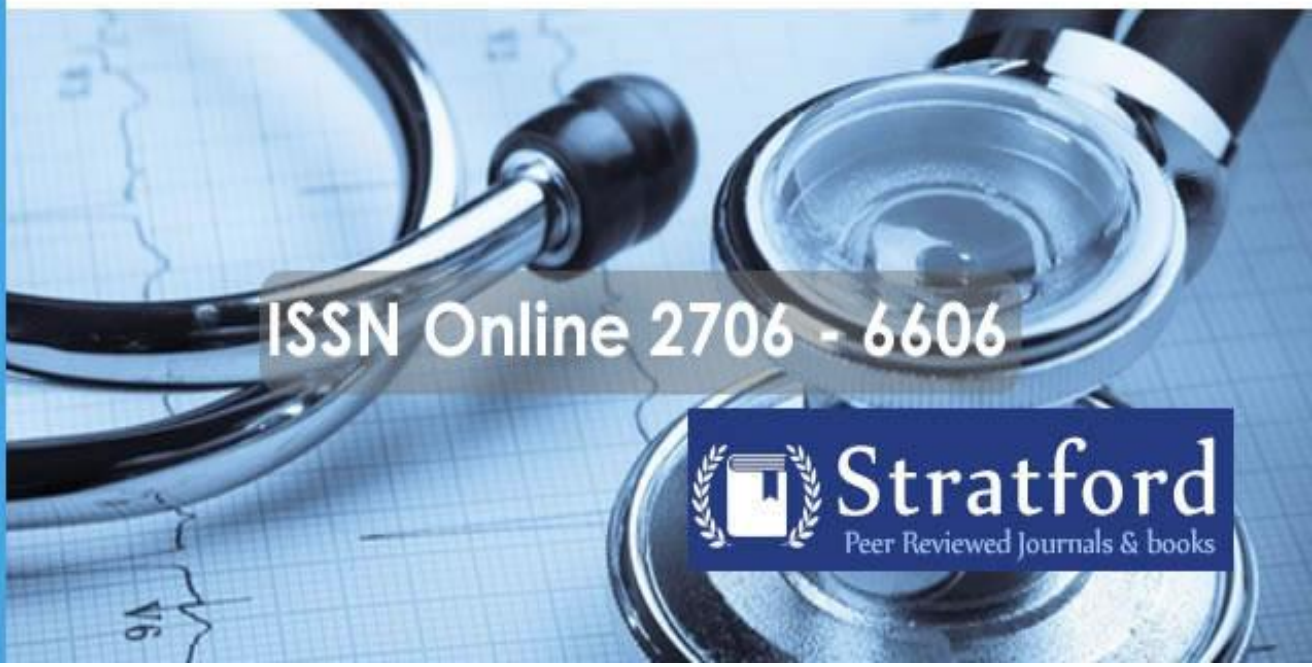
Journal of Medicine, Nursing & Public Health



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ISSN: 2706-6606

Stratford Peer Reviewed Journals and Book Publishing
Journal of Medicine, Nursing & Public Health
Volume 8||Issue 1||Page 1-16||January||2025|
Email: info@stratfordjournals.org ISSN: 2706-6606

High Blood Pressure among Young Adults Aged 18 - 45 Years Presenting for Care to a Health Center in Karongi District in Rwanda

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How to cite this article: **Masengesho, G., Ogendi, J., Dusabimana, I. & Mukamunana, Q. (2025). High Blood Pressure among Young Adults Aged 18 - 45 Years Presenting for Care to a Health Center in Karongi District in Rwanda.** ***Journal of Medicine, Nursing & Public Health,*** **8(1), 1-16.** https://doi.org/10.53819/81018102t4310

Abstract

Hypertension is a major global health challenge, significantly contributing to morbidity and mortality. This study investigates the prevalence and associated risk factors of hypertension among young adults aged 18 – 45 years in Karongi District, Rwanda, to inform effective prevention and management strategies. Hypertension prevalence serves as a critical measure of community health, with further epidemiological data needed to address treatment gaps, elevated prevalence rates, and suboptimal blood pressure control. The study also aims to promote routine blood pressure monitoring and highlight the efficacy of lifestyle interventions, including reduced salt intake, regular physical activity, weight loss, alcohol moderation, and smoking cessation, in managing hypertension. A cross-sectional analytical design was employed, utilizing patient questionnaires and observation checklists at Rubengera Health Center. Data analysis was conducted using STATA version 15, with logistic regression identifying factors influencing hypertension. The study found an overall hypertension prevalence of 30.3%, with 9.09% representing newly diagnosed cases, consistent with trends in African populations. Significant sociodemographic factors included older age, lower education levels, urban residence, and marital status, with higher prevalence among married and widowed individuals. Key lifestyle contributors were high saturated fat intake, low physical activity, and excessive salt consumption, while regular exercise and a balanced diet were protective factors. The study concludes that hypertension is a prevalent

health issue among young adults in Karongi District, driven by both sociodemographic and lifestyle factors. It underscores the need for data-driven strategies for hypertension management and control, providing essential insights for health planners in estimating disease burden and designing targeted interventions. Recommendations include public awareness campaigns, early detection initiatives, and policy measures addressing unhealthy dietary habits and physical inactivity. Further research is encouraged to examine the impact of occupation, gender, marital transitions, and intervention efficacy in reducing hypertension prevalence. These efforts aim to mitigate the burden of hypertension in Rwanda, contributing to improved health outcomes and population well-being.

Keywords: *Hypertension, Prevalence, Risk factors, Lifestyle interventions, Sociodemographic factors, Management strategies*

1.0 Introduction

Hypertension is a leading global health concern, contributing significantly to morbidity and mortality worldwide. In sub-Saharan Africa, the growing burden of hypertension presents a critical challenge for health systems, with young adults increasingly affected. Despite its significance, limited epidemiological data exist on the prevalence and risk factors of hypertension in Rwanda, particularly among young adults aged 18–45 years. This study focuses on Karongi District, aiming to bridge this gap by identifying the sociodemographic and lifestyle factors influencing hypertension. By addressing this knowledge gap, the study seeks to inform effective prevention and management strategies, including public awareness and policy initiatives. Employing a cross-sectional design, data were collected using patient questionnaires and observation checklists, analyzed through logistic regression. The findings aim to provide actionable insights to mitigate the hypertension burden in Rwanda, supporting improved population health outcomes.

2.0 Material and methods Study Design

This study utilized a cross-sectional design to investigate the prevalence and associated risk factors of hypertension among young adults aged 18–45 years. Data were collected through participant interviews and direct blood pressure (BP) measurements. The combination of interviews and objective measurements enabled the simultaneous collection of self-reported behavioral and sociodemographic data (e.g., diet, exercise, education) alongside health indicators. This approach follows established epidemiological best practices for analyzing complex health conditions like hypertension.

Study Population

The study population comprised young adults aged 18–45 years attending Rubengera Health Center in Karongi District.

Sample Design

The sample size calculation will follow the WHO STEP-wise approach to non- communicable disease risk factor surveillance, utilizing the formula $N = Z^2 P (1-P)/e^2$, where:

N represents the sample size,

Z denotes the degree of confidence,

P indicates the baseline level of the selected indicator, and e signifies the margin of error (Iverson & Dervan, n.d.). $N= Z^2P(1-P)\ e^2$

$N= (1.96)^2 \times 0.263\ (1-0.263)/0.05^2$

$N= 3.8416 \times 0.263\ -0.01924/0.05^2$

$N= 3.8416 \times 0.193831/\ 0.05^2$

N= 297.8

Thus N= 297

Sampling Technique

Participants were recruited consecutively from eligible patients presenting at Rubengera Health Center. Those who consented to participate received a formal explanation of the study objectives and were informed of their right to withdraw at any time without penalty.

Data Collection Methods

Instruments

Data were collected in September 2024 using a structured interviewer-administered questionnaire tailored to the study objectives. Blood pressure was measured following the STEP- by- step guidelines, utilizing the OMRON M4 digital automatic blood pressure monitor. Three BP readings were taken for each participant at 2–3-minute intervals, with the second and third readings averaged for analysis.

Procedures

A trained research assistant facilitated data collection, including administering the questionnaire and conducting BP measurements. Data collection sheets were pre- prepared and completed based on collected data.

Validity and Reliability

To ensure the reliability and cultural relevance of the instruments, a pilot study was conducted at Rubengera Health Center with 30 participants who shared characteristics with the target population. Feedback from the pilot study informed adjustments to improve clarity, reliability, and validity. The finalized tools were pre-tested, approved, and deemed suitable for the main study.

Data Analysis

Data were analyzed using STATA version 15. Descriptive statistics, including frequencies and percentages, were computed with a 95% confidence interval and a 5% margin of error. Bivariable logistic regression was employed to calculate crude odds ratios, while multivariate logistic regression adjusted for potential confounders. Results were presented to identify significant factors influencing hypertension prevalence.

4.0 Findings

Of the 297 respondents, 90 individuals (30.3%) were identified as having hypertension, while the remaining 207 individuals (69.7%) had normal blood pressure. This indicates that nearly one-third of the population is affected by hypertension, highlighting its significant burden among young

adults in Karongi District. Additionally, 7.74% of respondents exhibited elevated blood pressure, an early stage of hypertension risk, and 1.35% had raised blood pressure, suggesting the need for immediate intervention to prevent complications. Notably, 21.21% of the respondents were undergoing treatment for hypertension.

Sociodemographic and Lifestyle Factors

Bivariate analysis revealed strong associations between hypertension and sociodemographic factors such as older age, lower education levels, urban residence, and being widowed or separated. Education emerged as a protective factor, while urban living and certain marital statuses significantly increased the risk of hypertension. Although females and students had lower odds of hypertension, these associations were not consistently statistically significant.

Behavioral Risk Factors

Smoking Habits:

Smokers consuming one or fewer cigarettes daily had a hypertension prevalence of 75%, compared to 29.31% among non-smokers. However, the odds ratio (OR = 1.5, P>|z| = 0.81) for smokers was not statistically significant, and the odds for non-smokers were relatively high (OR = 7.24, P>|z| = 0.089). This suggests that other factors may contribute more significantly to hypertension than smoking in this population.

Alcohol Consumption:

- Among individuals consuming one or fewer alcoholic drinks daily, the prevalence of hypertension was 50%.
- Non-drinkers showed a much lower prevalence of hypertension (16.56%) with a statistically significant odds ratio (OR = 5.04, P>|z| = 0). This indicates that abstinence from alcohol is protective against hypertension.

Saturated Fat Intake:

- Frequent consumption of saturated fats was associated with a significant risk of hypertension (11.11%, OR = 32.00, P>|z| = 0.044), despite a wide confidence interval suggesting uncertainty.
- Conversely, individuals who rarely consumed saturated fats exhibited a higher prevalence of hypertension (40.65%) but had a statistically significant lower odds ratio (OR = 0.19, P>|z| = 0.002), demonstrating a protective effect.

Physical Activity:

- Individuals exercising more than three times a week had the lowest prevalence of hypertension (6.38%) and a highly significant protective effect (OR = 13.2, P>|z| = 0).
- Conversely, those who did not exercise at all had the highest prevalence (68.12%) with a statistically significant risk factor (OR = 0.42, P>|z| = 0.02).

Salt Intake:

Rare consumption of high salt was associated with a lower prevalence of hypertension (26.46%) and a significantly lower odds ratio (OR = 3.40, P>|z| = 0), emphasizing the protective role of reduced salt intake.

Key Findings and Implications

Behavioral factors such as physical inactivity, high salt and saturated fat intake, and alcohol consumption showed significant associations with hypertension, underscoring the importance of lifestyle modifications.

The findings highlight the need for targeted interventions, including promoting physical activity, healthy dietary practices, and reduced alcohol consumption, to mitigate hypertension risk. Urban living and sociodemographic characteristics such as education and marital status also emerged as critical determinants, indicating a need for tailored community-specific strategies. These results underscore the multifaceted nature of hypertension risk, combining behavioral, demographic, and lifestyle factors, and provide valuable insights for designing evidence-based interventions to address the burden of hypertension in young adults in Rwanda.

4.1 Discussion

This study results obtained from hypertension measurements at Rubengera health center that revealed an overall prevalence of 30.3% among young adult aged between 18-45 years among which 7.74% are for Elevated blood pressure, 1.35% are for raised blood pressure constructing 9.09% of new cases and a significant portion of 21.21% is currently on treatment. These prevalence percentages found are slightly above to those estimates in 2010 by WHO to be 22% of adults aged 18 years and above and similar to those from to a systematic analysis conducted in 2014 that showed that prevalence of hypertension was increased from 19.7% in 1990 to 30.8% in 2010 in Africa (Nahimana et al., 2018). The prevalence of new cases in this study of 9.09% is nearly similar to that of about 9% of the subjects examined have abnormal BP values performed in screening of the local population living in the rural area of the District of Nyaruguru in Rwanda (Muggli, 2021).

The analysis indicates that several factors are significantly associated with hypertension. Notably, age, education, consumption of high saturated fats and salt intake show strong associations with positively correlation with hypertension in addition to marital status showing that single individuals are less hypertensive compared to married individuals with an increase among widowed individuals and separated. The associations between hypertension and other factors like physical exercise and cigarette smoking show less clear patterns, possibly due to small sample sizes or other confounding factors, this suggests that while some lifestyle factors are important, hypertension is likely influenced by a complex interplay of variables that requires further investigation, these results show some similarities with the 2017 population-based national estimate of the prevalence and risk factors associated with hypertension in Rwanda that showed that high prevalence was observed among the less educated and respondents who were not in union with their spouses (Muggli, 2021). Additionally, Excess fat intake is associated with increased obesity which is strongly associated with Hypertension development (Al-Shami et al., 2023).

5.0 Conclusion

The study found a high prevalence of hypertension among young adult attending Rubengera Health Center in Karongi district Rwanda. The key sociodemographic factors identified to be associated with hypertension include older age, urban residence, and marital status, especially being married or widowed. Lower education levels increase the risk, while higher education offers protection. Although self-employment is linked to higher hypertension odds, the role of occupation and sex appears less significant, requiring further research to confirm their impact. The Major lifestyle contributors to hypertension include alcohol consumption, frequent intake of high-saturated fat

foods, low physical activity, and high salt consumption. Regular exercise, along with reducing saturated fat and salt intake, are protective behaviors against hypertension.

6.0 Acknowledgments

I extend my heartfelt gratitude to the Almighty for granting me the opportunity to achieve this milestone. I sincerely thank the administration of MKU, particularly the School of Health Sciences and the Department of Public Health, for their invaluable support and contributions to this endeavor.

I am deeply grateful to Dr. Ogendi Japhets for his guidance and unwavering support throughout this research project. His dedication and assistance were instrumental to its success.

I also appreciate the administration and clinical staff of Rubengera Health Center for their cooperation and assistance in facilitating this study.

Finally, I am profoundly thankful to everyone who contributed to my academic journey and the successful completion of this research.

Disclosure

This study identified a hypertension prevalence of 30.3% among young adults in Karongi District, highlighting its significant burden within this population. Key sociodemographic factors such as older age, lower education levels, urban residence, and certain marital statuses were strongly associated with higher odds of hypertension, emphasizing the role of contextual and demographic influences. Behavioral factors, including physical inactivity, high salt and saturated fat intake, and alcohol consumption, were significantly associated with hypertension, while reduced salt and saturated fat consumption, regular exercise, and abstinence from alcohol emerged as protective factors.

These findings underscore the complex interplay between lifestyle, sociodemographic, and behavioral factors in determining hypertension risk. This evidence provides a foundation for targeted interventions, promoting healthy living and community-specific strategies to reduce the burden of hypertension among young adults in Rwanda. The authors declare no financial or other conflicts of interest related to this study. All efforts were made to ensure the objectivity and integrity of the research.

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Table 1 Prevalence of hypertension among aged 18 - 45 years old presenting for care at Rubengera Health Center

This table presents the prevalence of hypertension among a sample of 297 respondents involved in the study. The prevalence helps to determine the proportion of young adults suffering from hypertension during the study period at Rubengera Health Center in Karongi district.

Hypertension prevalence

Variable	Frequency	Percent
Normal	207	69.7
Hypertension	90	30.3
Total	297	100

Source: Primary data

Notes:

Table 2 shows that out of the total 297 respondents, 90 individuals (30.3%) were identified as having hypertension. The remaining 207 individuals (69.7%) were classified as having normal blood pressure. This indicates that nearly one-third of the population is affected by high blood pressure. This suggests that hypertension is a significant health issue within this group.

Table 3 Prevalence of hypertension among aged 18 - 45 years old presenting for care at Rubengera Health Center considering the blood pressure classification

This analysis presents the distribution of blood pressure classifications among 297 respondents, highlighting the prevalence of normal blood pressure, elevated blood pressure, raised blood pressure, and those currently on hypertension treatment.

Blood pressure classification

Variables	Frequency(n)	Percent (%)
Normal	207	69.7
Elevated	23	7.74
Raised	4	1.35
Current on treatment	63	21.21
Total	297	100

Source: Primary data (2024)

Notes:

Table 3 illustrate that majority of the sample, 69.7%, have normal blood pressure, indicating that most individuals in this population maintain healthy blood pressure levels. Elevated blood pressure, which affects 7.74% of the respondents, signals an early stage where blood pressure is higher than normal but not yet in the hypertensive range. Individuals in this category are at an increased risk of developing hypertension if no preventive measures are taken. This group represents a critical target for lifestyle interventions to prevent the progression to full-blown

hypertension. Raised blood pressure is present in 1.35% of the respondents, indicating a small proportion of the population is already in a stage where their blood pressure is significantly above the normal range. Although this is a relatively low percentage, it represents those who may be at immediate risk for hypertension-related complications and likely require more intensive monitoring and management. A significant portion of the population, 21.21%, is currently on treatment for hypertension among young adults in the region.

Table 4 Bivariable analysis of sociodemographic factors associated with hypertension among young adults aged between 18 – 45 years

This table presents a bivariable analysis of various demographic factors and their association with hypertension.

		Frequency/mean		Bivariable analysis			
		yes	no	**P>z**	**Odds Ratio**	**[95% Conf.**	**Interval]**
Age	18 – 22	1(1.89%)	52(98.11%)	Reference			
	23- 27	2(4.26%)	45(95.74%)	0.5	2.311108	0.2027725	26.34093
	28- 32	11(17.74%)	51(82.26%)	0.023	11.21567	1.396649	90.06648
	33- 37	11(26.19%)	31(73.81%)	0.006	18.45158	2.271142	149.9074
	38- 42	25(47.17%)	28(52.83%)	0	46.4285	5.971607	360.9758
	43-45	17(42.5%)	23(57.5%)	0.001	38.43472	4.8226	306.3136
Education	Did not attend to school	7(63.64%)	4(36.36%)	Reference			
	Primary school	28(23.14%)	93(76.86%)	0.008	0.172043	0.0469297	0.6307053
	Secondary school	28(20.59%)	108(79.41%)	0.004	0.1481482	0.0405011	0.5419084
	University	3(10.71%)	25(89.29%)	0.002	0.0685714	0.0123329	0.3812585
Residence	Rural	30(14.22%)	181(85.78%)	Reference			
	Urban	37(43.02%)	49(56.98%)	<0.001	4.555782	2.561629	8.102325
Marital status	Single	4(4.44%)	86(95.56%)	Reference			
	Married	47(26.4%)	131(73.6%)	0	7.71374	2.68197	22.18585
	Widow	4(80%)	1(20%)	0	86	7.726109	957.2736
	Divorced	2(66.67%)	1(33.33%)	0.005	43	3.189333	579.745
	Separated	10(47.62%)	11(52.38%)	0	19.54545	5.229198	73.0561
Sex of respondent	Male	52(25.12%)	155(74.88%)	Reference			
	Female	15(16.67%)	75(83.33%)	0.112	0.5961539	0.315241	1.12739

https://doi.org/10.53819/81018102t4310

occupation of respondent	Employee	9(25%)	27(75%)	Reference			
	Self-employed	26(32.1%)	55(67.9%)	0.44	1.418182	0.5841576	3.442974
	Farmer	20(16.95%)	98(83.05%)	0.282	0.6122449	0.2502586	1.497826
	Housewife	11(45.83%)	13(54.17%)	0.097	2.538462	0.8435136	7.639221
	Student	1(2.63%)	37(97.37%)	0.02	0.0810811	0.0096866	0.6786858

Source: Primary data

Notes:

As presented in Table 4.4 results from a bivariate analysis reveals a strong association between older age, lower education levels, urban residence, and being widowed or separated with higher odds of hypertension taking a look on their Odds Ration and P >z values that are statistically significant. While females and students appear to have lower odds of hypertension, these associations are not always statistically significant. Education seems to be a protective factor against hypertension, while urban living and certain marital statuses significantly increase the risk.

Table 5 Bivariable analysis of risk factors associated with hypertension among young adults aged between 18 – 45 years

This Table 4.5 explores the relationship between lifestyle factors—such as smoking, alcohol consumption, saturated fat intake, physical exercise, and salt intake—and the prevalence of hypertension, as measured by odds ratios and their statistical significance.

		Frequency/mean/Percentage		Bivariable analysis			
		yes	no	Odds Ratio	P>|z|	95% Conf. Interval	
How many cigarettes do you smoke per day?	1 or less per day	3(75.00 %)	1(25.00 %)	1.5	0.81	0.05537	40.6328
	2-5 per day	2(66.67%)	1(33.33%)				
	6-10 per day						
	11 and more per day						
	Do not smoke	85(29.31 %)	205(70.69)	7.235294	0.089	0.74209	70.5431
How often do you drink alcohol per day?	1 or less per day	58(50.00 %)	58(50.00 %)	2.6	0.087	0.87091	7.76204
	2-5 per day	5 (27.78%)	13(72.22%)				
	6-10 per day						
	11 and more per day						
	Do not drink	27(16.56 %)	136(83.44%)	5.037037	0	2.90483	8.73432
How much time do you take food with high saturated fats?	Sometimes	39(23.64 %)	126(76.36%)				
	Often	1(11.11%)	8(88.89%)	2.47619	0.4	0.30031	20.4171
	Rarely	50(40.65%)	73(59.35%)	0.4519048	0.002	0.27181	0.75133
How much time do you take physical exercise per week?(defined as 150 minutes of moderate-intensity activity per week, or equivalent)	Once	27(47.37 %)	30(52.63%)				
	Twice	10(20.00 %)	40(80.00%)	3.6	0.004	1.51379	8.5613
	Thrice	0(0.00 %)	27(100.00 %)	1			
	More than three times	6(6.38 %)	88(93.62 %)	13.2	0	4.96978	35.0599
	None	47(68.12%)	22(31.88%)	0.4212766	0.02	0.20389	0.87045
How much time do you take food with higher salt?(<5 grams recommended by WHO)	Sometimes	22(55.00 %)	18(45.00%)				
	Often						
	Rarely	68(26.46 %)	189(73.54%)	3.397059	0	1.71792	6.71742

Source: Primary data (2024)

https://doi.org/10.53819/81018102t4310

Notes:

The analysis of smoking Habits and Hypertension indicates that individuals who smoke 1 or fewer cigarettes daily have a high percentage of hypertension (75%) compared to those who do not (25%). However, the odds ratio (OR = 1.5) is not statistically significant (P>|z|

= 0.81), indicating a weak association with hypertension and for non- smokers, the prevalence of hypertension is much lower (29.31%), yet their odds of hypertension are relatively high (OR = 7.24) compared to the reference group, though this result is not statistically significant (P>|z| = 0.089). This might suggest that other factors besides smoking could contribute to hypertension in this group.

The analysis of alcohol Consumption and Hypertension in this group shows that individuals who drink 1 or fewer alcoholic drinks daily have an equal prevalence of hypertension and no hypertension (50%). The odds ratio (OR = 2.6) suggests a potential but not statistically significant risk factor for hypertension (P>|z| = 0.087) and for non- drinkers show a lower prevalence of hypertension (16.56%) with a significantly high odds ratio (OR = 5.04, P>|z| = 0), indicating that abstaining from alcohol could be protective against hypertension.

Analysis of the relationship of saturated Fat Intake and Hypertension reveals that only 11.11% of individuals who often consume saturated fats have hypertension. Although the odds ratio (OR = 2.48) suggests a possible risk, it is not statistically significant (P>|z| = 0.4) whereas among those who rarely consume high saturated fats, the prevalence of hypertension is higher (40.65%), but they have a statistically significant lower odds ratio

(OR = 0.45, P>|z| = 0.002), suggesting that rare consumption of saturated fats is associated with a reduced risk of hypertension.

The analysis of physical exercise and Hypertension in this group shows that individuals exercising more than three times a week have the lowest prevalence of hypertension (6.38%) with a highly significant odds ratio (OR = 13.2, P>|z| = 0), highlighting the protective effect of regular, intense physical activity and for those who do not exercise at all have the highest prevalence of hypertension (68.12%) but a statistically significant lower odds ratio (OR = 0.42, P>|z| = 0.02), suggesting that non-exercise is a significant risk factor. Taking a look on salt intake and Hypertension, data shows that individuals who rarely consume high salt show a lower prevalence of hypertension (26.46%), with a significantly lower odds ratio (OR = 3.40, P>|z| = 0), indicating that reduced salt intake is strongly protective against hypertension.

Table 6 Multivariable analysis of sociodemographic factors associated with hypertension among young adults aged between 18 – 45 years

The dataset explores the prevalence of hypertension across various demographic categories, including age, education, residence, marital status, gender, and occupation. The analysis includes both unadjusted frequencies and percentages as well as multivariable odds ratios to account for potential confounding factors.

https://doi.org/10.53819/81018102t4310

		Frequency/mean		Percentage/Std Dev		Multivariables analysis			
		yes	no	yes	no	Odds Ratio	P>z	[95% Conf.	Interval]
Age	18 – 22	1	52	1.89	98.11	Reference			
	23- 27	2	45	4.26	95.74	10.89209	0.033	1.208415	98.17619
	28- 32	11	51	17.74	82.26	1.926673	0.559	0.2131699	17.41365
	33- 37	11	31	26.19	73.81	1.329176	0.798	0.1506552	11.72685
	38- 42	25	28	47.17	52.83	1.855464	0.6	0.184096	18.70083
	43-45	17	23	42.5	57.5	2.321256	0.502	0.1983358	27.1672
Education	Did not attend to school	7	4	63.64	36.36	Reference			
	Primary school	28	93	23.14	76.86	2.427776	0.37	0.3495851	16.86026
	Secondary school	28	108	20.59	79.41	3.737215	0.256	0.3841841	36.35439
	University	3	25	10.71	89.29	3.304211	0.462	0.136809	79.80333
Residence	Rural	30	181	14.22	85.78	Reference			
	Urban	37	49	43.02	56.98	0.1166086	0.001	0.0335909	0.4047994
Marital status	Single	4	86	4.44	95.56	Reference			
	Married	47	131	26.4	73.6	0.3156273	0.211	0.0518089	1.922849
	Widow	4	1	80	20	0.0413679	0.06	0.001497	1.143168
	Divorced	2	1	66.67	33.33	0.0114756	0.029	0.000207	0.636194
	Separated	10	11	47.62	52.38	0.1497776	0.126	0.0131418	1.707015
Sex of respondent	Male	52	155	25.12	74.88	Reference			
	Female	15	75	16.67	83.33	0.4332968	0.19	0.1241131	1.512702
occupation of responde	Employee	9	27	25	75	Reference			
	Self-employed	26	55	32.1	67.9	0.7053922	0.717	0.1067511	4.661105
	Farmer	20	98	16.95	83.05	2.001674	0.526	0.2346681	17.0739
	Housewife	11	13	45.83	54.17	0.3585281	0.357	0.0403551	3.185281
	Student	1	37	2.63	97.37	33.27447	0.015	1.968523	562.4471

Notes:

The analysis of these data reveals that taking a look on the odds ratio in the age groups, there is a clear trend of increasing hypertension prevalence with age, although statistical significance varies

across age groups. These data also revealed that higher levels of education are generally associated with lower hypertension prevalence, although the statistical significance is limited. Regarding the relationship between the residence and hypertension, these data shows that rural residents have lower hypertension prevalence of 14.22%. This suggests that rural living may be associated with a lower risk of hypertension whereas Urban resident's hypertension prevalence is significantly higher at 43.02%. The odds ratio (OR = 0.12, P>z = 0.001) is statistically significant, indicating a strong association between urban living and hypertension. However, the odds ratio below 1 suggests that when adjusted for other factors, urban living might actually be associated with a lower risk of hypertension, possibly due to better healthcare access or other unmeasured factors.

The analysis of the relationship between marital status and hypertension shows that for single individuals that serve as the reference group with the lowest hypertension prevalence at 4.44% and for married individuals the prevalence increases to 26.4%. The odds ratio (OR = 0.32, P>z = 0.211) is not statistically significant, indicating no strong association between being married and hypertension but for widowed individuals a very high prevalence of 80% is observed, but the odds ratio (OR = 0.04, P>z = 0.06) is not statistically significant. The wide confidence interval suggests that this finding is likely influenced by the small sample size Whereas for divorced individuals with a prevalence of 66.67%, the odds ratio (OR = 0.01, P>z = 0.029) is statistically significant, suggesting a protective effect of being divorced on hypertension, and for separated individuals the prevalence is 47.62%, but the odds ratio (OR = 0.15, P>z = 0.126) is not statistically significant, suggesting no strong association.

The analysis of gender and Hypertension revealed that female respondents have a lower prevalence of 16.67%. The odds ratio (OR = 0.43, P>z = 0.19) is not statistically significant, indicating no strong evidence of gender differences in hypertension risk after adjusting for other factors The analysis of the relationship of the occupation and hypertension in this group shows that farmers have a lower prevalence of 16.95%. The odds ratio (OR = 2.00, P>z = 0.526) is not statistically significant, though there may be a trend towards a lower risk of hypertension associated with farming.

Abbreviations: BP, blood pressure; MKU, mount kenya university; OR, odds ratio.