AWARENESS REGARDING PREGNANCY INDUCED HYPERTENSION AMONG PREGNANT WOMEN ATTENDING A TERTIARY CARE HOSPITAL OF POKHARA NEPAL

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Abstract

Introduction: Pregnancy Induced Hypertension (PIH) is the major contributor for maternal and neonatal complications morbidity, mortality and premature birth. It is second most leading cause of maternal death contributing to 22% of total death. Therefore, can be prevented by proper knowledge, awareness of the disease and its complications. Objective of the study to assess the level of awareness regarding PIH among pregnant women attending a tertiary care hospital of Pokhara Nepal.

Methods: A descriptive cross sectional study design with a convenience sampling technique was used to assess the awareness regarding pregnancy induced hypertension among pregnant women attending antenatal outpatient department, Pokhara Academy of Health Science. The total sample size was 226 pregnant women. Face to face interview technique was used to collect the data through structured interview schedule.

Results: More than two-third (66.8%) of respondents had moderate level of awareness, 19% had low level of awareness and only 14.2% had good level of awareness regarding pregnancy induced hypertension. The level of knowledge was not significantly associated with any of the socio-demographic variables.

Conclusion: study concludes about two-third of pregnant women had moderate level of awareness regarding PIH and study showed no significance association between level of awareness and any of socio-demographic variables. Awareness raising program need to be conducted in the antenatal clinic to increase the awareness level of pregnant women about PIH.

Keywords: *Level of awareness, Pregnancy Induced Hypertension, Tertiary hospital*

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1. Introduction

Pregnancy is a unique and intricate phase in a woman's life (Bjelica et al., 2018). Pregnancy is often marked by conditions that significantly endanger the lives of both expectant mothers and their unborn babies. Each year, more than 585,000 women globally lose their lives due to childbirth-related complications, with 99% of these deaths occurring in developing countries (Wilkerson & Ogunbodede, 2019).

Hypertension during pregnancy is defined as a systolic blood pressure of 140 mmHg or higher, a diastolic blood pressure of 90 mmHg or higher, or both recorded in a clinical or hospital setting. Confirmation is required, preferably on two separate measurements, or at an interval of at least 15 minutes in cases of severe hypertension (≥160/110 mmHg) (Cifkova, 2023). Unlike pre-existing hypertension, gestational hypertension develop after 20 weeks of gestation and typically resolving within six weeks after delivery (Aghajanian et al., 2006; Cifkova, 2023). Hypertensive disorders during pregnancy encompass a variety of conditions, including chronic hypertension, gestational hypertension, preeclampsia, and eclampsia that occurs on existing chronic hypertension with or without proteinuria (Department of Health Services, 2018).

Chronic hypertension is characterized by a systolic blood pressure (SBP) ≥140 mmHg and/or a diastolic blood pressure (DBP) ≥90 mmHg that is present prior to conception or detected before 20 weeks of gestation also in addition antihypertensive therapy is required before pregnancy or elevated blood pressure persists beyond 12 weeks postpartum (ACOG, 2019). Gestational hypertension is identified when a previously normotensive woman develops a systolic blood pressure of ≥140 mmHg and/or a diastolic blood pressure of ≥ 90 mmHg after 20 weeks of gestation (Cifkova, 2023).

Pre-eclampsia is defined as blood pressure ≥140/90 mmHg along with proteinuria exceeding 300 mg in a 24-hour period first appears after 20 weeks of pregnancy, but both conditions typically resolve within 12 weeks after delivery. Eclampsia is characterized by the occurrence of seizures in a woman with pregnancy-induced hypertension (PIH) that cannot be explained by other causes and convulsions can manifest before, during, or after labor (Outline of Definition and Classification of Pregnancy Induced Hypertension).

It is also estimated that pregnancy-induced hypertension (PIH) impacts approximately 5 to 8% of all pregnant women around the globe. Globally, 10% of pregnancies are affected by

hypertension, with pre-eclampsia and eclampsia being the primary contributors to maternal and prenatal health complications and fatalities (Muti et al., 2015). Preeclampsia is responsible for approximately 16% of maternal deaths in developing nations, 25% in Latin America, and 10% in Asia and Africa (Naz et al., 2022). PIH is directly responsible for 17.6% of maternal deaths in the United States (International Journal of Gynecology & Obstetrics, 2002). Mortality is strongly linked to the severity of hypertension, with eclampsia alone accounting for 22% of maternal deaths in Nepal (Department of Health Services, 2018). Eclampsia occurs in approximately 5–8% of all pregnancies worldwide, with higher prevalence in women who have pre-existing kidney issues, diabetes, or a history of pregnancy-induced hypertension. It is more common in women under 20 years and over 40 years, as well as in first-time pregnant women and those carrying twins (Index Copernicus Journal Article). Pre-eclampsia affects 5–30% of pregnancies with multiple children, and the risk of preeclampsia increases with these factors (Naz et al., 2022).

PIH is influenced by multiple risk factors, including pre-existing chronic hypertension, diabetes, renal disorders, obesity, short stature, poor nutrition, history of gestational hypertension, hereditary predisposition, autoimmune diseases (such as systemic lupus erythematosus and antiphospholipid syndrome), molar pregnancy, multiple gestations, fetal macrosomia, nulliparity, advanced maternal age, elevated BMI, and conception through assisted reproductive techniques (Karrar et al., 2025). Signs and symptoms of pregnancy-induced hypertension include a persistent headache, sudden onset of vision disturbances, loss of consciousness, ongoing discomfort in the right upper abdomen or epigastric region, nausea and vomiting, swelling of the hands and face, and seizures (Berhe et al., 2020).

PIH lead to serious complications such as ischemic heart disease, stroke, liver and kidney damage, abruptio placentae, disseminated intravascular coagulation (DIC), and HELLP syndrome (hemolysis, elevated liver enzymes, and low platelet count) in the mother (Naz et al., 2022). Similarly fetal complication includes Intra-Uterine Growth retardation (IUGR), prematurity, intrauterine death, significantly high in pre-eclampsia (Cifkova, 2023). In severe cases of pre-eclampsia, it can also cause intrauterine growth restriction and preterm birth (Chaemsaithong et al., 2022).

The majority PIH cases were seen in young women and had not completed antenatal visits about half 50% of deliveries were done by cesarean among patients with PIH, 43.1% of the

deliveries were normal vaginal and other 6.9% were assisted (instrumental) deliveries (Shrestha et al., 2021). Preeclampsia was found to have a strong association with cesarean sections; with a likelihood 8.11 times higher compared to normal pregnancies (Das et al., 2023).

Pregnancy-induced hypertension (PIH) affects approximately 6–10% of all pregnancies (Kintiraki et al., 2015). PIH can lead to severe complications, including placental abruption and hematological abnormalities affecting the kidneys, lungs, liver, and brain. Fetal complications may arise before, alongside, or independently of maternal symptoms and may include oligohydramnios, intrauterine growth restriction (IUGR) in up to 30% of cases, abnormal umbilical artery Doppler findings, reduced resistance in the fetal middle cerebral artery, irregular ductus venosus waveforms, and stillbirth (Magee et al., 2014).

Expectant mothers should recognize the warning signs of PIH and promptly seek medical attention (Dutta, 2015). Timely diagnosis and proper intervention can greatly enhance maternal survival rates. As primary caregivers, nurses have a vital responsibility in enhancing mothers' understanding of various pregnancy-related complications (Knowledge of Antenatal Women Regarding Pregnancy Induced Hypertension). Low awareness among pregnant women is a key factor contributing to delays in seeking healthcare and making timely decisions, creating a barrier to the early diagnosis and management of severe conditions (Berhe et al., 2020).

In Nepal, although maternal health services have expanded, there is limited data on women's awareness and understanding of PIH, especially in specific hospital or community settings. This knowledge gap hinders the development of effective educational strategies within antenatal care programs (Basnet et al., 2023). Assessing the current level of awareness among pregnant women is therefore vital for identifying areas that require improvement and for guiding targeted interventions aimed at reducing the burden of PIH (Subedi, 2014).

2. MATERIAL AND METHODS

A hospital -based descriptive cross-sectional study design was employed to assess the level of awareness regarding PIH among pregnant women attending a selected tertiary care hospital of Pokhara, Nepal. The study sample consisted of 226 pregnant women attending ANC OPD of Western Regional Hospital, Pokhara Academy of Health Sciences. Non-probability

convenience sampling technique was used to select the sample and face-to-face structured interview schedule was used to collect data. Data were collected through a structured face to face interview schedule and analyzed using Statistical Package for Social Sciences (SPSS) using descriptive and inferential statistics. The sample size for this study was calculated on the basis of adequate level of knowledge on Pregnancy Induced Hypertension conducted in Tribhuvan University Teaching Hospital, Kathmandu, in which the adequate level of knowledge regarding Pregnancy Induced Hypertension is 17.9%.28 Estimated sample size (n_0) = (Z^2 Pq)/e^2 and final sample for this study was 226.

3. INCLUSION CRITERIA

Inclusion criteria for this study includes all the pregnant women who visit ANC clinic of tertiary hospital of Pokhara at the period of data collection. Those women who were available and willing to participate were included in the study.

4. DATA COLLECTION

Data were collected through face-to-face interview using validated structured interview schedule after obtaining approval from Institutional Review Committee (IRC) of Pokhara Academy of Health Sciences on June 1, 2025 Ref. Number 117/081. Subsequently, written permission was obtained from concerned authorities of Pokhara University. The face-to-face interview was conducted with participants using structured interview schedule and sample of the study were selected through non-probability convenience sampling technique. Privacy was maintained as the participants were not subjected to any interference as interview was conducted on breastfeeding room. Informed consent was obtained from the participants who met the inclusion criteria. Participation was entirely voluntary and participants were fully informed about the purposes, procedure and their right to decline or withdraw at any stage before obtaining the written consent. It took about 15-20 minutes with each respondent to collect information. In average I interview about 15-18 participants each day. Data was collected in a three-week period.

5. STATISTICAL ANALYSIS

Data was edited, coded, and entered in Epi-data version 3.1 with a validated command. All the entered data was transferred to the Statistical Package for Social Sciences (SPSS) version 16 program for further analysis. Data was analyzed by using descriptive statistics (as

frequency, percentage, mean, and standard deviation), and an inferential statistical test was applied according to the nature of the data. The findings of the study are presented in tables. The chi-square test was used to find out the association between dependent and independent variables. Bloom's cut-off points were used to categories the level of awareness in this study. The total score was 30, and score between 24-30 i.e. 80-100% represents high level of awareness, score between 18-23 i.e.60-79% represents moderate level of awareness whereas score between 0-17 i.e.< 60 % represents low level awareness regarding PIH among pregnant women.

6. RESULTS

The data in Table 1 shows that out of 226 respondents, most of respondents were aged between 25–35 years (46.9%). The minimum age of the respondent is 18, while the maximum age is 40 years, with a mean and standard deviation of 26.87 ± 5.179. Regarding age at first pregnancy, the maximum (59.7%) reported conceiving at the age between 20-30 years. With regard to religion, majority of respondents (91.2%) follow Hinduism. About one-third (36.7%) of the respondents were Bhramin-Chhetri. More than half of the respondents (54.9%) live in joint families and most of the respondents (41.6%) reside in municipalities. The majority of respondents (88.9%) did not reported history of Pregnancy-Induced Hypertension. Regarding the primary source of information about PIH, most respondents (65.9%) identified health professionals as their source. In terms of blood pressure monitoring during pregnancy, more than two-thirds of respondents (68.8%) reported checking their blood pressure during antenatal visits only.

Table 1: Distribution of respondents on the basis of demographic Information(n=226)

Variables	Frequency (f)	Percentage (%)
Age in completed years		
< 20 years	25	11.0
20–30 years	148	65.5
> 30 years **Mean ± SD (Min–Max)**26.87 ± 5.179 (18–40)	53	23.5
Age at first pregnancy		
< 20 years	82	36.3
20–30 years	135	59.7

> 30 years **Mean ± SD (Min–Max)** 22.58 ± 3.859 (17–38)	009	4.0
Religion		
Hindu	206	91.2
Buddhist	015	6.6
Christian	003	1.3
Muslim	002	0.9
Ethnicity		
Brahmin–Chhetri	83	36.7
Janajati	55	24.3
Dalit	82	36.3
Madhesi	06	2.70
Type of Family		
Nuclear	99	43.8
Joint	124	54.9
Extended	003	1.3
Permanent Residence		
Metropolitan city	76	33.6
Municipality	94	41.6
Rural municipality	56	24.8
History of PIH		
No	201	88.9
Yes	25	11.1
Primary Source of Information		
Health professional	149	65.8
Friends and relatives	39	17.3
Family members	25	11.1
Mass media	13	5.8
Frequency of BP Check in This Pregnancy		
Once a day	7	3.1
Twice in a week	17	7.5
Once in two weeks	47	20.8
During ANC visit	155	68.6

Data depicted in table 2 reveals that majority (89.8%) of respondents were literate and nearly half (49.1%) of respondents have had secondary level education. Meanwhile, majority (95.1%) of the respondent's husband were literate and more than half (53.1%) have had secondary level education. In terms of occupation, the majority of respondents (70.8%) are homemakers while among husband, more than one-third (35.8%) are involved in business. In terms of family income majority of respondents (89.8%) had up to NPR 80000 monthly family income.

Table 2: Distribution on the basis of Socioeconomic Characteristics (n=226)

Variables	Frequency (f)	Percentage (%)
Education of Respondent		
Literate	203	89.8
Illiterate	007	3.1
Can read and write	016	7.1
If Literate, Level of Education (n = 203)		
Basic level	050	22.1
Secondary level	111	49.1
More than secondary level	042	18.6
Education Level of Respondent's Husband		
Literate	215	95.1
Illiterate	003	1.3
Can read and write	008	3.5
If Literate, Level of Education (n = 215)		
Basic level	057	25.2
Secondary level	120	53.1
More than secondary	038	16.8
Family Monthly Income		
Less than 80,000	203	89.8
80,000 – 160,000	017	7.5

160,001 – 240,000 More than 240,000 **Mean ± SD (Min–Max)** 54137.17 ± 36099.169 (10,000 – 300,000)	 004 002	 1.8 0.9
Occupation of Respondent		
Homemaker	160	70.8
Business	028	12.4
Service	022	9.7
Agriculture	016	7.1
Occupation of Husband		
Agriculture	029	12.8
Service	052	23.0
Business	081	35.8
Foreign employee	064	28.4

The data in table no. 3 shows that slightly more than half (52.7%) of the respondents are multigravida. Regarding parity, the maximum (48.7%) of respondents has had up to 2 previous births. In terms of trimester, two-third of the respondents (65.5%) were in their third trimester at the time of data collection. This indicates that the study population primarily comprised women in late stages of pregnancy. With regard to the number of antenatal care (ANC) visits, the highest proportion (84.5%) of respondents had attended ANC visits more than 3 times.

Table 3: Distribution of respondents according to obstetric history (n=226)

Variables	Frequency (f)	Percentage (%)
Gravida		
Primigravida	107	47.3
Multigravida	119	52.7
Parity (n = 119)		
Up to 2	110	48.7
More than 2	9	4.0
Trimester		
First trimester	15	6.6
Second trimester	63	27.9
Third trimester	148	65.5

Gestational Age		
Up to 13 weeks	15	6.6
14–27 weeks	63	27.9
28–40 weeks	141	62.4
More than 40 weeks	7	3.1
Number of ANC Visits		
Up to 3	35	15.5
More than 3	191	84.5

The data presented in Table 4 illustrates that two-third (66.8%) of respondents had a moderate level of awareness, whereas only (14.2%) of the respondents shows high level of awareness regarding PIH.

Table 4: Distribution of respondents according to the level of awareness. (n=226)

Level of awareness	**Frequency (f)**	**Percentage (%)**
High	032	14.2
Moderate	151	66.8
Low	043	19.0

The data depicted in table 5 shows, majority (80.1%) have had correctly identified meaning of hypertension. Similarly, a high proportion (80.5%) had correctly identified the meaning of Pregnancy Induced Hypertension (PIH) but majority (61.9%) answered incorrectly for the gestational period in which PIH typically occurs. Regarding general knowledge of PIH, three-fourth (75.7%) correctly identified the condition. Similarly, majority (55.3%) also recognized intra-uterine growth restriction as most common fetal growth abnormalities linked to PIH. Most respondents (72.1%) reported that they would seek medical help immediately for the management of fetal movement fluctuation. Similarly, majority (93.8%) respondents were aware that both mother and baby can be affected by PIH However, more than half (55.3%) didn't know that PIH may resolve after delivery.

Table 5: Distribution of respondent based on general awareness aspects of PIH (n=226)

Variables (Correct Response)	Frequency (f)	Percentage (%)
Meaning of hypertension	190	80.1
Meaning of PIH	182	80.5
Weeks of gestation in which PIH usually occurs	86	38.1
General meaning of PIH	171	75.7
Fetal growth abnormality	125	55.3
Measures taken when experienced any sign	205	90.7
Measures taken when fluctuation found in fetal movement	163	72.1
Individuals affected by PIH	212	93.8
Time period to resolve PIH	101	44.7

The data depicted in table 6 shows that majority (88.9%) responded pre-existing high blood pressure before pregnancy as risk factor for PIH. More than half (51.3%) of the respondent identified changed in body weight during PIH. However, majority (64.2%) responded incorrectly to identify the abdominal region where pain occurs during PIH. A large proportion (69.0%) were aware that swelling of certain body parts is a common symptom of PIH. However, awareness of changes in urine was limited, as nearly two-third (65.5%) answered incorrectly.

Table 6: Distribution of respondent based on awareness on clinical feature (n=226)

	Correct response	
Variables	**Frequency (f)**	**Percentage (%)**
Risk factors for PIH*		
Pre-existing high blood pressure before pregnancy	201	88.9
Family history of hypertensive disorder of pregnancy	165	73.0
Obesity	176	77.9
Maternal Diabetes	152	67.3
Multiple pregnancy	151	66.8
Changes in body weight	116	51.3
Pain in abdominal region	081	35.8
Swelling of body parts	156	69.0
Changes in urine	78	34.5

***=multiple response questions**

The data depicted in table 7 shows that significantly high number (93.4%) identified consuming balanced diet is effective dietary adjustments for managing PIH. Majority of the respondents (70.4%) knew about effective lifestyle changes foe managing PIH and medications used in PIH management but nearly two-third (65.9%) gave incorrect answer about appropriate timing for anti-hypertensive drug use during pregnancy. Just above half of the participants (55.3%) and (51.8%) correctly identified the cause of convulsions in PIH and definitive treatment post-convulsion respectively. Most respondents (72.1%) reported that they would seek medical help immediately for the management of fetal movement fluctuation. Majority of the respondents agreed on (95.6%) the importance of regular ANC checkup as a preventive measure of PIH.

Table 7: Distribution of respondent based on awareness regarding prevention and management of PIH(n=226)

	Correct response	
Variables	**Frequency (f)**	**Percentage (%)**
Effective dietary adjustment	211	93.4
Effective lifestyle changes	159	70.4
Drugs used for management of PIH	159	70.4
Timing for using anti-hypertensive drugs	077	34.1
Primary cause of convulsion in PIH	125	55.3
Definitive treatment for PIH	117	51.8
Prevention of PIH*		
Visiting for regular ANC checkup	216	95.6
Being aware about PIH and its consequences	204	90.3
Taking enough rest and maintaining healthy diet	194	85.4
Regular blood pressure monitoring	204	90.3
Regular monitoring of body weight	186	82.3

***=multiple response questions**

Data presented in the table 8 shows that there is no statistically significant association of level of awareness with any selected variable as none of the variables had p-value<0.05.

Table 8: Association between level of awareness with selected variables (n=226)

Variables	Mean score		χ2	d.f	p-value
	≤20	>20			

Age					
<27 years	067	060	0.621	1	0.431
≥27 years	047	052			
Age at first pregnancy					
<22 years	067	065	0.013	1	0.911
≥22 years	047	047			
Religion					
Hindu	108	098	3.668	1	0.055
Others	006	014			
Ethnicity					
Brahmin-Chhetri	038	045	1.139	1	0.286
Others	076	067			
Education of respondent					
Literate	104	099	0.497	1	0.481
Others	010	013			
Education level of husband				1	
Literate	107	108			0.539[#]
Others	007	004			
Monthly family income					
<54000	077	064	0.497		0.481
≥ 54000 and above	037	048			
Occupation of respondent					
Homemaker	083	077	0.450		0.502
Others	031	035			
Occupation of husband					
Foreign employee	034	030	0.257		0.612
Others	080	082			

Type of family					
Nuclear	053	046	0.674		0.412
Others	061	066			
Primary source of information					
Health personnel	076	073	0.056		0.813
Others	038	039			
Blood pressure checkup during this pregnancy					
When visited for ANC visit	077	078	0.116		0.734
Others	037	034			
Permanent residence					
Urban area	087	083	0.148		0.701
Rural area	027	029			
History of pregnancy Induced hypertension					
No	101	100	0.027		0.869
Yes	013	012			

[#] = Fisher's Exact Test, d. f=1

7. DISCUSSION

In present study the level of awareness regarding Pregnancy Induced Hypertension most of the respondents had moderate level of awareness (66.8%), followed by low level of awareness (19%) and high level of awareness (14.2%). This finding was similar to the finding in the study conducted at Tribhuvan University Teaching Hospital (TUTH), Kathmandu where maximum (47.7%) of the respondents had moderate level of awareness, followed by 34.4% inadequate level of awareness and 17.9% adequate level of awareness (Levels of Awareness – The Personal MBA). A study conducted at ANC OPD of tertiary care hospital in Chhattisgarh, showed that more than half (55%) of pregnant women had average knowledge regarding PIH followed by 31% poor knowledge and 14% good knowledge (Bloom's Cutoff Categories for Knowledge and Attitude Scores, n.d.). Another study showed similar findings conducted at S.D.M. Hospital, Bikaner, India, 82% primigravida mothers

have below average knowledge and 18% primigravida mothers have average knowledge regarding pregnancy induced hypertension (Tertiary Care Centers – MeSH). However contradict with the findings of the study conducted in Ekiti State, Nigeria, where 56.6% of respondent had good level of knowledge, followed by fair and poor level of knowledge on 31.7% and 11.7% respectively (Definition of Tertiary Care – Merriam-Webster).

In this study there was no association of awareness regarding Pregnancy Induced Hypertension with demographic variables which was supported by study conducted at public hospitals in Selangor, Malaysia where level of knowledge was not associated to any socio-demographic variables (Berhe et al., 2020). However contradicted by the study conducted at Sheikh Hasina Medical College, Tangail, Bangladesh, which showed association between socio-demographic variables such as age, area of residence, educational status, occupational status, socioeconomic status of respondents (Debebe Argago et al., 2025). Another study also contradicts the findings conducted at as it shows the association between level of knowledge with demographic variables such as, age, residence, type of family, occupation, education, family income (Tertiary Care Centers – MeSH).

8. CONCLUSION

The main aim of the study was to assess awareness regarding pregnancy induced hypertension among pregnant women attending a tertiary care hospital of Pokhara. In this study, about two-third of pregnant women had moderate level of awareness regarding PIH. The study showed no significance association between level of awareness and any of socio-demographic variables. Awareness raising program need to be conducted in the antenatal clinic to increase the knowledge level of pregnant women about PIH.

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10. CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest relevant to the content of this research.

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