



## **Knowledge, attitude and practices of pregnant women aged 18-49 years towards pregnancy induced hypertension (PIH) in Bindura district: Zimbabwe: A case control study**

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### **Abstract**

**Background:** Pregnancy Induced Hypertension (PIH) control among pregnant women emerge to be complicated to accomplish. Part of the main reason for poor control of hypertension is inadequate knowledge, practices and attitude towards PIH. It is one of the main causes of maternal and neonatal morbidity and mortality globally, especially in the developing nations. This was an assessment done towards understanding the management of PIH in Mashonaland Central.

**Objective:** To assess knowledge, attitude and practices of pregnant women towards PIH.

**Methodology:** Mixed methods approach which includes both quantitative and qualitative research fundamentals was used. Mothers with PIH, who visit health facility at 3 and 7 days and at 6 weeks were selected as the case group and mothers without PIH who visit health facility were the control group. A minimum sample of 217 cases and 217 controls was used. Interviews were conducted after ethical approval by the research bodies and after the women consented. Women within the age group of 18-49 years who were diagnosed with PIH during pregnancy and may still have PIH after delivery (March 2020 to December 2020) and women without PIH (n=217) from the same period were the research participants. Four focus group discussions (FGDs), each with 8 participants, were also held. The women were interviewed after ethical approval by the research bodies and after the women consented. Detailed notes were taken during the interviews which were also audiotaped. The results were analysed using Statistical Package for Social Science (SPSS) was used to determine the odds ratios and significant difference among the cases and the control groups.

**Results:** Themes identified were demographic data of participants in relation to the development of PIH, and knowledge on PIH among pregnant women. Being in the age group 18-20 years had a statistically significant negative and defensive effect against development of PIH. The likelihood of being a PIH case increased with age. Participants in the age group of 41 and above are 4.503 times likely to develop PIH in comparison to other age groups (O.R=4.503; 95% C.L=1.780-11392). Having only primary education increased the odd of being a PIH case by 78%. Participants who were in the apostolic sect were 52.130 times likely to developed PIH and this was significantly higher than other religions and statistically significant at  $p < 0.05$ . Being self-employed can have a positive significant association with the development of PIH. Majority 182 (84%), among cases and 146 (67.3%) among controls were not aware of the signs and symptoms of PIH respectively. Majority of participants among the cases, 165 (76%) and 155 (71.4%) among the control group were not aware of the prevention of PIH complications. Of the cases 143 (65.9%) agree that PIH can cause the death or serious illness of a pregnant mother if it is not managed.

**Conclusion:** The study recommends training of health care providers on culture specific measures to manage PIH, decentralization of health centres to improve health care service delivery systems as well as training of peer educators to give health education and support to mothers affected by PIH.

**Keywords:** Pregnancy induced hypertension, knowledge, practices, attitude

### **Introduction**

Pregnancy induced hypertension (PIH) is a common disease in women during pregnancy and is one of the major causes of maternal bleeding and infection which contribute to a large extent to maternal morbidity and mortality (Cunningham *et al.*, 2014) [17]. The impact of PIH is indicated by its outcome, where at least one woman dies of PIH complications every 7 minutes (Susan *et al.*, 2017) [26]. The incidence of PIH globally ranges from 3% to 8% of

every pregnancy; in the USA, it affects from 2% to 5% of pregnancies (Hermes *et al.*, 2012).

A study conducted in Zimbabwe in relation to maternal and perinatal mortality, indicated that PIH is among the most important contributing factors to maternal mortality as well as the third chief concern for referral in labour (Ministry of Health and Child Welfare Zimbabwe, 2007) [21]. In addition, (Tachiwenyika *et al.*, 2009) [27] indicated that, PIH relates to high possibility of causing perinatal mortality. It can also

result in pre-eclampsia, which also is a strong predictor of its recurrence in future gestation, (Darling *et al.*, 2014) [8]. It has been recognized with immense apprehension that knowledge, attitude and practices of pregnant women play a significant role towards PIH management and its outcomes. World Health Organization (WHO, 2014) [30], observed that management of PIH among pregnant women emerge to be complicated due to lack of knowledge. National Heart, Lung and Blood Institute NHLBI, (2013) [23] in their study, pointed out that majority of the pregnant women were not sentient of causes of PIH such as obesity, drinking too much alcohol, first time pregnancy and being younger than 20 years and above 40 years of age (Krishnan *et al.*, 2020) [19].

**Religious Beliefs**

Religion plays an important role regarding PIH; sometimes negative influences from this sector play a very significant role. A study conducted in Zimbabwe by Goshomi (2012) [13], highlighted that religious beliefs towards hypertension have a great impact on the way clients comply with their medication. The study revealed that clients with PIH preferred to visit faith healers before going to hospital, hence clients saw religious prayers as a means of stopping to take their medication causing poor drug compliance hence predisposing them to PIH.

Dodzo *et al.*, (2016) [10] conducted a study in Zimbabwe which indicated that, in some parts of the country, for example, Mt Darwin, pregnant women are referred to clinic or Hospital when the Holy Spirit substantiates darkness over her life (*rima rerufu*). If a pregnant woman starts to experience convulsions during labour or delivery it is attributed to demons of infertility (*mweya yechirume*) hence they cast demons using prayers. However, the treatment seeking behaviour and drug compliance remains poor since they view medicine as defiled including health personnel. Consequently, there are delays in the treatment of conditions such as PIH leading to severe complications.

Attitude and practices of preferring home based and traditional treatment of PIH such as consumption of onion, drinking salt solution and applying Robb to the chest (Robb which is a form of balm used for relieving aches and pains among children and adults as well as treatment of cold and shivering condition), other traditional practice options would be bodily incision (*nyora*) (Nambiar *et al.*, 1999, Dikai, *et al* 2017) [22, 9]. Chavunduka G (1978) [5] also observed that in Zimbabwe the Shona people assume that diseases could either include a normal occurrence or abnormal origin. The disease is considered to be related to infuriated or disappointed spirits that revert to punish the wrongdoer. The guilty person becomes ill. The diviners are consulted and they recommend on procedures to be

followed with the intention of appeasing the enraged spirits. It is assumed that once the demands of the infuriated spirits are met the case is closed and as such the wicked spirit will not cause problems. They also believe that the illness can as well be related to ‘ngozi’ (alien spirits) or witchcraft. The diviner has to be consulted initially in an attempt to establish the spiritual cause of the disease prior to administration of traditional herbs. The individual looks for medical management of the illness at the same time the cause of disease considered to be abnormal for instance headache is managed with “mutara” (traditional medicine used for treatment headache) Chavhunduka, G (1978) [5]. These practices and beliefs delay clients with PIH from seeking treatment early at the same time complicating the condition.

**Methods**

A 1:1 matched case control study was used in nine health facilities in Bindura District as well as Bindura Provincial Hospital. Cases were mothers with PIH who visit health facility at 3 and 7 days and at 6 weeks. Control group comprised mothers without PIH who visit health facility at 3 and 7 days and at 6 weeks. A minimum sample of 217 cases and 217 controls was used. Women were interviewed after ethical approval by the research bodies and after women consented.

The study included 217 (n=217) women within the age group of 18-49 years who were diagnosed with PIH during pregnancy and may still have PIH after delivery (March 2020 to December 2020) and women without PIH (n=217) from the same period. Consecutive sampling technique was used to select clients.

A mixed methods approach which includes both quantitative and qualitative research fundamentals was used (Creswell, 2013) [6]. Hence, a questionnaire, Focus Group Discussion and an interview guide were used as instruments for data collection.

Analysis was done by comparing Quantitative and qualitative outcomes as well as comparing with what literature say about the issues understudy. Qualitative data followed mainly a thematic data analysis and presentation model. Quantitative information will be presented and analysed mostly using ANOVA and all tests will be performed at 95% (P<0.05) confidence level to determine the significant difference between PIH and perinatal outcomes.

**Findings**

Demographic: This section presents the demographic data of participants.

**Table 3.1** Demographic data of participants in relation to the development of PIH

Variables	Cases N=217 (%)	Control N=217 (%)	Odds ratio (confidence interval)	P-value
<b>Age</b>				
18-20	14	49	0.534 (0.314-0.909)	0.001 <sup>a</sup>
21-30	114	103	1.706 (1.164-2.499)	0.001 <sup>a</sup>
31-40	68	54	1.915 (1.251-2.932)	0.002 <sup>a</sup>
41+	21	11	4.503 (1.780-11.392)	0.001 <sup>a</sup>
<b>Marital status</b>				
Single	15	13	1.392 (0.646-3.001)	0.257 <sup>b</sup>
Married	148	199	1.096 (0.531-2.264)	0.048 <sup>a</sup>

Divorced	2	-	(1.978-2.431)	0.210 <sup>b</sup>
Cohabiting	51	5	15.851(6.183-40.637)	0.000 <sup>a</sup>
Widow	1	-	(1.974-2.423)	0.459 <sup>b</sup>
<b>Educational level</b>				
Primary	89	53	2.778 (1.836-4.205)	0.000 <sup>a</sup>
O level	100	144	1.260 (0.860-1.848)	0.138 <sup>b</sup>
Advanced	5	10	0.580 (0.195-1.726)	0.235 <sup>b</sup>
Certificate	14	6	2.888 (1.089-7.663)	0.023 <sup>a</sup>
Diploma	5	3	1.993 (0.470-8.446)	0.275 <sup>b</sup>
Degree	4	1	4.800 (0.532-43.300)	0.139 <sup>b</sup>
<b>Religion</b>				
Christian	39	94	2.106 (1.354-3.275)	0.001 <sup>a</sup>
Apostolic sect	121	78	52.130(28.724-94.61)	0.000 <sup>a</sup>
Pentecostal	22	21	1.081 (0.661-1.766)	0.426 <sup>b</sup>
Atheist	10	11	1.316 (0.547-3.168)	0.347 <sup>b</sup>
Traditional	19	8	4.646 (2.066-10.449)	0.000 <sup>a</sup>
Other	6	5	2.179 (0.718-6.612)	0.128 <sup>b</sup>
<b>Employment</b>				
Formally employed	30	28	1.312 (0.754-2.283)	0.205 <sup>b</sup>
Self-employed	35	25	1.793 (1.032-3.115)	0.026 <sup>b</sup>
Unemployed	127	152	0.963 (0.650-1.428)	0.465 <sup>b</sup>
Gold panner	10	2	6.164 (1.334-28.474)	0.008 <sup>a</sup>
Farming	2	8	0.288 (0.060-1.373)	0.088 <sup>b</sup>
Housekeeper	13	2	16.355 (2.120-126.16)	0.000 <sup>a</sup>

\*superscripts <sup>a</sup>=significant ( $p < 0.05$ ) <sup>b</sup>=not significant ( $p > 0.05$ )

The table above shows demographic data of participants in relation to development of Pregnancy Induced Hypertension. Age group of 21-30 years were 1.707 times likely to develop PIH compared to those in other age groups (O.R=1.707; 95% C.L=1.164-2.499, the age group 18-20 years had a statistically significant negative and defensive effect against development of PIH. Age group of 41 and above are 4.503 times likely to develop PIH. Those cohabiting were 15.851 times likely to develop PIH, (O.R=15.851; 95% C.L=6.183-40.637).

Primary education increased the odd of being a PIH case by 78%. Ordinary levels were 1.260. Certificate can increase the odd of being a PIH case by 58%. Probability of having PIH for those with diploma was 2%, whilst those with degrees were 5%.

Christians were 2.106 times likely to develop PIH (O.R=2.106; 95% C.L=1.354-3.275) than other religious sect and this relationship was statistically significant ( $p=0.001$ ). Apostolic sect were 52.130 times likely to developed PIH and was significantly higher than other religions and statistically significant at  $p < 0.05$ . Traditional

religion, 1.316 times likely to develop PIH (O.R=1.316; 95% C.L=0.547-3.168) compared to other forms of religion and this association was not statistically significant at  $p=0.347$ . Muslims were 2.179 times likely to develop PIH.

The formally employed were 1.312 times likely to develop PIH than those who were not, the association was not statistically significant ( $p=0.205$ ). The self-employed were 1.793 times likely to develop PIH as compared to those who were not (O.R=1.793; 95% C.L=1.032-3.115) and this relationship was statistically significant at  $p=0.026$ .

Gold panners were 6.164 times likely to develop PIH compared to those who were not (O.R=6.164; 95% C.L=1.334-28.474), this relationship was significant at  $p=0.008$ .

Farmers were 0.288 times likely to develop PIH than those who were not (O.R=0.288; 95% C.L=0.060-1.373), the association was not statistically significant at  $p=0.088$ . Housekeepers were 16.355 times more likely to develop PIH in contrast to those who were not (O.R=16.355; 95% C.L=2.120-126.160).

**Table 3. 1.1.** Knowledge on PIH among pregnant women

Variables	Cases				Controls			
	Yes		No		Yes		No	
	N	%	N	%	N	%	N	%
Are you aware of the signs and symptoms of PIH?	35	16.1	182	84	71	32.7	146	67.3
Are you aware of the complications of PIH?	36	16.6	181	83	54	25	163	75.1
Are you aware of the prevention of PIH complications?	52	24	165	76	62	29	155	71.4
Aware of the impact of PIH on the unborn baby?	66	30.4	151	67	139	64	122	56.2

Majority 182 (84%), among cases and 146 (67.3%) among controls were not aware of the signs and symptoms of PIH respectively. Majority, 181 (83%) among cases were not aware of the complications of PIH whereas 36 (17%) were aware. Most of the control group, 163 (75%) were not aware of the complications of PIH.

Majority among the cases, 165 (76%) and 155 (71.4%)

among the control group were not aware of the prevention of PIH complications. Few were aware, 52 (24%) and 22 (29%), cases and controls respectively. Of the 151(67%), among the cases were not aware of the impact of PIH on the unborn baby, whereas 139 (64%) of the control group were aware of the impact of PIH on the unborn baby whilst 122 (56.2%) were not aware.

Table 3.1.2: Knowledge constructs

Knowledge constructs	Agree				p-value	Disagree				p-value	Don't Know				p-value
	Cases (217)		Control (217)			Cases (217)		Control (217)			Cases (217)		Control (217)		
	N	%	N	%		N	%	N	%		N	%	N	%	
PIH can cause the death or serious illness of a pregnant mother if it is not managed	143	65.9	79	36.4	0.000 <sup>a</sup>	36	16.6	48	22.1	0.000 <sup>a</sup>	38	17.5	90	41.5	0.000 <sup>a</sup>
PIH can cause the death or serious illness of an unborn child if it is not managed	104	48	92	42.4	0.000 <sup>a</sup>	55	25.3	46	21.2	0.003 <sup>a</sup>	58	26.7	79	36.4	0.000 <sup>a</sup>
PIH can occur to any expectant mother	108	49.8	47	22	0.000 <sup>a</sup>	73	33.6	85	39.2	0.001 <sup>a</sup>	36	16.6	85	39.2	0.001 <sup>a</sup>
Drugs for managing PIH should be taken throughout the term of pregnancy	57	26.3	61	28.1	0.045 <sup>a</sup>	75	34.6	60	27.6	0.000 <sup>a</sup>	85	39.2	96	44.2	0.000 <sup>a</sup>
To experience PIH, women must have been hypertensive before the pregnancy	66	30.4	41	18.9	0.000 <sup>a</sup>	65	30	91	41.9	0.000 <sup>a</sup>	86	39.6	85	39.2	0.318 <sup>b</sup>
PIH conditions heal after delivery or a few weeks after delivery	78	35.9	41	18.9	0.000 <sup>a</sup>	58	26.7	52	24	0.014 <sup>a</sup>	81	37.3	124	57.1	0.000 <sup>a</sup>
With proper drug compliance a woman can effectively manage PIH and have a normal pregnancy and delivery	78	35.9	54	24.9	0.000 <sup>a</sup>	45	20.7	67	30.9	0.000 <sup>a</sup>	94	43.1	96	44.2	0.158 <sup>b</sup>

\*superscripts <sup>a</sup>=significant ( $p < 0.05$ ) <sup>b</sup>=not significant ( $p > 0.05$ )

The cases 143 (65.9%) agree that PIH can cause the death or serious illness of a pregnant mother if it is not managed, whilst, 36 (16.6%) disagreed and 38 (17.5%) did not know. Whereas, among the controls, 90 (41.5%) did not know that PIH can cause the death or serious illness of a pregnant mother if it is not managed and 79 (36.4%) who agreed, only 48 (22.1%) disagreed.

Among the cases 104 (48%) agreed that PIH can cause the death or serious illness of an unborn child if it is not managed followed by 58 (26.7%) who did not know and only 55 (25.3%) who disagreed. Control group, 92 (42.4%) agree that PIH can cause the death or serious illness of an unborn child if it is not managed and 79 (36.4%) who did not know. Of the 217 cases, 108 (49.8%) agree that, PIH can occur to all expectant mothers.

The study ascertained that 85 (39.2%) of cases did not know that drugs for managing PIH should be taken throughout the term of pregnancy while 75 (34.6%) disagreed and only 57 (26.3%) agreed. The control group, 96 (44.2%) did not know that, drugs for managing PIH should be taken throughout the term of pregnancy, 61 (28.1%) agreed and 60 (27.6%) disagreed.

The table also show that 86 (39.6%) cases did not know whether a woman must have been hypertensive before the pregnancy to experience PIH, 66 (30.4%) agreed whilst, 65 (30%) disagreed. Among the control group, 91 (41.9%) disagreed that for a woman to experience PIH, they must have been hypertensive before the pregnancy, 85 (39.2%) did not know and 41 (18.9%) disagreed.

Among the cases 81 (37.3%) did not know that PIH conditions heal after delivery or a few weeks after delivery, 78 (35.9%) agreed while 58 (26.7%) disagreed. Control group, 124 (57.1%) did not know that PIH conditions heal after delivery or a few weeks after delivery whereas 52 (24%) disagreed.

The case group 94 (43.1%) did not know that with proper drug compliance a woman can effectively manage PIH and have a normal pregnancy and delivery and 78 (35.9%) agreed while 45 (20.7%) disagreed. Whereas, 96 (44.2%) of the control group did not know that with proper drug compliance a woman can effectively manage PIH and have a normal pregnancy and delivery, 78 (35.9%) agreed and 67 (30.9%) disagreed.

### Discussion

Participants in the age group of 41 and above are 4.503 times likely to develop PIH compared to other age groups. This implies that, as the age increases, the chances of developing PIH also increases. The results agree with findings by Gudeta and Regassa, (2019) <sup>[14]</sup> who identified gestational age as a predictor of development of PIH.

Regarding marital status, participants who were single were 1.392 times likely to develop PIH whilst participants who were married were 1.096 times likely to develop PIH and the relationship was not statistically significant. This explicitly shows that being single, married or divorced has no positive effect on the development of PIH. Participants who were cohabiting were 15.851 times likely to develop PIH and were statistically significant implying that, there was a significant association between cohabiting and development of PIH. Robillard *et al.* (2003) <sup>[24]</sup> conducted a study in France and observed that for both primigravidae and multigravidae, length of sexual cohabitation before conception was inversely related to the incidence of pregnancy-induced hypertension ( $p < 0.0001$ ) therefore cohabiting increases the chances of developing PIH. This could be something tied to stress related to morality and legality of a union.

In this study participants who had primary education were 2.778 times likely to develop PIH and statistically



significant at  $p < 0.05$ . This shows that there is a strong positive relationship between education and PIH. This links well with Zimbabwe Demographic health survey report of 2015 that revealed that 27.1% of the people in Zimbabwe have not reached secondary education level. Another study in Nigeria showed that education has a positive association with utilization of Primary Health Care services (Sule *et al.*, 2015) [25]. In contrast, participants who had certificates were 2.888 times likely to develop PIH and statistically significant ( $p = 0.023$ ). This could most likely be attributed to domestic violence and abuse by their spouse. The study conducted by (Al-Hewiti, 2014) [3] indicated that low adherence was reported more among patients with higher level of education.

Concerning religion, participants who were Christians were 2.106 times likely to develop PIH and statistically significant ( $p = 0.001$ ). However the study noted that participants who were in the apostolic sect were 52.130 times likely to develop PIH and this was significantly higher than other religions. This could most probably be caused by various practices and beliefs which affect health seeking behaviour and also influence decision to seek medical attention thereby worsening the condition. During the FGD, most of the respondents believed that traditional ways of treatment is better than visiting health centres like hospitals and clinics. Some of the respondents mentioned that, drugs are man-made and as such they are not effective in managing PIH. In addition, such practices as the use of water to treat health problems also affect drug adherence leading to further complications of PIH.

This study revealed that participants who were formally employed were 1.312 times likely to develop PIH compared to those who were not whilst participants who were self-employed were 1.793 times likely to develop PIH and this relationship was statistically significant. Thus, being self-employed can have a positive significant association with the development of PIH. There are several factors which could lead to development of PIH among women who are self-employed which include, economic hardships, inadequate household income and food. The findings of this study harmonize with the findings by Klebanoff *et al.*, (2015) [17] who discovered that long working hours by pregnant women who are employed in a stressful environment had high incidence of developing PIH as compared to their unemployed counterparts who spent most of their time resting at home. Drake, (2014) [11], and Katz *et al.*, (1991) [16] also observed that job stress is associated with increased risk of PIH. Studies conducted by Ceron-Mirelles, (2010) [4] furthermore, discovered that working women had 2.3 times the risk of developing PIH compared to nonworking women (Klonoff, 2006) [18].

The study observed that gold panners were 6.164 times more likely to develop PIH in comparison to those who were not and this relationship was significant at  $p = 0.008$ . This could be attributed to working conditions which expose pregnant women to various health problems for instance ergonomic challenges since the job involves lifting of heavy loads and stress emanating from long working hours as well as exposure to chemicals. A study conducted by Feng Hu and Chan (2018) [12] showed a significant positive relationship between mercury and the risk of developing hypertension. Tapp, (2000) [28] also highlighted that

ergonomic stressors in the workplace have a negative impact on pregnant workers resulting in poor maternal outcomes.

The study results indicated that participants who were housekeepers were 16.355 times more likely to develop PIH and the association was statistically significant ( $p < 0.05$ ). This could be an attribute of low wages, stress from abusive householders and poor living conditions among others. Therefore, working conditions can predispose pregnant women to PIH. This corresponds with the study conducted by Ceron-Mirelles, (2010) [4] which showed that stress in pregnancy corroborates all physio-pathologic theories for PIH and Ceron-Mirelles (*ibid*), further avers that it is not necessarily the employment status that causes the development of PIH but instead it is the levels of stress experienced by an individual person at work.

### Knowledge of PIH among women

Majority 182 (84%), among cases and 146 (67.3%) among controls were not aware of the signs and symptoms of PIH respectively. Krishnan *et al.*, (2020) [19] concurs with the study results, in their study in India, they found out that, more than half of the mothers (63.6%) had average knowledge regarding PIH. This clearly shows that pregnant women do not have adequate knowledge on PIH which could be attributed to lack of access to maternal health education. This lack of knowledge however, could later on translate to weakening of recommended behaviours and practices that can save lives, thereby worsening PIH complications leading to an increase in morbidity and mortality. This could also be participants' failure to seek medical assistance due to religious practices.

Only few, 36 (17%) were aware of the PIH complications while, majority, 181 (83%) among cases were not aware. This is attributed to unavailability of resources such as flyers, pamphlets at most health institutions across the sampled sites which can be used to educate pregnant women on issues to do with PIH and hence there is a glaring gap in knowledge on PIH among pregnant women. Therefore, it is critical to provide the pregnant women with sufficient information on PIH complications so that they will be capable of recognizing clinical presentations early to facilitate appropriate and prompt action (Goshomi, 2012) [13].

Most of the participants among the cases, 165 (76%) and 155 (71.4%) among the control group were not aware of the prevention of PIH complications. This implies that majority of participants have limited or no access to PIH services and as such lack knowledge on measures that can be taken to manage PIH. The study also revealed that majority of participants 151 (67%), among PIH cases were not aware of the impact of PIH on the unborn baby. This concurs with a study conducted in Ethiopia where mothers who had knowledge of three or more neonatal danger signs (good knowledge) were found to be only 18.2% (95% CI 15.1, 21.3%) (Abiodun *et al.*, 2017) [1].

### Knowledge constructs

Majority of the cases 143 (65.9%) agree that PIH can cause the death or serious illness of a pregnant mother if it is not managed. This could be attributed to general knowledge that if a disease is not treated could cause death. The control

group showed that, 90 (41.5%) did not know that PIH can cause the death or serious illness of a pregnant mother if it is not managed and this explains why majority of participants lack knowledge on management of PIH, a challenge which is attributed to poor cultural and traditional beliefs and practices which hinder pregnant women from seeking medical attention. The results harmonize with findings by Al Ebrahimi, *et al.*, (2019) <sup>[2]</sup> who observed that almost half of the participants had a weak knowledge score (46.9%), thus there was a strong association between knowledge score and past medical history of PIH, past medical history of gestational diabetes and normal antenatal care visits. The findings of the study showed that the knowledge about PIH was poor among the pregnant participants hence there is need to increase public awareness and knowledge regarding PIH.

It was observed that, among the cases 104 (48%) agreed that PIH can cause the death or serious illness of an unborn child if it is not managed. This clearly shows that some pregnant women know the complications of PIH and they could have gained the knowledge from health professionals at their respective health centres. Hence knowledge is a key factor in proper management of PIH among pregnant women. This concurs with what was discovered in South Africa, Limpopo province that most of pregnant women had inadequate knowledge on the prevention of complications, as well as concerning the impact of PIH on an unborn baby (Maputle *et al.*, 2015) <sup>[20]</sup>.

Of the 217 participants among cases, 108 (49.8%) agree that, PIH can occur to any expectant mother followed by 73 (33.6%) who disagreed and only 36 (16.6%) who did not know. This could be attributed to insufficient information received by pregnant women in most health centres during ANC visits concerning PIH. Knowledge on PIH is important yet many studies showed that there is lack of knowledge in Sub-Saharan Africa (Vata *et al.*, 2015) <sup>[29]</sup>.

The study revealed that 85 (39.2%) of the participants among the cases did not know that drugs for managing PIH should be taken throughout the term of pregnancy. Similarly, 96 (44.2%) among the control group did not know that, drugs for managing PIH should be taken throughout the term of pregnancy. This however could most likely be attributed to attitude among pregnant women especially with regards to medication since some believe that medication can affect the unborn baby and as such they prefer other methods of treatment. In most developing nations patient's knowledge about their disease and treatment is not always sufficient. Another research conducted by Al-Hewiti (2014) <sup>[3]</sup>, showed that those patients with low adherence demonstrated that the information they received regarding their medications was less adequate when compared to patients with those who had high adherence. Therefore, lack of information is a major factor affecting pregnant women with PIH.

Results showed that most of the participants among the case group 94 (43.1%) and 96 (44.2%) of the control group, did not know that with proper drug compliance a woman can effectively manage PIH and have a normal pregnancy and delivery. The results agree with Maputle, *et al.*, (2015) <sup>[20]</sup> who conducted a study in South Africa, and observed that there was knowledge deficit among pregnant women about PIH symptoms, prevention of complications and its impact

on the unborn baby. A study by Darling and Jiji, (2014) <sup>[8]</sup> indicated that 55.1 % of the participants had sufficient information regarding PIH while 44.9% had too little knowledge concerning PIH, regardless of the percentage; lack of adequate knowledge concerning PIH has adverse effects on maternal and neonatal outcomes.

### Conclusion

This study revealed challenges regarding management of PIH, effects of PIH to the unborn baby as well as medication. Knowledge barriers, cultural and traditional beliefs that characterized attitude, practices and lack of support from spouses were mentioned as challenges affecting proper management of PIH. There is a need to improve approaches and management protocols for example, culture specific protocols for effective management of PIH. Participants with PIH lack knowledge on the causes of PIH and its management. Health care providers need to be trained in the management of PIH so as to help reduce adverse perinatal outcomes. Additionally, culture-specific health education is crucial to improve knowledge, attitude and practice of mothers with PIH in order to reduce the perinatal mortality and morbidity. Husbands and families should take an active role in the management of PIH. Peer educators can be trained to give health education and support to mothers affected by PIH.

### Conflict of Interest

No conflict of interest regarding the publication of this paper.

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