Original Article

Knowledge, Attitude, and Practice towards Prevention of Hypertension among Pregnant Women Attending Antenatal Care Clinic at a District Hospital in Kigali City

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Abstract

Background
Hypertensive disorders during pregnancy (HDP) pose significant risks globally. Adequate knowledge of HDP aids in prevention. This study aimed to assess knowledge, attitude, and practice towards preventing hypertension among pregnant women attending antenatal care at Muhima District Hospital in Kigali city.

Methodology
Altogether, 384 pregnant women receiving antenatal care at Muhima Hospital were surveyed to obtain their knowledge, attitudes, and practices regarding hypertension prevention. A descriptive cross-section study was used; a bivariate and multivariate analysis with odds ratios (OR) and 95% confidence intervals were calculated to investigate associations with preventive practices.

Results
The participants' ages ranged from 18 to 45 with a mean of 32.4(SD±.838). Majority were in the age range of 32-38 years. 291 (75.8%) had low knowledge about preventing hypertension, and 226 (58.9%) had negative attitudes toward hypertension prevention among pregnant women. Additionally, 226(58.9%) exhibited low preventive practices. Multivariate logistic regression revealed that higher education (AOR=6.79; 95%CI: 2.02 – 22.93), third wealth category (AOR=3.34: 95%CI: 1.72 – 6.49), and higher knowledge (AOR=2.18: 95 %CI: 1.25 – 3.80) were associated with hypertension prevention practices.

Conclusion
These findings highlight the need for targeted education on hypertension prevention for pregnant women. Prioritizing educational programs can improve knowledge and proactive healthcare practices.

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Keywords: knowledge, attitude, practice, hypertension, prevention, and pregnant women

Introduction

Hypertension is characterized by systolic blood pressure readings of ≥ 140 mmHg and diastolic blood pressure readings of ≥ 90 mmHg on two separate days during pregnancy.[1] In the year 2021, more than 700 million individuals were reported to be living with hypertension.[2] The incidence of hypertension during pregnancy in developed countries ranges from 4 to 25 percent. [3] In low-income countries, the prevalence of hypertension during pregnancy is 16%.[4] In Africa, 1 in 10 pregnant women are diagnosed with high blood pressure, which is a major significant cause of maternal and perinatal deaths.[5] In Rwanda, the prevalence of hypertension is approximately 15.9% in 2022 but is projected to rise to 17.78 in the year 2025 if appropriate intervention strategies are not put in place to reduce the burden.[6]

In Rwanda, Hypertensive disorders in pregnancy are a significant public health concern as they pose risks to the well-being of both the mother and the developing fetus. [7] Studies that have addressed hypertension have focused on the knowledge and practices of district health care providers on pre-eclampsia and eclampsia,[8] neonatal outcomes from mothers with hypertension disorders of pregnancy [7] and knowledge, attitude, and practice towards risk factors of hypertension among patients attending outpatient services at a district hospital in Eastern Province of Rwanda.[9] Previous studies have shown a positive association between knowledge attitude and good practice regarding COVID-19 precautionary measures.[10] In Rwanda, no study has addressed, knowledge, attitude, and practice regarding preventing hypertension among pregnant women. This information is important as it could form context-based data for public health priority intervention in health education to mothers attending antenatal clinics and other similar populations. It will also be useful in delineating the factors that need to be specifically addressed in efforts aimed at reducing the burden of hypertension among women.

Methods

Study design
This study utilized a cross-sectional design with a quantitative approach, relying on primary data collected from pregnant women attending the ANC clinic at Muhima District Hospital from July 31, 2023, to August 31, 2023.

Study setting
Muhima District Hospital is a public healthcare facility situated in the Nyarugenge district of Kigali City, Rwanda. It serves as a crucial centre for maternal and child health services within the region.

Study population and sample
The study population of pregnant women who were attending antenatal care at Muhima Hospital Antenatal Care Clinic during the period from July 31, 2023, through to August 31, 2023, were interviewed. Muhima District Hospital is a public hospital located in Nyarugenge district, Kigali City, Rwanda, serving a catchment population of over 318,581 individuals.[11] To conduct a study at this hospital, a sample size of 384 participants was determined using Fisher's formula, ensuring a representative sample of the population.[12] During the determination of sample size, there was no actual prevalence known, however, certain books or guidelines recommended using an expected prevalence of 50%.[13,14]
In this formula, sample size, n was

$$n = \frac{Z^2 P(1-P)}{d^2}$$

Where n=the sample size;
 Z=statistic for a level of confidence and was 1.96 for a confidence limit of 95%
P=the population proportion and was taken to be 50%, [13,15] and
d= the degree of desired precision or margin of error was 0.05 in this study.

$$n = \frac{1.96^2\ 0.5(1-0.5)}{0.05^2} = 384.1 = 384 \text{ participants.}$$

Muhima District Hospital was purposively selected because of its high volume of pregnant women obtaining ANC making it an appropriate location for the study.

Data Collection tool

The instrument for data collection was a self-administered questionnaire. The questionnaire was borrowed from previous studies.[16,17] The questionnaire has also been used in other similar studies.[18] The questionnaire comprised four sections. Section A focused on the Socio-demographic characteristics of the participants which were composed of 5 questions which were age, marital status, religion, and education level and wealth category. Section B spoke to knowledge toward the prevention of hypertension among pregnant women was contained 12 open-ended questions where respondents were provided a place of ticking yes or no. Section C was about the attitude toward the prevention of hypertension among pregnant women and had 11 questions, this was assessed using a 5-point Likert Scale: Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree. Section D addressed the information on practice toward prevention of hypertension among pregnant women and it was 13 questions, and respondents were provided a place of ticking yes or no. The independent variable consisted of knowledge and attitude toward the prevention of hypertension among pregnant women attending antenatal care clinics. The dependent variable contained practice toward the prevention of hypertension among pregnant women attending antenatal care clinics.

Data correction procedure

The data collection procedure began with piloting the questionnaire on 38 women attending the ANC clinic at a neighbouring health facility, Kibagabaga Hospital. This preliminary testing aimed to refine the instrument and ensure its clarity and effectiveness. The final data collection tool was a self-administered questionnaire, designed to gather comprehensive and accurate information from the participants. This pilot study helped identify any issues or ambiguities in the questionnaire, allowing for necessary adjustments before its deployment in the main study at Muhima District Hospital.

Data management and analysis

Codes were created from the questionnaire responses for use during data entry. Data was checked for consistency and all entries were counterchecked. The data collected from the survey was analyzed using the Statistical Package for Social Scientists (SPSS), Version 21 software. This powerful tool enabled comprehensive statistical analysis, facilitating the interpretation of complex data sets.[19] By leveraging SPSS, we were able to conduct various statistical tests, including descriptive statistics, bivariate analysis, and multivariate logistic regression analysis.

To determine the level of knowledge, the overall score was calculated by summing up the scores for each respondent across all item questions that addressed knowledge. Twelve (12) questions aimed to assess the level of knowledge. Thus were evaluated by using the Statistical Package for Social Science (SPSS) score assessment. If a participant gave a correct answer, they received a score of one (1), whereas an incorrect response was assigned a score of zero (0). The overall score was calculated by adding up the scores for each respondent across all 12 questions. The smallest score was 12 while the higher score was 24, and the mean was 15.4. However, the value that was below the mean was taken as low knowledge while the values above the mean were taken as high knowledge. Similarly, the level of attitude was determined by summing up the scores for each respondent across all eleven-item questions that spoke to attitude. The lowest score was 11 while the highest score was 36, and the mean was 22.9. However, any score below the mean score was considered a negative attitude; scores above the mean were considered a positive attitude. Finally, the practice was assessed based on responses to thirteen-item questions that spoke to practices related to the prevention of hypertension among pregnant women. The highest attainable score was 24, the lowest was 13, and the average score was 18.6. The above scores were used in similar studies.[9,20]

In this subsection, a correct answer to an item questionnaire was assigned a score of 1; an incorrect response was assigned a score of 0. Bivariate and multivariate logistic regression analyses were conducted to assess the significance of various factors in the prevention of hypertension among pregnant women. Multivariate logistic regression analysis was specifically employed to evaluate the impact of multiple variables simultaneously, with the odds ratio (OR) calculated at 95% confidence intervals to determine the strength of associations. Statistical significance was established with a p-value threshold of less than 0.05, ensuring that only factors with strong evidence of association were considered significant. This rigorous statistical approach enabled a comprehensive understanding of the determinants influencing hypertension prevention in the study population.

Ethical consideration

The study was reviewed and approved by the Mount Kenya University Ethical Review Committee (MKU/ETHICS/24/8/2023) following authorization from Muhima District Hospital.

Participants were informed of their right to participate voluntarily and to withdraw at any time without any repercussions. Throughout the study, all data was kept confidential, privacy was strictly maintained, and the identities of participants remained anonymous to ensure their protection and uphold ethical standards. Before conducting interviews, all respondents provided informed consent after receiving comprehensive information about the study.

Results

Demographic Characteristics of Respondents

This section presents the demographic characteristics of respondents whose ages ranged from 18 to 45 years with a mean age of 32.4(SD±0.838).

The majority of respondents, 56.5% (217), were in the ages range from 32 to 38 years. Those aged 39-45 comprised the least proportion, 12% (46). The overwhelming majority, 96.4% (370) were married. Christian 91.7% (352); slightly more than half 55.2% (212) had attained primary level of education school. The wealth category was reported as follows: Category I, 38% (146); category II, 46.1% (177); category III, 15.9% (61). (Figure 1)
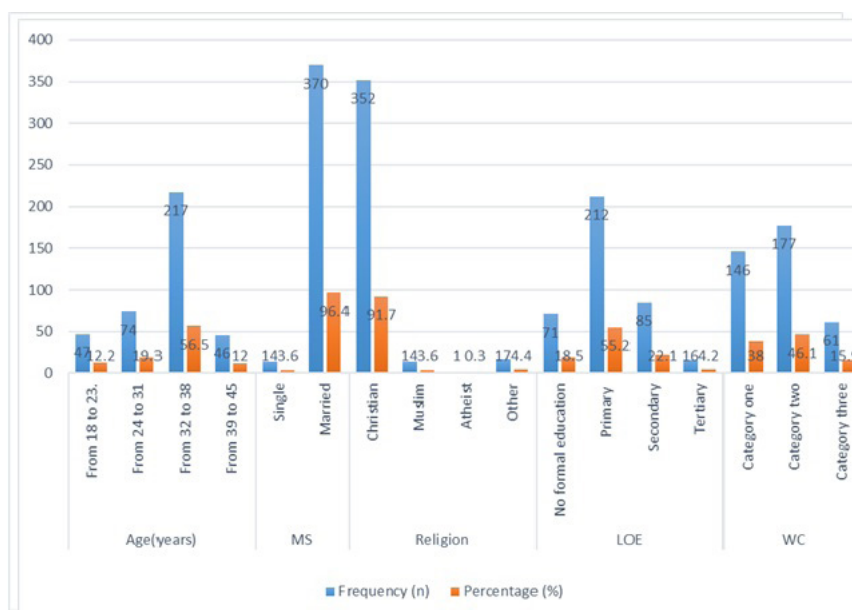
Where; MS: Marital status; LOE: Level of Education and; WC: Wealth Category

Figure 1. Socio-demographic characteristics of respondents, antenatal clinic attendees, Muhima District Hospital, July-August 2023; n=384

Knowledge about the prevention of hypertension among pregnant women

This section of the findings presents the responses of pregnant women concerning their knowledge of hypertension prevention during pregnancy. A total of 295 participants (76%) responded that a woman during pregnancy is at higher risk of experiencing hypertension compared to women who are not pregnant. The majority of participants responded that vegetables play a crucial role in safeguarding against hypertension during pregnancy: 363(94.5%). In total, 269 respondents (70%) knew that fruits are beneficial in the prevention of hypertension during pregnancy. About three-quarters (73.2%) responded that consuming fatty foods can contribute to hypertension during pregnancy among pregnant women. 311 respondents (80.0%) indicated that excessive salt consumption can lead to hypertension during pregnancy.

The findings of this study indicate that tobacco use is a cause of hypertension during pregnancy with 189 (49.2%). A majority of respondents, specifically 75.8% (291), knew that pregnant women must engage in physical activities to prevent hypertension. 52.3% (201) of respondents indicated that limiting or avoiding the consumption of caffeine during pregnancy helps prevent hypertension. A significant majority, specifically 85.7% (329), responded that limiting alcohol consumption during pregnancy prevents hypertension. Approximately 78.6% (302) of respondents knew that maintaining weight might prevent hypertension during pregnancy. Exactly 272 (70.8%) of pregnant women responded that regular antenatal visits may prevent hypertension during pregnancy. Only 44% (169) of pregnant women acknowledged that stress and emotional well-being affect the risk of developing hypertensive disorders during pregnancy. (Table 1).

Table 1. Responses of pregnant women about Knowledge of the prevention of hypertension at Muhima Hospital, July-August 2023; n=384

Question	Response	Frequency (n)	Percentage (%)
A pregnant woman is at a higher risk of developing hypertension compared to non-pregnant women	Yes	295	76.8
	No	89	23.2
Vegetables play a crucial role in safeguarding against hypertension during pregnancy.	Yes	363	94.5
	No	21	5.5
Fruits are beneficial in the prevention of hypertension during pregnancy.	Yes	269	70.1
	No	115	29.9
It is known that consuming fatty foods such as butter and margarine, processed meats, and fried chicken can contribute to hypertension during pregnancy among pregnant women	Yes	281	73.2
	No	103	26.8
Excessive salt consumption can lead to hypertension during pregnancy.	Yes	311	81.0
	No	73	19.0
It is widely recognized that tobacco use can cause hypertension during pregnancy.	Yes	189	49.2
	No	195	50.8
It is known that pregnant women must do some physical activities to prevent hypertension.	Yes	291	75.8
	No	93	24.2
It is advisable to limit or avoid the consumption of caffeine during pregnancy to prevent hypertension	Yes	201	52.3
	No	183	47.7
It is recommended to limit alcohol consumption during pregnancy to prevent hypertension.	Yes	329	85.7
	No	55	14.3
Maintaining weight may prevent hypertension during pregnancy.	Yes	302	78.6
	No	82	21.4
Regular antenatal visits may prevent hypertension during pregnancy.	Yes	272	70.8
	No	112	29.2
Can stress and emotional well-being affect the risk of developing hypertension during pregnancy?	Yes	169	44.0
	No	215	56.0

Attitude towards the prevention of hypertension among pregnant women attending antenatal clinics at Muhima District Hospital

This research determined attitudes toward the prevention of hypertension among pregnant women attending antenatal clinics at Muhima District Hospital. On Avoidance of Fatty Foods, respondents the respondents; 198 (51.6%), strongly agreed that avoiding fatty foods can help prevent hypertension. An additional 110(28.6%) agreed, 37 (9.6%) were neutral, 35 (9.1%) disagreed, and 4 (1.0%) strongly disagreed. The mean score was 1.79.

Regarding avoidance of Salty Foods preventing hypertension during pregnancy, respondents responded that 209 (54.4%) strongly agreed that avoiding salty foods is important for preventing hypertension, and 117 (30.5%) agreed. There were 22 (5.7%) who were neutral, 13 (3.4%) who disagreed, and 23 (6.0%) who strongly disagreed. The mean score was 1.76, reflecting even stronger agreement than for fatty foods.

About refraining from Smoking during Pregnancy: The highest level of agreement was seen here, with 270 (70.3%) strongly agreeing that quitting smoking is crucial during pregnancy to prevent hypertension. Additionally, 77 (20.1%) agreed, 3 (0.8%) were neutral, 23 (6.0%) disagreed, and 11 (2.9%) strongly disagreed. The mean score was 1.51.

Avoidance of Alcoholism during Pregnancy: A total of 229 (59.6%) strongly agreed that avoiding alcohol is important to prevent hypertension during pregnancy, while 91 (23.7%) agreed, 10 (2.6%) were neutral, 38 (9.9%) disagreed, and 16 (4.2%) strongly disagreed. The mean score was 1.75, indicating strong agreement.

Exercise and Regular Walks: There was strong agreement that regular physical activity is crucial, with 206 women (53.6%) strongly agreed and 146 (38.0%) agreed. Meanwhile, 22 (5.7%) were neutral, 6 (1.6%) disagreed, and 4 (1.0%) strongly disagreed. The mean score was 1.58, showing substantial support for this practice.

Stress Management Techniques that Prevent Hypertension during Pregnancy: Stress management was also strongly supported, with 197(51.3%) strongly agreed, 148 (38.5%) agreed, 14 (3.6%) was neutral, 17 (4.4%) disagreeing, and 8 (2.1%) strongly disagreed. The mean score was 1.67. Engaging in Activities like Knitting or Reading: while there was agreement that engaging in activities such as knitting or reading can help manage stress related to hypertension during pregnancy, the support was less strong compared to more direct health practices. Specifically, 172 pregnant women (44.8%) strongly agreed, 114 (29.7%) agreed, 73 (19.0%) were neutral, 11 (2.9%) disagreed, and 14 (3.6%) strongly disagreed. The mean score was 1.91.

Witchcraft Activities: Opinions were more varied regarding the belief that witchcraft activities cause hypertension in pregnancy. Only 87 (22.7%) strongly agreed and 51 (13.3%) agreed, whereas 78 (20.3%) were neutral, 57 (14.8%) disagreed, and 111 (28.9%) strongly disagreed. The mean score was 3.14.

Traditional Medication: There was considerable disagreement with the notion that traditional medication treats hypertension during pregnancy. Only 61(15.9%) strongly agreed and 36 (9.4%) agreed, while 81 (21.1%) were neutral, 84 (21.9%) disagreed, and 122 (31.8%) strongly disagreed. The mean score was 3.44.

Treatment by Qualified Health Professionals: There was strong agreement that hypertension during pregnancy should be treated by qualified health professionals, with 216 pregnant women (56.3%) strongly agreeing and 112 (29.2%) agreeing. There were 19 (4.9%) who were neutral, 26 (6.8%) who disagreed, and 11 (2.9%) who strongly disagreed. The mean score is 1.71.

Prayers: Opinions on the efficacy of prayers in preventing hypertension were mixed: 113 (29.4%) strongly agreed, 89 (23.3%) agreed, 73 (19.0%) were neutral, 31 (8.1%) disagreed, 78 (20.3%) strongly disagreed. The mean score was 2.67. (Table 2)

Table 2. Responses on attitude toward the prevention of hypertension among pregnant women, July-August 2023; n=384

Item	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree	Mean
	n (%)	n (%)	n (%)	n (%)	n (%)	
It is advisable to avoid consuming fatty foods to prevent hypertension.	198 (51.6)	110 (28.6)	37 (9.6)	35 (9.1)	4(1.0)	**1.79**
It is advisable to avoid consuming salty foods to prevent hypertension.	209 (54.4)	117 (30.5)	22 (5.7)	13 (3.4)	23 (6.0)	**1.76**
During pregnancy, it is recommended to refrain from habits such as smoking to prevent hypertension.	270 (70.3)	77 (20.1)	3 (0.8)	23 (6.0)	11 (2.9)	**1.51**
It is advisable to avoid alcoholism and prevent hypertension during pregnancy	229 (59.6)	91 (23.7)	10 (2.6)	38 (9.9)	16 (4.2)	**1.75**
I believe exercise and engaging in regular walks at least 30 minutes per day are crucial for preventing hypertension during pregnancy.	206 (53.6)	146 (38.0)	22 (5.7)	6 (1.6)	4 (1.0)	**1.58**
Effective prevention of hypertension during pregnancy necessitates the implementation of stress management techniques, including practices that promote both mental and physical relaxation.	197 (51.3)	148 (38.5)	14 (3.6)	17 (4.4)	8 (2.1)	**1.67**
I believe that engaging in additional activities such as knitting or reading books can serve as a means of effectively managing the stress associated with hypertension during pregnancy.	172 (44.8)	114 (29.7)	73 (19)	11 (2.9)	14 (3.6)	**1.91**
Witchcraft activities cause hypertension in pregnancy.	87 (22.7)	51 (13.3)	78 (20.3)	57 (14.8)	111(28.9)	3.14
Hypertension during pregnancy is treated by traditional medication.	61 (15.9)	36 (9.4)	81 (21.1)	84 (21.9)	122 (31.8)	3.44
Hypertension during pregnancy is treated by a qualified health professional.	216 (56.3)	112 (29.2)	19 (4.9)	26 (6.8)	11 (2.9)	**1.71**
Prayers can be employed to prevent hypertension during pregnancy.	113 (29.4)	89 (23.3)	73 (19)	31 (8.1)	78 (20.3)	2.67

Note: n=385, SA=strongly agree, A= Agree, N=Neutral, D= disagree and SD=strongly disagree. The grand mean or the weighted average is 2.084.

The overall level of knowledge, attitude, and practice toward the prevention of hypertension among pregnant women

The overall findings of knowledge, attitude, and practice toward the prevention of hypertension among pregnant women at Muhima District Hospital was: 291(75.8%) had a low level of knowledge.

Respondents were likely to have a negative attitude was 226(58.9%). The respondents had a low level of practice 261(68.0%).
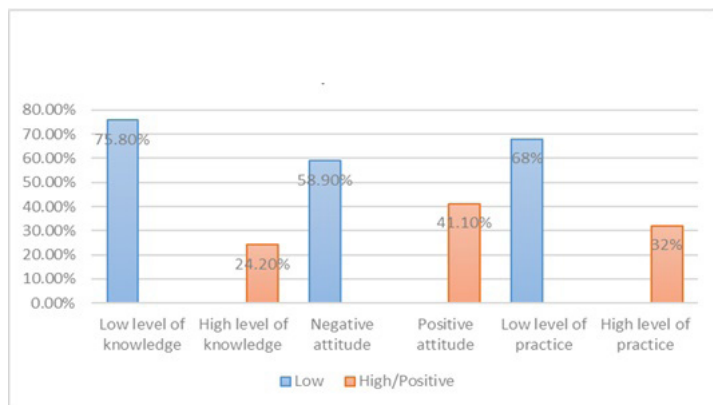
Figure 2. The overall level of knowledge, attitude, and practice toward the prevention of hypertension among pregnant women attending the ANC clinic at Muhima District Hospital

Bivariate analysis of factors associated with practice toward prevention of hypertension among pregnant women

The bivariate analysis conducted at Muhima District Hospital examines various factors associated with the practice toward the prevention of hypertension among pregnant women.

The analysis considers age, marital status, religion, education level, wealth category, level of knowledge, and attitude as variables influencing practice levels. Age distribution reveals varying levels of practice, with the highest practice observed among women aged 32-38 years (38% low practice, 18.5% high practice). Marital status shows no significant association with practice level. Religion demonstrates a significant difference, with Christians exhibiting higher practice levels compared to Muslims, Atheists, and others (60.4% vs. 2.9% low practice, 31.3% vs. 0.8% high practice, p = 0.002).

Education level and wealth category also exhibit significant associations, indicating that higher education levels and wealthier categories correlate with better practice levels (p = 0.011 for education, p = 0.004 for wealth). Additionally, higher levels of knowledge and a positive attitude are associated with improved practice toward hypertension prevention (p = 0.036 for knowledge, p = 0.037 for attitude).

Table 3. Bivariate analysis of factors associated with practice toward prevention of hypertension among pregnant women

Variables		level of practice toward the prevention of hypertension		Pearson Chi-square	P-value
		Low (%)	High (%)		
Age	From 18 to 24	37(9.6)	10(2.6)		
	From 25 to 31 years old	46(12)	28(7.3)		
	From 32 to 38 years old	146(38)	71(18.5)	0.034	0.508
	From 39 to 45 years Old	32(8.3)	14(3.6)		
Marital status	Married	251(65.4)	119 (31)		
	Never in the union, Widowed, Divorced, and Separated	10 (2.6)	1(0.3)	0.145	0.005
Religion	Christian	232(60.4)	120 (31.3)	-0.160	**0.002**
	Muslim, Atheist and others	11 (2.9)	3(0.8)		
The highest education level	No formal education	54 (14.1)	17(4.4)		
	The primary level of education	146 (38)	66 (17.2)	0.129	**0.011**
	Secondary level of education	54 (14.1)	31 (8.1)		
	Tertiary level	7 (1.8)	9 (2.3)		
Wealth category	1st category	106 (27.6)	40(10.4)		
	Second category	125(32.6)	52(13.5)	0.145	**0.004**
	Third category	30(7.8)	31(8.1)		
Level of Knowledge	High Knowledge	206(53.6)	85(22.1)	0.107	**0.036**
	Low Knowledge	55(14.3)	38(9.9)		
Level of attitude	Negative attitude	163 (42.4)	63(16.4)	0.107	**0.037**
	Positive attitude	98(25.5)	60(15.6)		

Multivariate logistic regression analysis on factors associated with practice toward prevention of hypertension among pregnant women

The multivariate logistic regression analysis conducted at Muhima District Hospital examines various factors associated with the practice toward the prevention of hypertension among pregnant women. Respondents with a high level of education were 7 times (AOR=6.79; 95%CI: 2.01-22.92; p=0.002) demonstrating a higher likelihood of having a high level of practice for preventing hypertension among pregnant women compared with participants with a low level of education. Findings indicated that the third category of wealth was 3 times (AOR=3.34; 95%CI: 1.72-6.49; p>0.001) likely to have a high level of practice toward the prevention of hypertension compared with the first and second categories of wealth. Moreover, those with a high level of knowledge showed that 2.18 times (AOR=2.18; 95 % CI; 1.25- 3.80; p=0.006) were more likely to have good practice than those with a low level of knowledge (Table 4).

Table 4. Multivariate logistic regression analysis on factors associated with practice toward prevention of hypertension among pregnant women n=384

Valuables	Crude OR (95%CI)	P-Value	Adjusted OR (95%CI)	P-Value
Marital status				
Never in the union, widowed, separated, and divorced	Ref.		Ref.	
Married	4.7(0.6-37.5)	0.140	5.4(0.6-50.8)	0.143
Religion				
Christian	Ref		Ref	
Muslim and others	0.5(0.1-1.9)	0.333	0.6(0.2-2.4)	0.495
The highest education level				
No formal education	Ref.		Ref.	
The primary level of education	1.4(0.8-2.7)	0.251	1.9(1-3.9)	0.680
Secondary level of education	1.8(0.9-3.7)	0.093	2.1(0.9-4.5)	0.690
Tertiary level	4.1(1.3-12.6)	0.015	6.8(2-22.9)	0.002
Wealth category				
1st category	Ref.		Ref.	
Second category	1.1(0.7-1.8)	0.695	1.1(0.6-1.8)	0.793
Third category	2.738 (1.5-5.0)	0.001	3.3(1.7-6.5)	> 0.001
Level of Knowledge				
High Knowledge	Ref.		Ref.	
Low Knowledge	1.7 (1.0-2.7)	0.037	2.2 (1.3-3.8)	0.006
Level of attitude				
Negative attitude	Ref.		Ref.	
Positive attitude	1.6 (1.0-2.4)	0.037	1.3 (0.8-2.1)	0.282

Discussion

The main objective of the study was to assess knowledge, attitude, and practice toward the prevention of hypertension among pregnant women at a Muhima District Hospital. In the current study, the overall level of knowledge shows that respondents have a low level of knowledge contrary to the study done in Scotland where the level of knowledge was high about the prevention of hypertension among pregnant women was about 52.2%.[21]

In our study, respondents responded that engaging in regular physical exercises prevents hypertension during pregnancy which is like studies done in Nigeria where 180 (67.4%) responded that physical exercises contribute to the prevention of hypertension during pregnancy.[18,22] Avoiding stress and emotional well-being prevent hypertension during pregnancy, this is also supported by the research done in Nigeria.[18] It has also been shown that several studies show that avoiding stress, attending antenatal care, and avoiding excess salt and sugar aid in prevention respectively among pregnant.[18,22,23] This shows the same findings in a study done in Ethiopia where the level of knowledge was low about 28.8%.[24] This shows that several studies present that most pregnant women have a low level of knowledge about the prevention of hypertension.

Regarding attitudes toward the prevention of hypertension among pregnant women, respondents reported that traditional healers or medication cannot prevent hypertension during pregnancy which was similar to several studies.[16,18,21,25] Our study reported that the majority of respondents had a negative attitude towards the prevention of hypertension during pregnancy, this is similar to a study done in Ethiopia shows that the majority of respondents had negative attitudes toward the prevention of hypertension (29.3 %).[24] A study done in Nigeria shows that studies are showing that most pregnant women have a positive attitude toward the prevention of hypertension during pregnancy (92.5%).[16,21]

Our study revealed that the practice toward hypertension prevention among pregnant women was low which is similar to some of what other studies have shown,[25–27] these were also supported by other studies where having a routine of daily exercises and taking a balanced diet with low salt. [2,22,28] Practices during the prevention of hypertension during pregnancy in Ghana results demonstrated limited adherence to preventive measures for hypertension among pregnant women, such as abstaining from fatty and salty foods, refraining from alcohol consumption, and smoking, and engaging in regular exercise.[21] Different from the study done in Brazil in 2022 which shows that pregnant women had a high level of practice toward the prevention of hypertension.[25]

Our study found that pregnant women in the category of wealth three were likely to have a high level of practice in the prevention of hypertension during pregnancy. A study done in Sweden has shown that social socioeconomic status and wealth category may trigger the practice of preventing hypertension during pregnancy.[29] This was supported by a study done in LAL Ded Hospital in LAL Chowk, Srinagar confirmed that low socioeconomic status may result in low practice in preventing hypertension during pregnancy.[30] This was also supported by the study done in Tanzania .[31]

Regarding education's role in hypertension prevention, evidence from China, Cameroon, Nigeria, and Ethiopia consistently supports the association between lower educational levels and increased risk of hypertension during pregnancy.[22,32–34] Notably, our study found that participants with higher education levels exhibited better practices toward hypertension prevention, echoing findings from previous research. Factors such as wealth category and knowledge level also influenced preventive practices, with higher wealth categories and greater knowledge associated with improved preventive behaviours. This was confirmed by the study done in China where education is associated with a low level of practice.[32] The current study showed that participants with a high level of education were 6.796 times more likely to have good practice toward the prevention of hypertension among pregnant women. The distinction is that our study reports a higher frequency compared to the study conducted in sub-Saharan Africa.[24,35,36]

Studies also show that Education had a significant influence on awareness of hypertension in pregnancy with a p-value <0.05.[18]

Furthermore, the effectiveness of educational interventions in improving knowledge and practices toward hypertension prevention during pregnancy has been demonstrated in various studies,[21,25] highlighting the potential for nurse-led educational programs to enhance healthcare support and quality. However, challenges such as inadequate knowledge persist, underscoring the ongoing need for targeted interventions to address gaps in understanding and promote healthier practices among pregnant women. Moreover, those with a high level of knowledge were demonstrated to be more likely to have a high level of practice compared with those with a low level of knowledge. This was also supported by the study where findings show inadequate knowledge as the main factor of hypertension prevention during pregnancy. [37] In contrast to this research, the educational program significantly improved the self-efficacy of pregnant women in the intervention group within one week and one month. Other studies have also pointed out the potential effectiveness of nurse-led educational practices based on KAP surveys in enhancing healthcare support and quality.[25,38]

Conclusion

The present findings highlight important concerns regarding knowledge, attitude, and practice towards the prevention of hypertension among pregnant women attending ANC services at a Muhima District Hospital. Most of them had low levels of knowledge, negative attitudes, and low practices toward the prevention of hypertension among pregnant women. Factors that were associated with low practice in the prevention of hypertension among pregnant women were low level of education, economic status, and low level of knowledge as evidenced by multivariate regression analysis.

The Ministry of Health and hospitals, along with stakeholders must reinforce awareness of the prevention of hypertension among pregnant women. Policymakers and healthcare providers should prioritise educational programs and accessible resources to improve knowledge and promote proactive healthcare practices among this vulnerable population.

Future research should focus on longitudinal studies to evaluate the effectiveness of educational interventions to improve knowledge, attitudes, and practices regarding hypertension prevention among pregnant women. Investigating the impact of socio-economic factors and educational status on the effectiveness of these interventions could provide more nuanced insights into the barriers faced by different subgroups.

Limitations of the Study
Depending on the sample size, there may be limitations in the statistical power to detect associations between variables. Small sample sizes can also affect the generalizability of the findings. The study was conducted at a single district hospital (Muhima District Hospital). The findings may not be generalizable to pregnant women in other regions or healthcare settings with different demographic and socio-economic profiles.

Authors' contribution
MHD was responsible for designing and executing the study and drafting the paper's initial version. JO and MH oversaw the project and provided feedback on the draft manuscript. All authors collaborated on revising the manuscript until its publication.

Conflict of interest
There are no competing conflicts of interest to disclose.

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