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Original research

Magnitude and associated factors of Pregnancy-Induced Hypertension Among Women Who Gave Birth in Public Hospitals of East Wollega Zone, Oromia, Ethiopia: A cross-sectional study

Chaltu File Teka[1*], Walkite Olani[2], Robsan Gudeta[2]

[1]*Department of Reproductive Health, Institute of Health Sciences, Wollega University, Nekemte, Ethiopia*

[2]*Department of Public Health, Institute of Health Sciences, Wollega University, Nekemte, Ethiopia*

Abstract

Background: *Pregnancy-induced hypertension represents a major health concern that typically develops after the twentieth week of gestation. It stands as the second leading contributor to maternal deaths, both direct and indirect.*

Objective: *To assess the magnitude and determinants of pregnancy-induced hypertension among mothers delivering in East Wallaga public hospitals, Oromia, Ethiopia.*

Methods: *A cross-sectional study was carried out in public hospitals of East Wallaga Zone between January 1 and May 30, 2023. Data were collected through face-to-face interviews and by reviewing maternal medical records with a semi-structured questionnaire. The collected information was entered into EpiData version 3.1 and subsequently analyzed with SPSS version 20.*

Results: *The study comprised 252 mothers, with a mean age of 29.6 years (SD = 5.98; range: 18-45). The magnitude of pregnancy-induced hypertension was 7.5%. Factors independently associated with pregnancy-induced hypertension included twin delivery (AOR = 5.09; 95% CI: 3.58-34.2), diabetes mellitus (AOR = 8.42; 95% CI: 1.19-63.69), family history of hypertension (AOR = 2.68; 95% CI: 1.84-39.06), family history of pregnancy-induced hypertension (AOR = 3.11; 95% CI: 2.32-41.5), and experiencing stressful life events during pregnancy (AOR = 2.89; 95% CI: 1.58-52.7).*

Conclusion: *The magnitude of pregnancy-induced hypertension observed in this study was higher. Health care providers at all levels should prioritize early identification of the highlighted risk factors to mitigate complications associated with pregnancy-induced hypertension.*

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*Corresponding author:
Chaltu File Teka

Email:
chaltufile2021@gmail.com

INTRODUCTION

Pregnancy-induced hypertension (PIH) is defined as new-onset high blood pressure that develops after 20 weeks of pregnancy in women who had previously normal blood pressure or within the first 24 hours postpartum, in the absence of other signs of preeclampsia or pre-existing hypertension. The diagnosis is typically confirmed by two elevated readings taken at least four hours apart [1].

Hypertensive disorders during pregnancy are typically categorized into four principal types: gestational hypertension, pre-eclampsia, eclampsia, and chronic hypertension [2]. Gestational hypertension is characterized by high blood pressure alone, while preeclampsia is diagnosed when hypertension is accompanied by proteinuria. Severe preeclampsia is characterized by markedly elevated blood pressure, defined as systolic values of 160 mmHg or higher or diastolic values of 110 mmHg or higher, plus one or more signs of severe organ involvement. A progression of this condition is eclampsia, which involves the onset of seizures, affects about one in 1,600 pregnancies, and typically manifests near term [3]. Chronic hypertension in pregnancy refers to elevated blood pressure that exists before conception, is identified before the twentieth week of gestation, or continues beyond 42 days following delivery[4].

Although the precise etiology of PIH remains unclear, several risk factors have been identified, including multiple gestations, a prior history of chronic hypertension or PIH, gestational diabetes, chronic conditions such as renal disease or diabetes mellitus, and low socioeconomic status [5].

Hypertensive disorders represent the most frequent medical complications of pregnancy, with a global prevalence estimated at 5-10% [3, 5]. It is ranked as the second leading cause of maternal mortality worldwide, following hemorrhage, and contributes substantially to both immediate and long-term morbidity in mothers and their infants, especially in low-resource settings [7, 13].

As reported by the World Health Organization (WHO), complications from hypertensive disorders claim the life of one woman approximately every seven minutes, which accounts for approximately 12% of all pregnancy-related deaths globally [5, 7]. The incidence of preeclampsia is thought to be about seven times greater in developing countries compared to developed nations [8].

In Ethiopia, hypertensive disorders in pregnancy constitute a significant public

health concern, with the national maternal mortality ratio remaining high at 412 per 100,000 live births, with pregnancy-induced hypertension contributing substantially to these fatalities [9]. A review study found that maternal deaths in Ethiopia due to hypertensive disorders have increased alarmingly, rising from 4% in 1980 to 29% in 2022 [10].

Data from various Ethiopian hospitals indicate the widespread prevalence of this condition, with reported rates of 7.9% at Mizan-Tepi University Teaching Hospital, 5.3% at Tikur Anbessa and Gebretsadikshawo Hospitals, and 2.4% at Mettu Karl and Tepi General Hospitals.

The national Emergency Obstetric and Newborn Care (EMONC) assessment reported that preeclampsia complicates 1% of deliveries and 5% of pregnancies, contributing to 16% of direct maternal deaths [11]. Similarly, a study conducted in Western Shoa revealed that hypertensive disorders accounted for 12.3% of maternal mortality[12].

Despite the Federal Ministry of Health's multifaceted efforts to improve maternal health services, morbidity and mortality related to pregnancy-induced hypertension remain on the rise, highlighting the urgent need for strengthened prevention and management strategies [13].

In addition, previous studies emphasized preeclampsia specifically and have been conducted on the magnitude and adverse pregnancy outcome of PIH, with less emphasis on the associated risk factors of PIH. Most existing studies did not employ primary data and did not include potential associated factors such as maternal education, anthropometric measures (weight, height, BMI), or maternal smoking and alcohol consumption. Furthermore, there is an absence of prior research in the present study setting.

Therefore, we assessed the prevalence of pregnancy-induced hypertension and evaluated associated risk factors among women presenting for delivery at public hospitals in East Wallaga Zone, Western Ethiopia.

METHODS AND MATERIALS

Study area and period

The study was carried out in selected public hospitals in East Wallaga Zone, Oromia Region. Nekemte, the zonal administrative center, is located 331 km west of Addis Ababa. East Wallaga comprises 17 woredas, one special town administration, 43 urban kebeles, and 287 rural kebeles.

The zone provides health services to a population of more than 1,660,124 people (827,899 males and 832,225 females), including 418,683 individuals in the reproductive age group (15–49 years). Health facilities in the zone include 5

government hospitals, 65 health centers, and 326 health posts (East Wallaga Zone Health Office report, unpublished).

The study was carried out in selected public hospitals of East Wallaga Zone: Nekemte Comprehensive Specialized Hospital, Wollega University Referral Hospital, Jima Arjo Primary Hospital, and Sibu Sire Primary Hospital, excluding Gida Ayana General Hospital. Data collection was performed from January to March 2023.

Study design

A Health facility-based cross-sectional study design was conducted

Source Population

The source population included all mothers who sought delivery services at public hospitals in East Wallaga Zone within the data collection timeframe.

Study Population

All selected mothers who received delivery services at public hospitals in the East Wallaga Zone during the study period.

Ethical consideration

Ethical clearance was secured from the Wollega University Institute of Health Sciences (approval number: WU 214/2015). Data collection commenced after obtaining

official permission from the respective hospital administrative offices

Sample size calculation and sampling technique

Using the single-population proportion formula, the sample size was determined assuming a PIH prevalence of 8.25% from Arbaminch town [26], a 95% confidence level, a 5% margin of error, and Zα/2=1.96 =1.96, resulting in a required sample of 252**.**

For the second objective, which focused on associated factors, variables such as gravidity, previous history of PIH, and alcohol consumption were identified as significant predictors in earlier studies (18, 22). The sample size for these variables was calculated using Epi Info (Table 1).

Table 1: Sample size for pregnancy-induced hypertension and associated factors by using independent variables.

Variable	CI%	% of outcome in un exposed	COR	Power	Sample size	With 10% Non-response Rate	reference
Previous Hx of PIH	95	24	3.4	80	202	222	18
Gravidity	95	41.9	2.68	80	150	165	22
Alcohol drinking	95	55.8	3.21	80	130	143	22

The samples were proportionally allocated to sample size in each hospital (Figure 1).

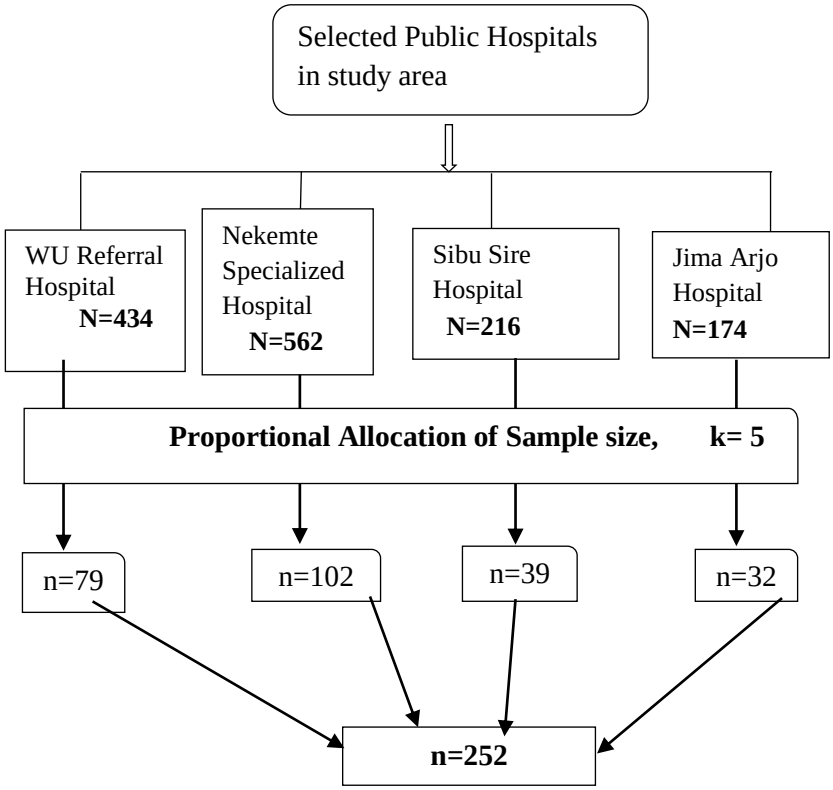

Figure 1: Sample size allocation to study sites, 2023.

Data Collection tool and procedure

Data collection tool

The questionnaire was prepared from earlier research and by a review of pertinent literature on the topic (16,17). The questionnaire was initially prepared in English and translated into Afaan Oromo. It was then back-translated into English by a knowledgeable translator, followed by another translation into Afaan Oromo to ensure consistency between the versions.

The questionnaire was further modified after a pretest. The data was collected using a pretested, structured, interviewer-administered questionnaire, and the patient's chart was reviewed.

Data Collection Procedure

Data were gathered through face-to-face interviews and review of mothers' medical cards using a semi-structured questionnaire. Information on socio-demographic characteristics, gynecological and obstetric history, family history, medical background, and behavioral factors was obtained through interviews, while details such as the diagnosis of pregnancy-induced hypertension and test results not captured during interviews were extracted from mothers' medical records.

Anthropometric measurements were taken using standardized procedures and appropriate equipment for each mother.

Maternal weight and height were assessed with a stationmeter equipped with a height rod (Italy), calibrated before each use. Participants' weight was measured to the nearest 0.1 kg while standing barefoot, and height was recorded to the nearest 0.1 cm in a barefoot, upright position with heels together and back straight. Mid-upper arm circumference (MUAC) was assessed with a flexible, non-elastic measuring tape and recorded to the nearest 0.1 cm. Before blood pressure assessment, participants rested for ten minutes. Blood pressure was then measured with a mercury sphygmomanometer, applying a cuff that covered two-thirds of the upper arm to the right arm while the participant was seated upright.

Cuff inflation proceeded at 2-3 mmHg; SBP was measured at the first Korotkoff sound and DBP at the fourth (muffled) Korotkoff sound.

To ensure proper functioning of the device, the data collector tested it by measuring a colleague's blood pressure before use. Participants with abnormal readings were reassessed immediately, and if the result remained abnormal, a confirmatory measurement was repeated after 4–6 hours. Data collection was conducted between February 1 and April 30, 2023.

Eligibility criteria

Mothers who delivered at the selected hospitals during the study period were eligible for inclusion; mothers who were critically ill and unable to communicate following completion of their treatment were excluded.

Study variables

Dependent variable:

Pregnancy-induced hypertension

Independent variables:

Socio-demographic characteristics such as age, sex, marital status, educational level, occupation, income, religion, and residence were assessed. *Gynecological and obstetric factors*, including age at first pregnancy, pregnancy status, pregnancy interval, parity, gravidity, history of abortion, antenatal care (ANC) follow-up, multiple pregnancy, and congenital anomalies, were also considered. In addition, *family and medical history* variables were examined, including family history of hypertension, pregnancy-induced hypertension, and diabetes mellitus, as well as personal history of diabetes mellitus, kidney disease, anemia, and current asthma. *Anthropometric and behavioral factors* such as maternal weight, height, body mass index (BMI), mid-upper arm circumference (MUAC), stressful life events, cigarette smoking, alcohol consumption, and khat chewing were included in the study.

Data Quality Assurances

Data collection employed a pretested, structured interviewer-administered questionnaire. The tool was prepared in English, translated into Afaan Oromo, and back-translated by independent translators to ensure variable consistency. A pretest on 5% of the sample was conducted at Nekemte Health Center ten days before data collection.

After the pretest, modifications were introduced to enhance the reliability and uniformity of the data collection tool. Eight BSc midwives were engaged as data collectors, while four supervisors holding MPH or MSc degrees oversaw the process. Before fieldwork, the data collectors received two days of training conducted by experts and the principal investigator. The training addressed the study objectives, ethical considerations, correct application of measurement scales, eligibility criteria, proper completion of questionnaires, and standardized approaches for interacting with study participants.

In the final stage, the data collection sites were refined, and data collectors were deployed. The supervisors and the principal investigator subsequently reviewed the collected questionnaires to ensure accuracy and completeness.

Data processing and analysis

Questionnaires were checked for completeness, coded, and entered into EpiData 3.1; the dataset was then exported to SPSS 25.0 for analysis. Entries were cross-verified with the originals, and discrepancies were corrected using unique codes. Frequency distributions and summary statistics were generated, while multicollinearity was assessed using variance inflation factors. Internal consistency was evaluated with Cronbach's alpha, and model fitness with the Hosmer–Lemeshow test.

Bivariate and multivariable logistic regression analyses were conducted to assess associations between pregnancy-induced hypertension and candidate variables. Variables with $p<0.25$ in the bivariate analysis were entered into the multivariable model to adjust for confounding and determine associated factors. Estimates are reported as adjusted odds ratios with 95% confidence intervals; significance threshold set at $p<0.05$.

RESULTS

Socio-demographic Characteristics

A total of 252 mothers participated in the study, yielding a 100% response rate. Of these, 135 (53.6%) were urban residents. The mean age of participants was 29.6 years (SD ±5.98), ranging from 18 to 45 years. Most respondents, 239 (94.8%), were currently married. With respect to educational status, 92 (36.5%) had completed grades 9–12. In terms of occupation, the largest group was housewives (88; 34.9%), followed by farmers (62; 24.6%). Regarding religion, half

of the respondents (126; 50%) identified as Protestant, while 75 (29.8%) were Orthodox Christians.

Obstetric and Gynecologic characters

Of the 252 participants, 207 (82.1%) had experienced two or more pregnancies. The mean age at first pregnancy was 22.2 years (SD ±3.67), ranging from 15 to 42 years. Most respondents, 213 (84.5%), reported that their pregnancy was planned, and nearly all, 243 (96.4%), had a history of antenatal care (ANC) follow-up. A total of 200 (79.4%) were multiparous. Thirty-seven (14.7%) had gestational diabetes, while 35 (13.8%) reported a current twin delivery. More than half, 155 (61.5%), had an interpregnancy interval of ≥24 months. The majority (76.6%) had no previous history of pregnancy-induced hypertension (PIH), and only 11 (4.4%) reported such a history.

Table 2: Socio-demographic characteristics of study participants at selected hospitals, East Wallaga Zones in 2023(n=252).

Variables	Level/Categories	frequency	Percent%
Age group	<20	17	6.7
Residence	20-34	175	69.4
	35 and above	60	23.8
Residence	Urban	135	53.6
	Rural	117	46.4
Religion	Protestant	126	50
	Orthodox	75	29.8
	Muslim	22	8.7
	Waaqeffataa	12	4.8
	Others	17	6.7
Marital status	Married	239	94.8
	Single	6	2.4
	Divorce	4	1.6
	Widowed	3	1.2
Educational status	No formal	14	5.6
	Grade 1-8	60	23.8
	Grade 9-12	92	36.5
	Diploma /level	55	21.8
	Degree& above	31	12.3
Job/Occupation	House wife	88	34.9
	Farmer	62	24.6
	Merchant	29	11.5
	Government employer	60	23.8
	Non-Government employer	4	1.6
	Others	9	3.6
House hold monthly income	<1000	67	26.6
	1001-2499	63	25
	>2500	122	48.4
Family size	1-2	23	9.1
	3-4	108	42.9

Magnitude of PIH

Among the study participants, 232 (92.1%) had systolic blood pressure between 90–139 mmHg, while 19 (7.5%) recorded values ≥140 mmHg. Regarding diastolic blood pressure, 229 (89.7%) had readings between 60–89 mmHg, whereas 19 (7.5%) had values ≥90 mmHg. Overall, the prevalence of pregnancy-induced hypertension was 19 (7.5%) (Table 4).

Table 3 Obstetric and Gynecologic characteristics of study participants at selected hospitals, East Wallaga Zones in 2023(n=252).

Variable	Level/Category	Frequency	Percent%
Age of first pregnancy	<18	8	3.2
	≥18	244	96.8
Pregnancy status	Planned	213	84.5
	Unplanned	39	15.5
Number of total pregnancies	Primegravida	45	17.9
	Multigravida	207	82.1
Total number of births	Primipara	52	20.6
	Multipara	200	79.4
History of abortion	Yes	37	14.7
	No	170	67.5
ANC follow-up	Yes	243	96.4
	No	9	3.6
Space between pregnancy in month	≤23	52	20.6
	≥24	155	61.5
Current history of PIH	Yes	19	7.5
	No	233	92.5
History of PIH before this pregnancy	Yes	14	5.6
	No	193	76.6
History of GDM before this pregnancy	Yes	4	1.6
	No	203	80.6
Currently GDM	Yes	11	4.4
	No	241	95.6
History of congenital anomalies	Yes	3	1.2
	No	249	98.8
Multiplicity of pregnancy	Singleton	217	87
	Twin/multiple	35	13.8

Table 4: characteristics related to the magnitude of PIH at selected hospitals, East Wallaga Zones, Ethiopia, in 2023(n=252).

Variable	Level/Category	Frequency	Percent%
Systolic blood pressure	≤ 89	1	0.4
	90-139	232	92.1
	≥ 140	19	7.5
Diastolic blood pressure	≤ 59	7	2.8
	60-89	226	89.7
	≥ 90	19	7.5
Blood pressure(sbp/dbp)	Normotensive	233	92.5
	Hypertensive	19	7.5

Family history and Medical characters

Among the participants, 130 (51.6%) reported no family history of hypertension, while 101 (40%) had a family history of pregnancy-induced hypertension (PIH). Only 18 (7.1%) had a family history of diabetes mellitus (DM), whereas 31 (12.3%) were currently living with DM. In addition, 21 (8.3%) participants reported kidney disease, and 8 (3.2%) had asthma (Table 5).

Table 5 Family history and Medical history of study participants at selected hospitals, East Wallaga Zones in 2023(n=252).

Variables	Level/category	frequency	Percent%
Family history of HPN	Yes	122	48.4
	No	130	51.6
Family history of PIH	Yes	101	40
	No	151	60
Family history of DM	Yes	18	7.1
	No	234	92.1
Did you have a history of DM	Yes	31	12.32
	No	221	87.7
Did you have kidney disease	Yes	21	8.3
	No	231	91.7
Did you have asthma	Yes	8	3.2
	No	244	96.8

Behavioural and anthropometric measurement factors

In this study, 49 (19.4%) participants reported experiencing stressful life events during the current pregnancy. Seventeen (6.7%) consumed alcohol, six (2.4%) used tobacco, and eight (3.2%) had ever chewed khat. A total of 45 (17.9%) respondents were diagnosed with anemia, of whom 11 (4.4%) had moderate anemia and 30 (11.9%) had severe anemia. Four participants (1.6%) had a BMI below 18.5 kg/m², while eight (3.2%) had a MUAC ≥30 cm. Additionally, 21 (8.3%) respondents had MUAC measurements <23 cm (Table 6).

Table 6: Anthropometric and behavioral factors of study participants at selected hospitals, East Wallaga Zones in 2023(n=252).

Variables	Level/category	Frequency	Percent%
Faced a stressful life event currently	Yes	146	58
	No	106	42
Alcohol drinking	Yes	17	6.7
	No	235	93.3
Smoking	Yes	6	2.4
	No	246	97.6
Have ever chewed khat	Yes	8	3.2

	No	244	96.8
Have anemia currently	Yes	45	17.9
	No	207	82.1
Anemia/hemoglobin	Mild(10-11)	4	1.6
	Moderate(7-9.9)	11	4.4
	Sever(<7)	30	11.9
Body mass index	<18.5	4	1.6
	18.5-24.9	146	57.9
	25-29.9	94	37.3
	>30	8	3.2
MUAC during the last trimester of Px	<23cm	21	8.3
	≥23cm	231	91.7

Associated Factors of Pregnancy-Induced Hypertension

Variables considered for multivariable logistic regression included sociodemographic, obstetric, medical, and lifestyle factors. In the final model, significant predictors of pregnancy-induced hypertension (PIH) were twin delivery, diabetes mellitus (DM), stressful life events, family history of hypertension (HTN), family history of PIH, and occupation.

Mothers with twin deliveries had fivefold higher odds of PIH [AOR = 5.08, 95% CI: 3.56–34.2], while those with DM had eightfold higher odds [AOR = 8.42, 95% CI: 1.19–63.69]. A family history of HTN [AOR = 2.68, 95% CI: 1.84–39.06] or PIH [AOR = 3.11, 95% CI: 2.32–41.5] tripled the risk. Stressful life events also increased the likelihood nearly threefold [AOR = 2.89, 95% CI: 1.58–52.7]. Conversely, being a merchant was protective, with 97% lower odds compared to housewives [AOR = 0.029, 95% CI: 0.001–0.639] (Table 7).

Table 7. Multivariable analysis of factors associated with pregnancy-induced hypertension among mothers who gave birth at selected hospitals, East Wallaga Zones in 2023.

Variable	Category	PIH		COR	AOR	P-value
		Yes	No			
Age group	<20	2(11.8%)	15(88.2%)	1.50(0.29, 7.61)*	0.36(0.10,1.23)	0.11
	20-34	7(4%)	168(96%)	0.31(.06, 1.64)*	0.27(0.03,2.4)	0.244
	35 and above	106(16.7%)	50(83.3%)	1	1	
Residence	Urban	13(9.6%)	122(90.4%)	.50(.19, 1.38)*	2.05(.59,7.04)	
	Rural	6(5.1%)	111(94.9)	1	1	
Marital status	Married	18(7.5%)	221(90.4%)	1	1	
	Single	0(0%)	6(100%)	0.000	0.00	
	Divorce	1(25%)	3(75%)	0.23(0.40, 41.38)*	1.49(0.003,78.9)	0.900
	Widowed	0(0%)	3(100%)	0.000	0.00	
Occupation/Job	House wife	9(10.2%)	79(81.2%)	1	1	
	Farmer	2(3.2%)	60(96.8%)	0.29(0.61,1.40)*	0.20(0.035,1.19)	0.079
	Merchan	1(3.4%)	28(96.6%)	0.31(0.38,2.59)*	0.029(0.001,0.63)	0.025**

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	Gov'tem ployer	7(11.7%)	53(88.3%)	1.16(0.407,3.30)*	0.47(0.11,2.03)	0.317
	NGO employe r	0(0%)	4(100%)	0.000	0.000	
	Others	0(0%)	9(100%)	0.000	0.000	
HH monthly income in EBR	<1000	7(10.4%)	60(89.6%)	0.76(0.28,2.11)	0.49(0.13,1.83)	0.292
	1001-2499	2(3.2%)	61(96.8%)	0.28(0.06,1.40)*	0.14(0.015,1.29)	0.083
	≥2500	10(8.2%)	112(91.8%)	1	1	
Space between pregnancy	<23months	1(1.9%)	51(98.1%)	5.06(0.65, 39.49)*	0.388(0.04,3.76)	0.415
	≥24	14(9.0%)	141(91%)	1	1	
Previous history of PIH	Yes	12(85.7%)	2()	0.003(0.00,0.17)*	0.000	
	No	3(1.6%)	190(98.4%)	1	1	
Current GDM	Yes	3(27.3%)	8(72.6%)	0.003(0.00,0.17)*	0.18(0.025,1.387)	0.100
	No	16(6.6%)	125(93.4%)	1	1	
Congenital anomaly	Yes	1(33.3%)	2(66.7%)	6.417(0.55,74.2)*	1.045(0.017,64.0)	0.98
	No	18(7.2%)	231(92.8%)	1	1	
Multiplicity of pregnancy	Yes	19(54%)	16(46%)	6.007(16.05,22.4)*	5.088(3.56,34.2)	0.000**
	No	3(1.4%)	214(98.6%)	1	1	
Family history of HPN	Yes	18(14.8.5%)	104(85.2%)	22.3(2.93,17.06)*	2.68(1.84,39.06)	0.000**
	No	1(0.8%)	129(99.2%)	1	1	
Family history of PIH	Yes	83(82.2%)	18(17.8%)	32.53(4.266,24.8)*	3.10(2.32,41.5)	0.009**
	No	1(0.7%)	150(99.3%)	1	1	
Current history of DM	Yes	18(18.8%)	69(81.2%)	0.079(0.022,0.09)*	8.42(1.19,63.69)	0.044**
	No	3(1.8%)	164(98.2%)	1	1	
Kidney disease	Yes	8(38.1%)	13(61.9%)	0.08(0.028,0.24)*	0.33(0.084,1.23)	0.111
	No	11(4.8%)	220(95.2%)	1	1	
Faced a stressful event	Yes	18(12.3%)	128(87.7%)	14.75(1.93,112.4)*	2.89(1.58,52.7)	0.028**
	No	1(0.9%)	105(99.1%)	1	1	
Alcohol consumption	Yes	3(17.6%)	14(82.3%)	0.34(0.89,1.31)*	1.00(0.15,6.76)	0.995
	No	16(6.8%)	219(93.3%)	1	1	

***=P < 0.25 **= P < 0.05**

DISCUSSION

This study assessed the magnitude and associated factors of pregnancy-induced hypertension. Six factors were found to be significantly associated with the condition: multiple pregnancies, history of diabetes mellitus, stressful life events during the current pregnancy, family history of hypertension, family history of pregnancy-induced hypertension, and maternal occupation.

In this study, the magnitude of pregnancy-induced hypertension was 7.5%, which is slightly lower than findings reported in Iran (9.8%), Dessie Referral Hospital (8.4%), and Jimma University Specialized Hospital (8.4%). (33,19,18). The prevalence of PIH in this study (7.5%) was comparable to findings from India (7.8%) and Mizan Tepi, southwest Ethiopia (7.9%) (34,16). In contrast, the prevalence of PIH in this study was higher than reports from Tikur Anbessa Hospital (5.3%) and Mettu Karl Hospital (2.4%) (35,20). This variation may reflect heterogeneity in study period, study design, and the health-seeking practices of pregnant women. Additionally, the discrepancy could

reflect the impact of current maternal health policies that promote facility-based care, thereby increasing case detection, as well as differences in lifestyle factors.

This study identified factors associated with pregnancy-induced hypertension, with twin deliveries increasing the risk fivefold compared to singleton pregnancies. This finding is consistent with studies conducted in Egypt, Mettu Karl Referral Hospital, and China (29,21).

Pregnant women with a family history of hypertension were three times more likely to develop pregnancy-induced hypertension compared to their counterparts. This result aligns with findings from Dessie Referral Hospital and central Tigray (19,22) and may be explained by genetic factors that predispose mothers physiologically to PIH.

The odds of developing pregnancy-induced hypertension were almost threefold higher among mothers with a family history of the condition. This observation is consistent with reports in the Current Diagnosis and Treatment in Obstetrics and Gynecology textbook and with studies from Ghana and Mizan Tepi University Teaching Hospital (27,28,16).

Diabetes mellitus was another significant predictor of pregnancy-induced hypertension. Mothers with a history of diabetes were more likely to develop PIH compared to those without such a history. This result aligns with studies done in Bangladesh, Germany, and at Mettu Karl Referral Hospital (8,6,20).

Exposure to stressful events during pregnancy was associated with a threefold increase in the odds of pregnancy-induced hypertension relative to unexposed women, corroborating findings from a US study (32). In contrast, mothers engaged in merchant occupations had 97% lower odds of PIH than housewives. This protective effect may be linked to the psychological benefits of self-income generation and reduced exposure to indoor air pollution from household cooking. Previous studies have also identified indoor air pollution as a contributing factor to pregnancy-induced hypertension (37,38).

This study highlights the high prevalence of PIH in the study area, underscoring the need for health care providers at all levels to prioritize early identification of key risk factors, including twin pregnancy, diabetes mellitus, family history of hypertension or PIH, and stressful life events during pregnancy, and to strengthen preventive measures accordingly.

Limitation

Recall bias may happen regarding data from history. As a result, this result may be prone to biases, which could lead to over- or underestimation of the prevalence and indicator/variables.

CONCLUSION

The magnitude of pregnancy-induced hypertension in this study was higher than that reported in several other studies. Key factors significantly associated with PIH included twin pregnancy, history of diabetes mellitus, family history of hypertension, family history of PIH, and stressful life events during pregnancy.

Therefore, promoting health-seeking behavior among pregnant women in both urban and rural settings is essential. Early engagement with maternal health services enables timely diagnosis of PIH and helps prevent its potential complications.

RECOMMENDATION

To address the high prevalence of pregnancy-induced hypertension, coordinated action is required across different levels of the health system. Health professionals should strengthen preconception care to identify women at risk and provide targeted awareness on health-seeking behavior, emphasizing the importance of early diagnosis to prevent complications. Policy makers are encouraged to develop and implement updated guidelines for risk identification, early detection, and management of PIH to ensure standardized practice nationwide.

Hospitals, in turn, should make these guidelines readily available within health facilities and invest in building the capacity of healthcare providers through continuous training on early risk detection and management. Together, these measures can improve maternal outcomes and reduce the burden of pregnancy-induced hypertension.

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