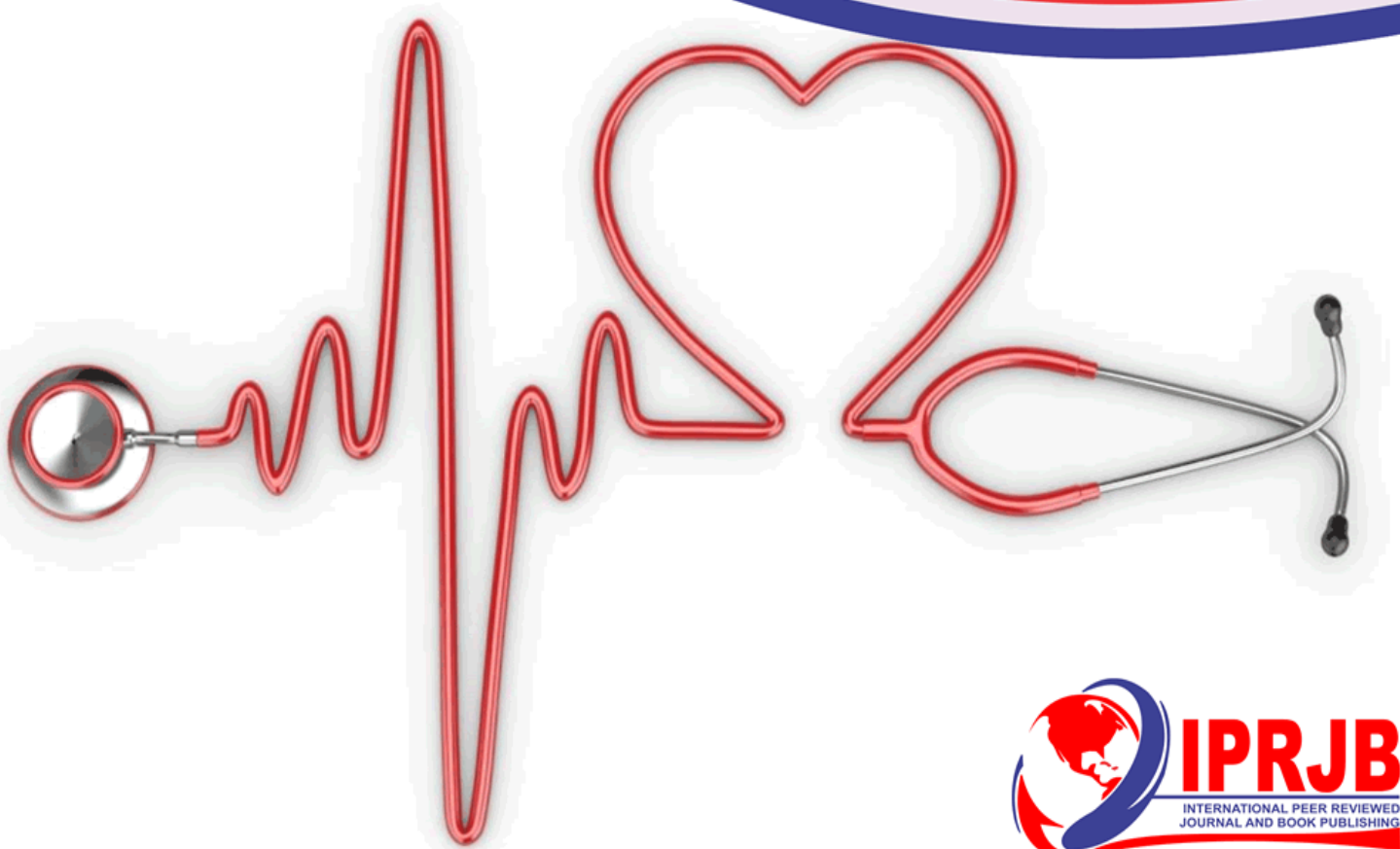


Journal of Health, Medicine and Nursing (JHMN)

PREVALENCE OF HYPERTENSIVE DISORDERS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CARE IN SELECTED PUBLIC HOSPITALS IN ADDIS ABABA, ETHIOPIA

Weynshet Teshome Firisa, Dr. Lister Onsongo PhD, RN and
Dr. Judy Mugo



**PREVALENCE OF HYPERTENSIVE DISORDERS AMONG
PREGNANT WOMEN ATTENDING ANTENATAL CARE IN
SELECTED PUBLIC HOSPITALS IN ADDIS ABABA,
ETHIOPIA**

^{1*} Weynshet Teshome Firisa

¹Post Graduate Student: Kenyatta University

*Corresponding Author's E-mail: weynshetfirisa@gmail.com

² Dr. Lister Onsongo PhD, RN

Community Health & Reproductive Health Nursing Department
Kenyatta University

² Dr. Judy Mugo

Dept. of Population, Reproductive Health and Community Resource
Management Kenyatta University

Abstract

Purpose: This study sought to assess the prevalence of hypertension in pregnancy and associated risk factors among women attending antenatal care clinics in selected Public Hospitals in Addis Ababa, Ethiopia.

Materials and Methods: The research employed a cross-sectional descriptive study design. Study population was pregnant women who attended ANC care in selected hospital. The respondents were randomly selected from Tikur Anbesa specialized, Zewditu Memorial and St. Paul's Millennium medical college hospitals. Respondents for interview were selected using systematic random sampling at an interval of nine until a sample size of 297 was reached. The study used an adopting both quantitative and qualitative data collection methods. Quantitative data was collected using structured questionnaires from pregnant women attending antenatal care clinics while qualitative data was collected using key informant interview schedules and Focused Group Discussion guides with Nurses in charge of antenatal care clinics and primary respondents respectively. Key informants and focused group discussants were purposively selected. Descriptive data was analysed using Statistical Package for Social Sciences version 20.0 with the aid of Microsoft Excel program to generate frequency tables, graphs and pie-charts. Qualitative data was analysed using thematic analysis and results triangulated with quantitative data as direct quotes or narrations. Inferential statistics were calculated using Chi-Square tests done at 95% confidence interval and a margin of error of 0.05 to establish the association between variables. Information generated were presented in the text in the form of tables, bar graphs and pie charts.

Results: The study results revealed that the prevalence of pregnancy induced hypertension in Addis Ababa was 21.9%. Socio-demographic factors such as age ($p=0.030$), occupation ($p=0.031$), income ($p=0.0014$), highest level of education ($p=0.001$) and health insurance ($p=0.001$) were significantly associated with occurrence of hypertension in pregnancy. Reproductive and obstetric factors such as age at first pregnancy ($p=0.001$), gravidity ($p=0.046$), parity ($p=0.001$), history of obesity ($p=0.001$) and occurrence of gestational diabetes ($p=0.002$) were significantly associated with hypertension in pregnancy. More than a half (51.9%) of respondents had negative attitude towards hypertensive disorder in pregnancy. The level of attitude ($p=0.040$) was significantly associated with occurrence of hypertension in pregnancy.

Unique contribution to theory, practice and policy: The study recommends that the management of the 3 health facilities together with other stakeholders in health empower women to start income generating projects to increase their financial access to antenatal care services consequently reduces hindrances that may lead to pregnancy complications such as hypertensive disorders in pregnancy.

Key words: *Hypertension, Pregnancy. Associated Risk Factors, Antenatal Care Clinics*

1.0 INTRODUCTION

In 2013 almost 300,000 maternal deaths occurred worldwide of which majority (62%) were from Sub-Saharan Africa (Duckitt *et al.*, 2017). HDP refers to group of Hypertensive disorders of pregnancy represent group of disorders related to high blood pressure they include preeclampsia, eclampsia, gestational hypertension, and chronic hypertension. Globally this condition account for 10 % of all pregnancies. According to the studies done in Africa maternal death due to HDP was around 9.1 %. In Ethiopia 19% of deaths were linked to Hypertensive disorder of pregnancy., making it a major public health (Sibai *et al.*, 2014).

The most serious consequences for the mother and the baby results from preeclampsia and eclampsia (Gaugler *et al.*, 2014). Several studies estimated that that 9.1 % of maternal deaths in Africa are due to HDP (Steegers *et al.*, 2010). HDP has remain main cause for maternal mortality and morbidity for last several decades. In addition, the exact cause of the condition is still unknown (Berg *et al.*, 2014). The problems associated with HDP are still affecting the health of the mother and the foetus as well. The course of the medical condition of mother with HDP is depend on the seriousness of the disease process (Saucedo *et al.*, 2013).

Preeclampsia is the commonest cause of maternal mortality in developing country which ranges from 1.8% to 16.7% (Asamoah *et al.*, 2011). According to study carried out in South Africa the occurrence of HDP approximated 9.8%. (Gaym *et al.*, 2011). Among all maternal deaths in developing country preeclampsia accounts 40%-60 % (Duckitt *et al.*, 2017). In the globe HDP is the leading cause of maternal mortality especially in poor countries (Nilsson *et al.*, 2015)

According to various study conducted there are different risk factors of HDP. Among them population growth is the main factor, also null-parity, extreme ages and behavioural risk factors like: unhealthy diet, hurtful use of alcohol, deficiency of physical exercise, overweight and sustained stress (Xiang *et al.*, 2012). Even though there is reduction in the rate HDP in the country, it remains a common pregnancy related cause of maternal death in Ethiopia (Dawson *et al.*, 2013). Hypertensive disorder of pregnancy is related with maternal mortality and morbidly in Ethiopia (Otieno, 2013).

Statement Problem

HDP is a public health problem globally (Cunningham *et al.*, 2014). Maternal mortality rate related to pregnancy is one in four thousand and one in ten thousand in developed country, whereas one in fifteen and one in fifty in low come country. (Gandhi *et al.*, 2014). The study conducted in 2015 shows that, MMR was 546/ 100,000 live birth in most SSA (Dekker *et al.*, 2016). Globally HDP accounts 10% of all pregnancies (Khan *et al.*, 2006). Among this around 40,000 women, mostly from developing.

HDP accounts for 19% of maternal death in Ethiopia (Sibai *et al.*, 2014). Study done in Ethiopia on 112 hospitals and 685 health centres showed that 1.2 percent of all institutional deliveries were complicated by preeclampsia or eclampsia (Wolde *et al.*, 2011). The cause-specific case fatality rate is 3.6 percent. Current EDHS 2016 reports maternal mortality ratio is 412; preeclampsia or eclampsia contributes about 19% of maternal deaths (Campbell *et al.*, 2014).

As different study shows Ethiopia revealed that the MMR was 676/100,000 live births (WHO, 2014). The study carried out in Addis Ababa, Ethiopia shows that the prevalence of HDP among pregnant women were around 5% which is the major public health challenge in the country (Saftlas *et al.*, 2014).

2.0 LITERATURE REVIEW

2.1 Overview of Hypertensive Disorder in Pregnancy

Hypertensive Disorder in Pregnancy has remained main cause for maternal mortality and morbidity for last several decades. In addition, the exact cause of the condition is still unknown (Berg *et al.*, 2014). The problems associated with HDP are still affecting the health of the mother and the foetus as well. The course of the medical condition of mother with HDP is depend on the seriousness of the disease process (Saucedo *et al.*, 2013). There are four categories chronic hypertension, preeclampsia gestational hypertension and eclampsia (Steegers *et al.*, 2010).

2.2 Socio-demographic factors

There are socio demographic factors which are related with development of hypertensive disorders among pregnant women. Different study shows that there are different factors that cause HDP, according to this study factors associated with HDP were first pregnancy, multiple pregnancy, age above 35years, overweight, family history of chronic illness like hypertension and diabetes, maternal history of hypertension and diabetes and early pregnancy and preeclampsia in a previous pregnancy, null parity, diabetes and chronic hypertension. Study findings have revealed that the risk of early pregnancy is 3.87 times compared to normal age for pregnancy. (Gandhi *et al.*, 2014).

In Bangladesh the mean age of the respondents was 22 years (Islam *et al.*, 2016). Other studies conducted have linked age at pregnancy with occurrence of hypertension in pregnancy. This is because advanced maternal age increases chances of hypertensive disorder in pregnancy. A study done on the relationship between gestational hypertension and advanced maternal age, the results revealed that getting pregnant at an older age predisposed one to HDP (Dietol & Juliane, 2015). In Harare, Zimbabwe, a study done among women seeking maternity services it was shown that majority of those with hypertensive disorder in pregnancy were of advanced ages (Muti *et al.*, 2015).

The level of income has also played a key role in accessing healthcare including antenatal services among pregnant women. In Sub-Saharan Africa including Ethiopia, most women are not employed hence depend on their spouses and other breadwinners. Different study revealed that it was reached that majority of the respondents were low-income earners (Ahmed *et al.*, 2017). Women who have high income levels are less likely to develop hypertensive disorder in pregnancy since they could afford to take preventive measures thus avoid hypertensive disorder in pregnancy.

Place of residence can also influence development of hypertensive disorder. According to another study done by Zhang *et al* (2017) on hypertensive disorders among pregnant with diabetes mellitus, it was also reported that majority of the respondents were middle earners hence

lived in rural areas. Religion also plays a crucial role in affecting utilization of ANC services since some religions advocate for usage of such services while others do not. According to a study done in Ngaoundere in Cameroon, majority of the respondents were Muslims (Mbouemboue *et al.*, 2016). The study done on HDP among women in Katsina State in Nigeria, it was revealed that majority of the respondents were Muslims (Azubuike & Danjuma, 2017).

2.3 Prevalence of Hypertensive Disorder in Pregnancy

A review of different literatures shows that the global prevalence of HDP account 10 % of all pregnancies (Cunningham *et al.*, 2014). (Saucedo *et al.*, 2013). In India study findings have shown that HDP accounts for 5% of maternal mortality which can be shown high prevalence of preeclampsia (Gandhi *et al.*, 2014). HDP is the main cause of maternal mortality in low come countries. Several studies estimated that that 9.1 % of maternal mortality in Africa are because of HDP (Berg *et al.*, 2010).

According to different study shows, in Africa among all pregnant who diagnosed of HDP 10% of the condition is because preeclampsia, which is greater than the world wide average of 7.5% (Garomssa *et al.*, 2011). This study shown that race matters for HDP which was approved as black women are more likely develop high blood pressure when compared to white women (Gaym *et al.*, 2011). This could be attributed to several factors which increases the likelihood of developing hypertension in pregnancy. However, studies done in western countries have shown low rates of hypertension in pregnancy as compared to less developed countries such as those in Africa. In another study done in Canada on hypertension in pregnancy among pregnant women, only 7.0% of the respondents developed hypertensive disorder in pregnancy (Butalia *et al.*, 2015). Another study done in Northern Karnataka hospital on hypertensive disorders and associated factors, it was further shown that only 5.13% of respondents had a hypertensive disorder in pregnancy (Bhat & Khard, 2019).

Globally there are high maternal death because of HDP as UN reported on 2010. Lack of awareness about HDP high among women who live in rural area of Ethiopia which lead them to death of pregnancy related complication (Sibai *et al.*, 2014). In Pune, India, majority of the respondents had high awareness (Patel *et al.*, 2016). According to a study done on awareness in rural hospital, majority of the respondents were not aware on their hypertensive disorder in pregnancy (George *et al.*, 2016).

2.4 Reproductive and obstetric factors

Reproductive and obstetric factors of a woman can also predispose her to HDP. There is certain medical complication of pregnancy among them HDP is the most common. Preeclampsia is the commonest cause of maternal death among others disorder categorized under HDP. Among total maternal death caused by HDP one/tenth is due to preeclampsia. Complication because preeclampsia occurs 3-5% of all pregnancy particularly in pregnant women with high risk like first pregnancy and chronic illness (Khan *et al.*, 2006). Study conducted in China showed that being overweight and having obesity increased risk of HDP

Research findings have shown that the first occurrence of menstruation cause the development of preeclampsia. Women who has menstruation by age less than twelve years have the greater risk

to have preeclampsia than women who had menstruation by age more than twelve years. There are also different percentage of occurrence among married women at age less than 18 years and above 18 years. Among pre-eclamptic cases woman who married at the age of less than 18 years accounts 80%. Regarding to gestational age, gestational age more than 30 weeks is the higher risk of HDP when compared to gestational age between 20-30 weeks (Ramesh *et al.*, 2014).

Study done in southern Brazil showed that, first pregnancy is the main cause of HDP with its frequency ranges between 2% and 7% in healthy primi-parous women. A study on the effects of maternal age and parity on maternal and neonatal outcomes associated age at first pregnancy as a risk factor for gestational hypertension (Schimmel *et al.*, 2015). Also, null parity was established cause of HDP based on logistic reverse survey. According to this study the first pregnancy twice more risk for developing of HDP (Sibai *et al.*, 2014). Occurrence of preeclampsia among pregnant Women with preeclampsia increases risk for deadly condition like acute renal failure, DIC, pulmonary oedema, hepatic failure or rupture, and placenta abruption and cerebral haemorrhage.

2.5 Attitude of women towards Hypertensive disorders in pregnancy

Attitude of women towards ANC can influence development of hypertensive disorders. The importance of attending ANC should be emphasized so as to encourage women for hospital deliveries. This is because attendance to antenatal services improves management of pregnancy where in case of complications, they are identified early thus could be managed well before they run out of hand. A study done on antenatal care utilization and content between low risk and high pregnancy outcomes, it was revealed that advice and services offered during ANC visits helped improve the pregnancy outcomes (Yeoh *et al.*, 2016). A research finding from Luanda, Angola revealed that pregnant women who attended ANC visits so that they can achieve better birth outcome (Nimi *et al.*, 2016). According to the World Health Organization, four ANC visits are recommended for pregnancies with complications so as to achieve positive pregnancy experience (WHO, 2016).

Myths and misconceptions have also played a key role whenever it comes to management of pregnancies especially in some cultures and religions. However, in urban area where access to information is not a barrier these have been dispelled thus enhancing use of antenatal care services. Dispelling myths on ANC services affects its utilization in some parts of the world thus ensuring that pregnant women can freely access such services whenever required (Barasa *et al.*, 2015).

Hypertension especially among young pregnant women has been associated with stigma and discrimination as many of them feel embarrassed to express their status at such an early age. This affects antenatal care service utilization since many of them shy off. According to research findings among pregnant adolescents in KwaZulu-Natal, South Africa, it was reported that young mothers would attempt to conceal their hypertension due to possible embarrassment and judgment from their peers (Govender *et al.*, 2018). In Northern Ethiopia, majority of the respondents felt social embarrassment and fear due to developing hypertensive disorders in pregnancy (Yuniarini, 2017). A study done in Kurdisatan region of Iraq among pregnant women,

it was concluded that majority of the respondents did not feel embarrassed due to developing hypertensive disorders in pregnancy during their gestation periods (Haji, 2018).

2.2 Conceptual Framework

Several factors play a role in determining in hypertension in pregnancy among pregnant women. These factors may inter-relate and may contribute to hypertensive disorder in pregnancy, which in return are eventually reflected by indicators such as maternal mortality and infant mortality rate

Independent variables

Socio-demographic factors

- Age
- Level of education
- Marital status
- ...

Reproductive and obstetric factors

- age at first pregnancy,
- gravidity
- gestational age in weeks
- history of infertility

Attitude towards Hypertensive disorders

- Attitude of confirmed cases,
- Attitude towards testing and treatment,
- Stigma
- Attitude towards ANC services
- Self-vulnerability

Dependent variable

Prevalence of Hypertension in Pregnancy

- Yes
- No

Figure 1: Conceptual Framework

3.0 METHODOLOGY

The research employed a cross-sectional descriptive study design. Study population was pregnant women who attended ANC care in selected hospital. The respondents were randomly selected from Tikur Anbesa specialized, Zewuditu Memorial and St. Paul's Millennium medical college hospitals. Respondents for interview were selected using systematic random sampling at an interval of nine until a sample size of 297 was reached. The study used an adopting both quantitative and qualitative data collection methods. Quantitative data was collected using structured questionnaires from pregnant women attending antenatal care clinics while qualitative data was collected using key informant interview schedules and Focused Group Discussion guides with Nurses in charge of antenatal care clinics and primary respondents respectively. Key informants and focused group discussants were purposively selected. Descriptive data was analysed using Statistical Package for Social Sciences version 20.0 with the aid of Microsoft Excel program to generate frequency tables, graphs and pie-charts. Qualitative data was analysed using thematic analysis and results triangulated with quantitative data as direct quotes or narrations. Inferential statistics were calculated using Chi-Square tests done at 95% confidence interval and a margin of error of 0.05 to establish the association between variables. Information generated were presented in the text in the form of tables, bar graphs and pie charts

4.0 RESULTS

4.1 Descriptive Analysis

4.1.1 Socio-demographic characteristics of respondents

The results showed that 131 (44.1%) of the respondents aged between 25-34 years followed by 101 (34.0%) of those who were aged between 15-24 years. Majority 191 (64.3%) of the respondents were married followed by 77 (25.9%) of the respondents who were single. Regarding the respondents' occupation, results revealed that less than half 125 (42.1%) of them were unemployed followed by 113 (28.0%) who were self-employed.

Concerning the respondents' religion, results showed that more than half 161 (54.2%) belonged to the Orthodox followed by 89 (30.0%) of them who were Muslims. Less than half 119 (40.1%) of the respondents had no formal education followed by 83 (27.9%) who picked between Grade 1-8 as their highest level of education attained. Regarding the respondents' level of family income, results showed that slightly less than half 131 (44.1%) of them earned ETB 3,000(74.63USD) and below followed by 83 (27.9%) of the respondents who earned between ETB 3,001-5,000 (74.56-123.95 USD).

The results further revealed that almost half 148 (49.8%) of the respondents belonged to the Oromo ethnic community followed by 77 (25.9%) of those belonging to the Amhara ethnic community. On whether the respondents had any form of health insurance, results indicated that majority 184 (62.0%) of the respondents did not have any health insurance while the rest 113 (38.0%) who reported to have some form of insurance.

Table 1: Distribution of socio-demographic characteristics among respondents (n=297)

Variable	Respondent response	Frequency (N)	Percentage (%)
Age in years	15-24	101	34.0
	25-34	131	44.1
	35-44	47	15.8
	≥ 45	18	6.1
Marital status	Single	77	25.9
	Married	191	64.3
	Divorced/separated	12	4.0
	Widowed	17	5.7
Occupation	Employed	59	19.9
	Unemployed	125	42.1
	Self-employed	113	38.0
Religion	Orthodox	161	54.2
	Muslim	89	30.0
	Protestant	47	15.8
Highest level of education attained	No formal education	119	40.1
	Grade 1-8	83	27.9
	Grade 9-10	65	21.9
	Over grade 10 th	30	10.1
Level of family income in ETB	≤ 3,000	131	44.1
	3,001-5,000	83	27.9
	5001-10000	54	18.2
	>10,001	29	9.8
Ethnicity	Amhara	77	25.9
	Oromo	148	49.8
	Tigre (Tigrayan)	30	10.1
	Somali	30	10.1
	Sidama	12	4.0
Health insurance	Yes	113	38.0
	No	184	62.0

4.1.2 Influence of socio-demographic factors on hypertensive disorders in pregnancy

Results revealed that 107 (81.7%) of the those who were aged between 25-34 years did not suffer HDP. Age was associated with HDP among the respondents ($p=0.030$). Most 160 (83.8%) of the respondents who were not married did not suffer from HDP. There was an no association between marital status and HDP ($p=0.051$).

Concerning the occupational status of the respondents, results showed that 47 (79.7%) of the respondents who were employed did not suffer from HDP. There was a statistically significant association between respondents' occupation and HDP ($p=0.031$). Majority 149 (92.5%) of the respondents who belonged to the Orthodox did not suffer from HDP. There was no statistically significant association between respondents' religion and HDP ($p=0.331$).

Majority 53 (81.5%) of the respondents who had attained between Grade 9-10 had not suffered HDP. There was a significant statistical association between highest level of education attained

and prevalence of HDP ($p=0.001$). Regarding the respondent's level of family income, results showed that majority 24 (82.8%) of the respondents who earned more than ETB 10,001 did not suffer HDP. There was a significant statistical association between level of family income and prevalence of HDP among the respondents ($p=0.014$). Most 135 (91.2%) of the respondents who did not suffer HDP were from the Oromo ethnic community. There was no significant statistical association between the respondents' ethnicity and prevalence of HDP ($p=0.217$). Further results indicated that majority 148 (80.4%) of the respondents who suffered HDP did not have any health insurance. There was a significant statistical association between having a health insurance and prevalence of HDP ($p=0.001$).

Table2: Association between socio-demographic factors and hypertensive disorders in pregnancy among respondents (n=297)

Independent variable	Respondent response	Dependent variable (Hypertension in pregnancy)		Statistical significance
		Yes (N=65)	No (N=232)	
Age in years	15-24	18(17.8%)	83(82.2%)	$\chi^2=18.939$ df=3 p=0.030
	25-34	24(18.3%)	107(81.7%)	
	35-44	17(36.2%)	30(63.8%)	
	≥ 45	6(33.3%)	12(66.7%)	
Marital status	Single	18(23.4%)	59(76.6%)	$\chi^2=22.726$ df=3 p=0.051
	Married	31(16.2%)	160(83.8%)	
	Divorced/separated	5(41.7%)	7(58.3%)	
	Widowed	11(64.7%)	6(35.3%)	
Occupation	Employed	12(20.3%)	47(79.7%)	$\chi^2=22.211$ df=2 p=0.031
	Unemployed	29(23.2%)	96(76.8%)	
	Self-employed	24(21.2%)	89(78.8%)	
Religion	Orthodox	12(7.5%)	149(92.5%)	$\chi^2=7.009$ df=2 p=0.331
	Muslim	30(33.7%)	59(66.3%)	
	Protestant	23(48.9%)	24(51.1%)	
Highest level of education attained	No formal education	31(26.7%)	85(73.3%)	$\chi^2=22.261$ df=3 p=0.001
	Grade 1-8	16(19.3%)	67(80.7%)	
	Grade 9-10	12(18.5%)	53(81.5%)	
	Over grade 10 th	6(20.0%)	24(80.0%)	
Level of family income in ETB	≤ 3,000	36(27.5%)	95(72.5%)	$\chi^2=15.447$ df=3 p=0.014
	3,001-5,000	7(8.4%)	76(91.6%)	
	5001-10000	17(31.9%)	37(68.5%)	
	>10,001	5(17.2%)	24(82.8%)	
Ethnicity	Amhara	26(33.8%)	51(66.2%)	$\chi^2=7.090$ df=4 p=0.217
	Oromo	13(8.8%)	135(91.2%)	
	Tigre (Tigrayan)	11(36.7%)	19(63.3%)	
	Somali	9(30.0%)	21(70.0%)	
	Sidama	6(50.0%)	6(50.0%)	
Health insurance	Yes	29(25.7%)	84(74.3%)	$\chi^2=21.523$ df=1 p=0.001
	No	36(19.6%)	148(80.4%)	

4.2 Prevalence of hypertensive disorders in pregnancy

4.2.1 Occurrence of hypertensive disorders in pregnancy

The study sought to establish the occurrence of HDP among respondents in the selected hospitals in Addis Ababa. The results showed that majority 232 (78.1%) of the respondents did not suffer HDP followed by 65 (21.9%) who suffered the HDP.

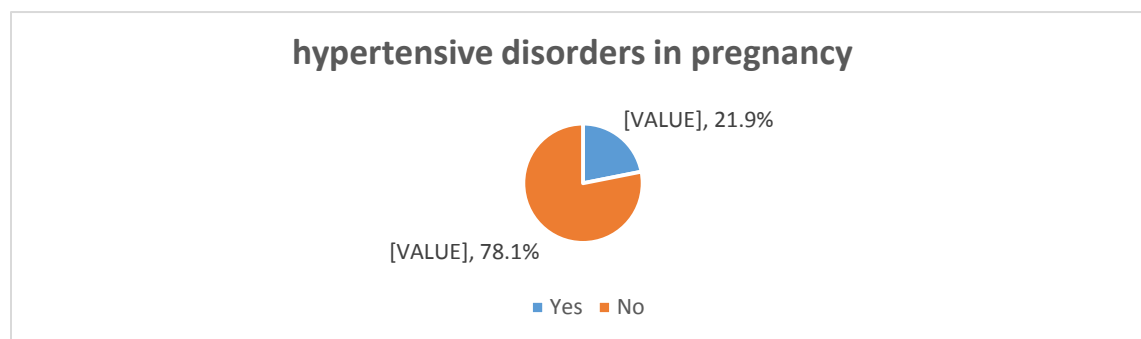


Fig 2: Prevalence of hypertensive disorders in pregnancy among respondents

4.2.2 Awareness of hypertensive disorders in pregnancy

The study sought to find out whether were aware of their status among the respondents who suffered HDP, the results revealed that majority 41 (63.1%) of the respondents were aware while the rest 24 (36.9%) were not aware of their status with regards to the condition.

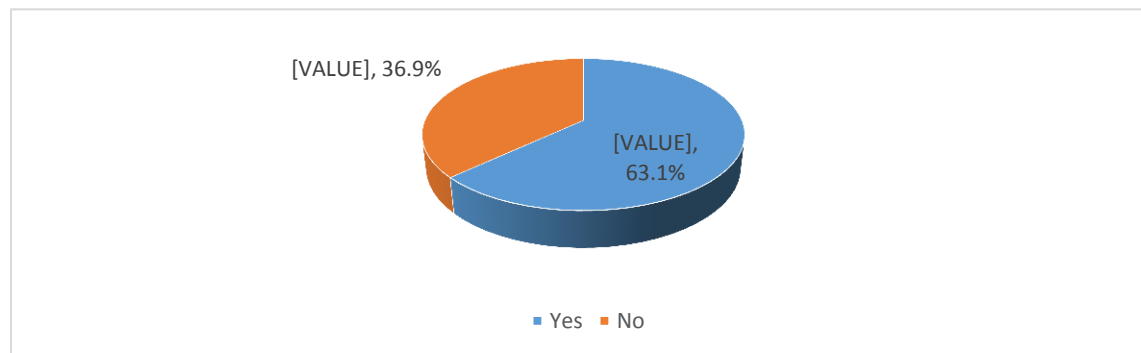


Fig 3: Awareness of hypertensive disorders in pregnancy

4.3.3 History of hypertensive disorders in pregnancy

Regarding the respondents' history of HDP, results showed that majority 196 (66.0%) of the respondents did not have history of the condition while the rest 101 (34.0%) had some history with the condition.

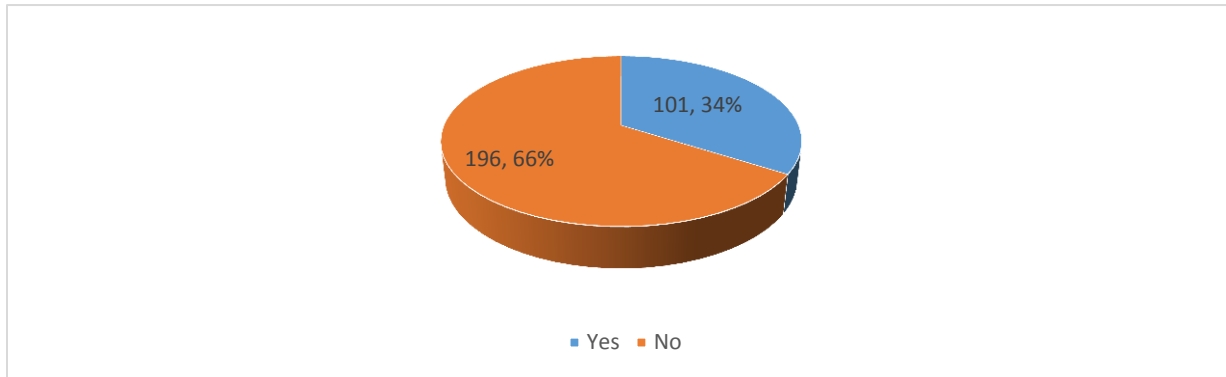


Fig 4: History of hypertensive disorders in pregnancy

4.2.4 Family history of hypertensive disorders in pregnancy

The study sought to find out whether there was an history of HDP within the respondents’ family. Results showed that 131 (44.1%) of the respondents could not tell whether there was history of the condition or not followed by 101 (34.0%) who had an history of the condition within their families.

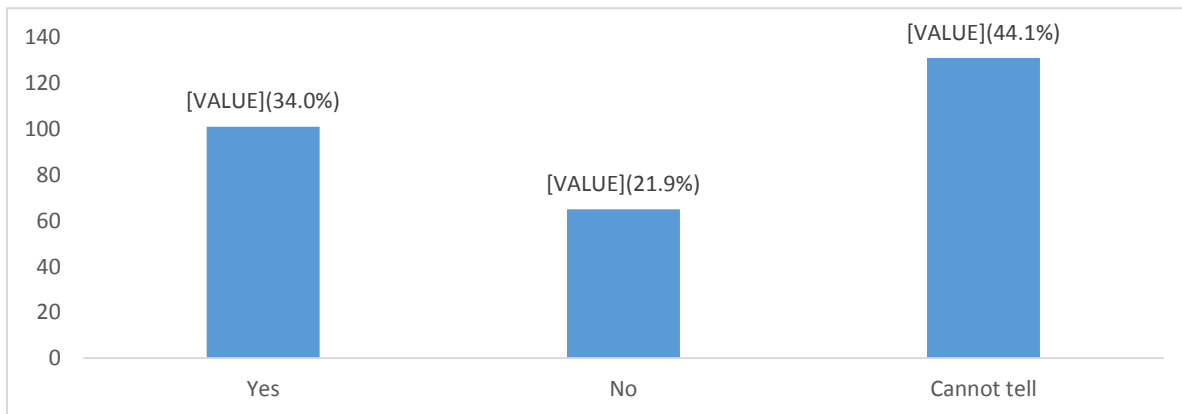


Fig 5: Family history of hypertensive disorders in pregnancy

4.2.5 Ever been tested for hypertension before

Majority 190 (64.0%) of the respondents revealed that they had never been tested for HDP with the rest 107 (34.0%) of them reporting that they had been tested for the condition before.

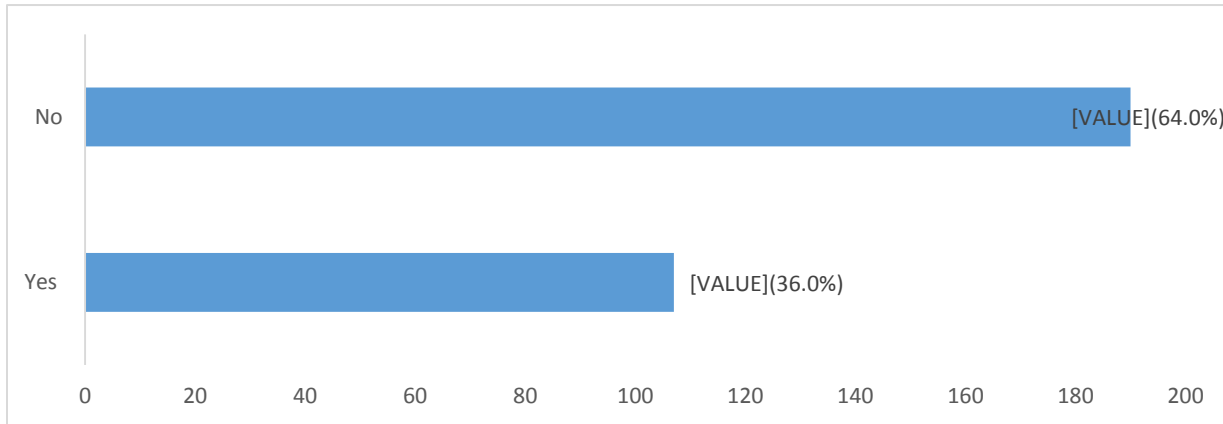


Fig 6: Ever been tested for hypertension before

4.2.6 Alcohol intake during pregnancy

On whether the respondents had taken alcohol during pregnancy, results indicated that majority 220 (74.1%) of the respondents had not taken any alcohol with the rest 77 (25.9%) having taken some form of alcohol in the course of their pregnancy.:

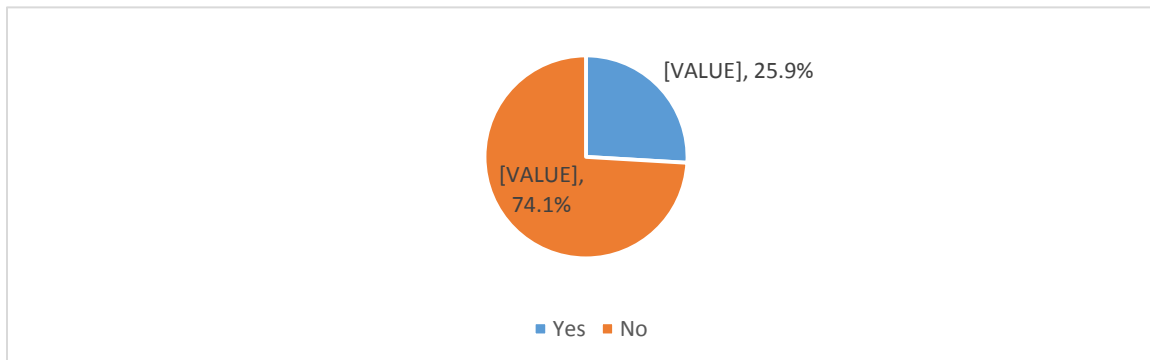


Fig 7: Alcohol intake during pregnancy

4.3 Reproductive and obstetric factors

4.3.1 Reproductive and obstetric factors associated with hypertensive disorders in pregnancy

The study sought to find out the reproductive and obstetric factors associated with HDP. The results revealed that most 208 (70.0%) of the pregnant women had planned for their pregnancy while the rest 89 (30.0%) had not planned. Regarding the age at first pregnancy results showed that 124 (41.8%) of the respondents had their first pregnancy when aged between 25-34 years followed by 113 (38.0%) who got pregnancy when aged between 15-24 years.

Concerning the respondents' gravidity, results showed that more than a third 113 (38.0%) of the respondents had been pregnant two times followed by 95 (32.0%) who had been pregnancy three times. Majority 243 (81.8%) of the respondents had not changed paternity after their first pregnancy while the rest 54 (18.2%) had changed paternity. Most 261 (87.9%) of the

respondents had no history of infertility while the rest 36 (12.1%) reported some history of infertility.

Regarding the respondents' parity results indicated that slightly more than a third 101 (34.0%) of the respondents had delivered once followed by 89 (30.0%) who were nulliparous. Majority 255 (85.9%) of the respondents did not report history of being obese while the rest 42 (14.1%) reported to have ever been obese in their lifetime. Further results revealed that most 267 (89.9%) of the respondents had not suffered gestational diabetes while the rest 30 (10.1%) reported to have suffered the condition.

Table 3: Distribution of reproductive and obstetric factors among respondents (n=297)

Independent Variable	Respondent response	Frequency (N)	Percentage (%)
Status of pregnancy	Planned	208	70.0
	Unplanned	89	30.0
Age at first pregnancy in years	15-24	113	38.0
	25-34	124	41.8
	35-44	48	16.2
	≥	12	4.0
Gravidity (Number of times a woman has been pregnant)	1	59	19.9
	2	113	38.0
	3	95	32.0
	≥4	30	10.1
Change of paternity after previous pregnancy	Yes	54	18.2
	No	243	81.8
History of infertility	Yes	36	12.1
	No	261	87.9
Parity (Number of times a woman has given birth)	Nulliparous	89	30.0
	1 Delivery	101	34.0
	2 Deliveries	83	27.9
	≥ 3 Deliveries	24	8.1
History of being obese	Yes	42	14.1
	No	255	85.9
Occurrence of gestational diabetes	Yes	30	10.1
	No	267	89.9

4.3.2 Influence of reproductive and obstetric factors on hypertensive disorders in pregnancy

The study sought to determine the influence of reproductive and obstetric factors on prevalence of HDP. The results showed that majority 167 (80.3%) of the respondents who had planned their pregnancy did not suffer HDP. There was no significant statistical association between status of pregnancy and prevalence of HDP ($p=0.166$). Most 106 (85.5%) of the respondents who got their first pregnancy when aged between 25-34 years did not suffer HDP. There was a significant statistical association between age at first pregnancy and prevalence of HDP.

Concerning the respondents' gravidity results showed that majority 23 (76.7%) of the respondents who had been pregnancy four times and more did not suffer HDP. There was a statistically significant association between the respondents' gravidity and prevalence of hypertension in pregnancy ($p=0.046$). Most 106 (74.1%) of the respondents who had not changed

the paternity after their previous pregnancy did not suffer HDP. There was a significant statistical association between change of paternity after previous pregnancy and prevalence of HDP ($p=0.024$).

Majority 212 (81.2%) of the respondents who had no history of infertility did not suffer HDP. There was no statistically significant association between history of infertility and prevalence of HDP ($p=0.522$). Regarding the respondents' parity, results showed that most 84 (94.4%) of the respondents who were nulliparous did not suffer hypertension in pregnancy. There was a statistically significant association between parity and prevalence of HDP ($p=0.001$).

Results revealed that most 208 (81.6%) of the respondents who had no reported history of being obese did not suffer HDP. There was a statistically significant association between being obese and occurrence of HDP ($p=0.001$). Further results showed that 219 (82.0%) of the respondents who had reported not to have suffered gestational diabetes did not suffer HDP. There was a statistically significant association between occurrence of gestational diabetes and hypertension in pregnancy ($p=0.002$).

Table 4: Distribution of reproductive and obstetric factors among respondents (n=297)

Independent Variable	Respondent response	Dependent variable (Hypertension in pregnancy)		Statistical significance
		Yes (N=65)	No (N=232)	
Status of pregnancy	Planned	41(19.7%)	167(80.3%)	$\chi^2=1.919$ df=1 p=0.166
	Unplanned	24(27.0%)	65(73.0%)	
Age at first pregnancy in years	15-24	36(31.9%)	77(68.1%)	$\chi^2=23.476$ df=3 p=0.001
	25-34	18(14.5%)	106(85.5%)	
	35-44	6(12.5%)	42(87.5%)	
	≥45	5(41.7%)	7(58.3%)	
Gravidity (Number of times a woman has been pregnant)	1	11(18.6%)	48(81.4%)	$\chi^2=11.568$ df=3 p=0.046
	2	29(25.7%)	84(74.3%)	
	3	18(18.9%)	77(81.1%)	
	≥4	7(23.3%)	23(76.7%)	
Change of paternity after previous pregnancy	Yes	28(51.9%)	26(48.1%)	$\chi^2=5.059$ df=1 p=0.024
	No	37(25.9%)	106(74.1%)	
History of infertility	Yes	16(44.4%)	20(55.6%)	$\chi^2=0.653$ df=1 p=0.522
	No	49(18.8%)	212(81.2%)	
	Nulliparous	5(5.6%)	84(94.4%)	
	1 Delivery	9(8.9%)	92(91.1%)	
Parity (Number of times a woman has given birth)	2 Deliveries	35(42.2%)	48(57.8%)	p=0.001
	≥ 3 Deliveries	16(66.7%)	8(33.3%)	
	History of obesity	Yes	18(42.9%)	
No	47(18.4%)	208(81.6%)		
Occurrence of gestational diabetes	Yes	17(56.7%)	13(43.3%)	$\chi^2=9.350$ df=1 p=0.002
	No	48(18.0%)	219(82.0%)	

4.4 Attitude towards hypertensive disorders in pregnancy

4.4.1 Responses on attitude towards hypertensive disorders in pregnancy

Regarding attitude, the respondents were given seven (7) statements on a Likert scale of scores between 1-4 where “1” means strongly disagree and “4” means strongly agree. The results revealed that more than half 173 (58.2%) of the respondents of which 96 (32.3%) disagreed and 77 (25.9%) strongly disagreed that myths and misconceptions could not hinder them from using antenatal care. Regarding whether respondents believed antenatal care visits improved pregnancy outcomes, results showed that 178 (60.0%) of the respondents of which 98 (33.0%) strongly agreed and 80 (27.0%) agreed that it indeed improved outcomes.

Slightly more than half 154 (51.8%) of the respondents of which 83 (27.9%) strongly disagreed and 71 (23.9%) disagreed that they will not feel embarrassed if they got diagnosed with HDP. Majority 201 (67.6%) of the respondents of which 107 (36.0%) strongly disagreed and 94 (31.6%) disagreed that they thought they could get hypertensive disorders in pregnancy. More than half 172 (57.9%) of the respondents of which 95 (32.0%) disagreed and 77 (25.9%) strongly disagreed that HDP could be managed.

Most 185 (62.2%) of the respondents of which 102 (34.3%) disagreed and 83 (27.9%) strongly disagreed that there was lot they could do to prevent themselves from HDP. Slightly more than half 160 (53.8%) of the respondents of which 83 (27.9%) strongly agreed and 77 (25.9%) agreed that being screened for HDP was not a waste of time.

Table 5: Responses on attitude towards hypertensive disorders in pregnancy among respondents (n=297)

Independent Variable	Respondent response			
	Strongly disagree	Disagree	Agree	Strongly agree
Myths and misconceptions cannot hinder me from using antenatal care	77(25.9%)	96(32.3%)	59(19.9%)	65(21.9%)
Antenatal care visits improve pregnancy outcomes	47(15.8%)	72(24.2%)	80(27.0%)	98(33.0%)
I won't feel embarrassed I get diagnosed with hypertensive disorders in pregnancy	83(27.9%)	71(23.9%)	66(22.2%)	77(25.9%)
I think I can hypertensive disorders in pregnancy	107(36.0%)	94(31.6%)	42(14.1%)	54(18.2%)
hypertensive disorders in pregnancy can be managed	77(25.9%)	95(32.0%)	54(18.2%)	71(23.9%)
There is a lot I can do to prevent me from hypertensive disorders in pregnancy	83(27.9%)	102(34.3%)	47(15.8%)	65(21.9%)
Being screened for hypertensive disorders in pregnancy is not a waste of time	78(26.3%)	59(19.9%)	77(25.9%)	83(27.9%)

4.4.2 Level of attitude towards hypertensive disorders in pregnancy

This section consists of results on attitude towards HDP among respondents. The seven (7) statements concerning attitude had a minimum score of 7 and maximum score of 28. The scores were further divided into two categories. Negative attitude ranged from 7-17 and positive attitude

ranged from 18-28. The results revealed that slightly more than half 154 (51.9%) of the respondents had negative attitude while the rest 143 (48.1%) had positive attitude towards HDP.

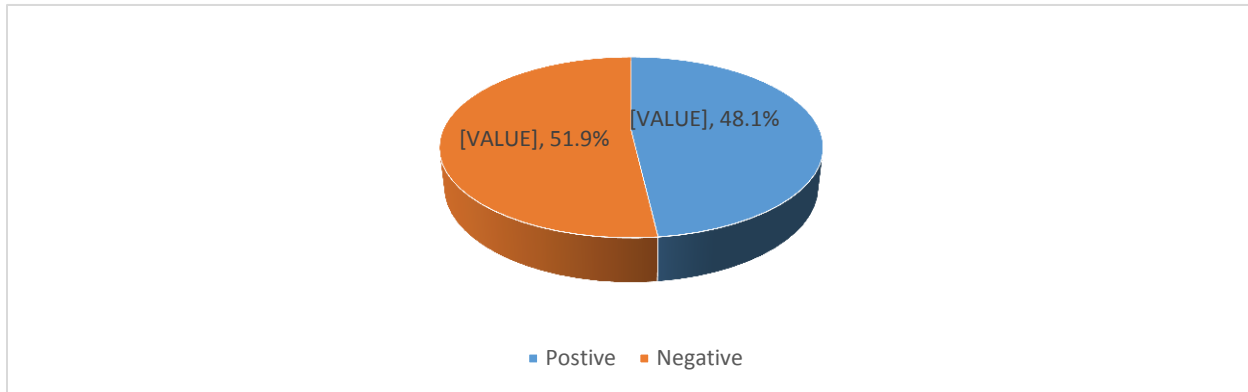


Fig 8: Level of attitude towards hypertensive disorders in pregnancy among respondents

4.4.3 Influence of attitude level on hypertensive disorders in pregnancy

The study sought to determine the influence of level of attitude towards HDP. The results revealed that majority 119 (83.2%) of the respondents who had positive attitude towards HDP did not suffer the condition. There was a significant statistical association between level of attitude and prevalence of HDP.

Table 6: Association between attitude level and hypertensive disorders in pregnancy among respondents (n=297)

Independent variable	Respondent response	Dependent variable (Hypertension in pregnancy)		Statistical significance
		Yes (N=65)	No (N=232)	
Level of attitude	Negative	41(26.6)	113(73.4%)	$\chi^2=4.200$ df=1 p=0.040
	Positive	24(16.8%)	119(83.2%)	

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The study results revealed that the prevalence of pregnancy induced hypertension in Addis Ababa was 21.9%. Socio-demographic factors such as age (p=0.030), occupation (p=0.031), income (p=0.0014), highest level of education (p=0.001) and health insurance (p=0.001) were significantly associated with occurrence of hypertension in pregnancy. Reproductive and obstetric factors such as age at first pregnancy (p=0.001), gravidity (p=0.046), parity (p=0.001), history of obesity (p=0.001) and occurrence of gestational diabetes (p=0.002) were significantly associated with hypertension in pregnancy. More than a half (51.9%) of respondents had negative attitude towards hypertensive disorder in pregnancy. The level of attitude (p=0.040) was significantly associated with occurrence of hypertension in pregnancy.

Conclusion

The study concludes that majority of socio-demographic factors influenced occurrence of hypertensive disorders in pregnancy among pregnant women in selected hospitals in Addis Ababa, Ethiopia. They included age, occupation, highest level of education attained, level of family income and health insurance. The fact that health insurance may enable women to access other preventive measures to avoid development of hypertensive disorders in pregnancy.

The findings of this study showed that the overall prevalence of hypertensive disorders in pregnancy was 21.9% among pregnant women in selected hospitals in Addis Ababa in Ethiopia. Majority of the respondents were aware about hypertensive disorders in pregnancy. Most of the respondents reported that they did not have a family history of hypertensive disorders in pregnancy.

The study further concludes that most of the reproductive and obstetric factor played a key role in the occurrence of hypertensive disorders in pregnancy. These were; age at first pregnancy, gravidity, change of paternity after previous pregnancy, history of obesity and occurrence of gestational diabetes.

Finally, the study concludes that the overall attitude towards hypertensive disorders in pregnancy was. Attitude level influenced occurrence pregnancy induced hypertension among pregnant women in selected hospitals in Addis Ababa, Ethiopia.

Recommendations

The study recommends that the management of the 3 health facilities together with other stakeholders in health empower women to start income generating projects to increase their financial access to antenatal care services consequently reduces hindrances that may lead to pregnancy complications such as hypertensive disorders in pregnancy. The study recommends that the county the management of the 3 health facilities together with management of hospitals should scale up promotion messages focusing awareness on hypertensive disorders in pregnancy and the preventive measures such as doing physical exercises to avoid sedentary lifestyles that could lead to occurrence of hypertensive disorders in pregnancy. The study further recommends that the management of the 3 health facilities to sensitize people on the importance of giving birth at ages less than 35 years to avoid the risk of developing the condition at older ages. Finally, the study recommends that the management of the 3 health facilities together with other stakeholders to dispel myths and disbeliefs associated with hypertensive disorders in pregnancy thus improve the attitude towards the condition so that people can adopt preventive measures to curb hypertensive disorders in pregnancy among women at risk.

REFERENCES

- Ahimbola J., Makanjuola A., Ganiyu S., Babatunde U., Adekunle DK., Olatayo A., (2016). Pattern of utilization of ante-natal and delivery services in a semi-urban community of north-Central Nigeria. *Afr Health Sci.*; (962–71)
- Ahmed, S. S., Sultana, N., Begum, M. L., Lima, L. S., Abedin, M. F., & Hosen, M. K. (2017). Pregnancy induced hypertension and associated factors among pregnant women. *Journal of*

Gynecology and Women's Health Volume 2 Issue, 4.

- Alsnes, I. V., Vatten, L. J., Fraser, A., Bjørngaard, J. H., Rich-Edwards, J., Romundstad, P. R., & Åsvold, B. O. (2017). Hypertension in pregnancy and offspring cardiovascular risk in young adulthood: prospective and sibling studies in the HUNT study (Nord-Trøndelag Health Study) in Norway. *Hypertension*, 69(4), 591-598.
- Amer, L., Kausar, R., & Khurshid, R. (2015). Family History is an early Predictor of Obesity, Diabetes and Hypertension in adults. *PAKISTAN JOURNAL OF MEDICAL & HEALTH SCIENCES*, 9(3), 888-891.
- Amugsi, D. A., Dimbuene, Z. T., Mberu, B., Muthuri, S., & Ezeh, A. C. (2017). Prevalence and time trends in overweight and obesity among urban women: an analysis of demographic and health surveys data from 24 African countries, 1991–2014. *BMJ open*, 7(10), e017344.
- Ananth, C. V., Skjaerven, R., & Klunssoyr, K. (2015). Change in paternity, risk of placental abruption and confounding by birth interval: a population-based prospective cohort study in Norway, 1967–2009. *BMJ open*, 5(2), e007023.
- Asamoah B., Moussa K., Stafström M., Musinguzi G., (2011): *Distribution of causes of Maternal mortality among different socio-demographic groups in Ghana*; a descriptive study. *BMC Public Health*. (11:159).
- Avcı, M. E., Şanlıkan, F., Celik, M., Avcı, A., Kocaer, M., & Göçmen, A. (2015). Effects of maternal obesity on antenatal, perinatal and neonatal outcomes. *The Journal of Maternal-Fetal & Neonatal Medicine*, 28(17), 2080-2083.
- Ayele, G., Lemma, S., & Agedew, E. (2016). Factors associated with hypertension during pregnancy in Derashie Woreda South Ethiopia, case control. *Qual Prim Care*, 24(5), 207-213.
- Azubuiké, S., & Danjuma, I. (2017). Hypertension in pregnancy among rural women in Katsina State, Nigeria. *Journal of Basic and Clinical Reproductive Sciences*, 6(1).
- Badge, V. L., Pandey, M., Solanki, M. J., & Shinde, R. R. (2016). A cross-sectional study of migrant women with reference to their antenatal care services utilization and delivery practices in an urban slum of Mumbai. *Journal of family medicine and primary care*, 5(4), 759.
- Barakat, R., Pelaez, M., Cordero, Y., Perales, M., Lopez, C., Coteron, J., & Mottola, M. F. (2016). Exercise during pregnancy protects against hypertension and macrosomia: randomized clinical trial. *American journal of obstetrics and gynecology*, 214(5), 649-e1.
- Barasa, K. S., Wanjoya, A. K., & Waititu, A. G. (2015). Analysis of determinants of antenatal care services utilization in Nairobi County using logistic regression model. *Am J Theor Appl Stat*, 4(5), 322-8.
- Baugh, N., Harris, D. E., Aboueissa, A. M., Sarton, C., & Lichter, E. (2016). The impact of maternal obesity and excessive gestational weight gain on maternal and infant outcomes in Maine: analysis of pregnancy risk assessment monitoring system results from 2000 to 2010. *Journal of pregnancy*, 2016.

- Berg CJ., Callaghan WM., Swerson C., (2010): Pregnancy-related mortality in the United States, 1998 to 2006. *Obstet Gynecol* 116(6):1302
- Berg CJ., Harper M., Atkinson SM (2005): Preventability of pregnancy-related deaths. *Obstet Gynecol* (106:1228)
- Bhat, A., & Kharde, S. (2019). Hypertensive Disorders of Pregnancy and Associated Factors. *International Journal of Health Sciences and Research*, 9(1), 128-131.
- Bollampally, M., Chandershekhar, P., Kumar, K., Surakasula, A., Srikanth, S., & Reddy, T. (2016). Assessment of patient's knowledge, attitude and practice regarding hypertension. *Int J Res Med Sci*, 4(6), 3299-304.
- Butalia, S., Audibert, F., Côté, A. M., Firoz, T., Logan, A. G., Magee, L. A., ... & Nerenberg, K. A. (2018). Hypertension Canada's 2018 guidelines for the management of hypertension in pregnancy. *Canadian Journal of Cardiology*, 34(5), 526-531.
- Campbell D., MacGillivray I., Carr-Hill R., (2014): Pre-eclampsia in second pregnancy. *Br J Obstet Gynaecol* (92:131).
- Cavkaytar, S., Seval, M. M., Atak, Z., Findik, R. B., Ture, S., & Kokanali, D. (2015). Effect of reproductive history, lactation, first pregnancy age and dietary habits on bone mineral density in natural postmenopausal women. *Aging clinical and experimental research*, 27(5), 689-694.
- Chanda, M. M., Ortblad, K. F., Mwale, M., Chongo, S., Kanchele, C., Kamungoma, N., ... & Oldenburg, C. E. (2017). Contraceptive use and unplanned pregnancy among female sex workers in Zambia. *Contraception*, 96(3), 196-202.
- Chasan-Taber, Lisa, Marushka Silveira, Penelope Pekow, Barry Braun, JoAnn E. Manson, Caren G. Solomon, and Glenn Markenson. "Physical activity, sedentary behavior and risk of hypertensive disorders of pregnancy in Hispanic women." *Hypertension in pregnancy* 34, no. 1 (2015): 1-16.
- Cheng, T. S., Loy, S. L., Cheung, Y. B., Godfrey, K. M., Gluckman, P. D., Kwek, K., ... & Chan, J. K. Y. (2016). Demographic characteristics, health behaviors before and during pregnancy, and pregnancy and birth outcomes in mothers with different pregnancy planning status. *Prevention Science*, 17(8), 960-969.
- Cunningham F. Gary., Kenneth J. Leveno., Steven L. Bloom., (2014). *Williams Obstetrics*, 24th Edition. USA, Chapter 42 (p. 1148)
- Davids, J. S., Scully, R. E., & Melnitchouk, N. (2017). Impact of procedural training on pregnancy outcomes and career satisfaction in female postgraduate medical trainees in the United States. *Journal of the American College of Surgeons*, 225(3), 411-418.
- Dawson LM., Parfrey PS., Hefferton D., (2013): Familial risk of preeclampsia in Newfoundland: A population-based study. *J Am Soc Nephrol* (13:1901).
- Deborah M., Augustinus A., Fred YB., Anthony E., Lyonne M., Sam Newton & Charles Agyemang. (2013) Rural and urban differences in blood pressure and pregnancy-induced

hypertension among pregnant women in Ghana, *Globalization and Health*

- Dekker GA., Sibai BM., (2016). Etiology and pathogenesis of preeclampsia: current concepts. *Am J ObstetGynecol* (179:1359)
- Deputy, N. P., Sharma, A. J., Kim, S. Y., & Hinkle, S. N. (2015). Prevalence and characteristics associated with gestational weight gain adequacy. *Obstetrics and gynecology*, 125(4), 773.
- Dietl, Anna, and Juliane Farthmann. 2015. "Gestational Hypertension and Advanced Maternal Age." *The Lancet*.
- Duckitt K., Harrington D., (2005). Risk factors for pre-eclampsia at antenatal booking: Systematic review of controlled studies. *BMJ* 2005 (330:565).
- Egharevba, J., Pharr, J., van Wyk, B., & Ezeanolue, E. (2017). Factors influencing the choice of child delivery location among women attending antenatal care services and immunization clinic in Southeastern Nigeria. *International Journal of MCH and AIDS*, 6(1), 82.
- Jabuya Eucabeth Agola. *Treatment compliance among women with pregnancy induced hypertension attending selected health facilities in Rachuonyo North Sub-County, Homabay County, Kenya*. Diss. Kenyatta University, 2016.
- Eze, E. D., Barasa, A., Adams, M. D., Rabi, K. M., Ezekiel, I., Sulaiman, S. O., & Ponsiano, N. (2018). Determination, knowledge and prevalence of pregnancy-induced hypertension/eclampsia among women of childbearing age at same district Hospital in Tanzania. *Int J Med Med Sci*, 10(2), 19-26.
- Fadare, R. I., Akpor, O. A., & Oziegbe, O. B. (2016). Knowledge and attitude of pregnant women towards management of pregnancy-induced hypertension in Southwest Nigeria. *Journal of Advances in Medical and Pharmaceutical Sciences*, 1-10.
- Farland, L. V., Grodstein, F., Srouji, S. S., Forman, J. P., Rich-Edwards, J., Chavarro, J. E., & Missmer, S. A. (2015). Infertility, fertility treatment, and risk of hypertension. *Fertility and sterility*, 104(2), 391-397.
- Gandhi K., & Rao V., (2014). Socio-demographic and other risk factors of pre-eclampsia at a Tertiary care hospital, karnataka: case control study. *Journal of clinical and diagnostic research: JCDR*, 8(9), JC01–JC4. doi:10.7860/JCDR/2014/10255.4802
- Ganjali, M., Sepehri, Z., Amjadi, N., Bagheri, S., & Davoodi, M. (2017). Knowledge, attitude and functioning toward pregnancy induced hypertension in pregnant women referred to health centers in Zabol, 2014. *Indian Journal of Forensic Medicine & Toxicology*, 11(2), 241-245.
- Garomssa H., Dwivedi A., (2008). Maternal mortality in Ambo Hospital: a five year Retrospective review. *Ethiopian J Reprod Health*. (2:2–13)
- Gaugler I., Berends A., de Groot C., Steegers E., (2008) severe very early onset of Preeclampsia: subsequent pregnancies and future parental cardiovascular health. *Eur J ObstetGynecolReprodBiol* (140:171)
- Gaym A., Bailey P., BLuwei P., Admasu K., Gebrehiwot Y., (2011): Disease burden due to Pre-

- Eclampsia/eclampsia and the Ethiopian health system's response. *Int J Gynecol Obstet* (115:112–6).
- George, M., George, N., & Ramesh, N. (2016). Awareness regarding anemia, gestational diabetes and pregnancy induced hypertension among antenatal women attending outpatient department in a rural hospital. *Hindu*, 142, 94-7.
- Gizachew A., Abebe T., Tadesse A., (2015): Preeclampsia and associated factors among Pregnant women attending antenatal care in Dessie referral hospital. *BMC Pregnancy and Childbirth* (15:73).
- Govender, T., Reddy, P., & Ghuman, S. (2018). Obstetric outcomes and antenatal access among adolescent pregnancies in KwaZulu-Natal, South Africa. *South African Family Practice*, 60(1).
- Greiner, K. S., Speranza, R. J., Rincón, M., Beeraka, S. S., & Burwick, R. M. (2020). Association between insurance type and pregnancy outcomes in women diagnosed with hypertensive disorders of pregnancy. *The Journal of Maternal-Fetal & Neonatal Medicine*, 33(8), 1427-1433.
- Gu Y., Warren J., Walker N., Kennelly J., (2013): Gender differences in cardiovascular disease risk management for Pacific Islanders in primary care. *Quality in primary care* (21).
- Gwamaka S., (2012): Utilization and factors affecting delivery in health facility among recent Delivered women in Nkasi District. Rukwa: Muhimbili University of Health and Allied Sciences
- Haffejee, F., O'Connor, L., Govender, N., Reddy, P., Sibiya, M. N., Ghuman, S., ... & Borg, D. (2018). Factors associated with unintended pregnancy among women attending a public health facility in KwaZulu-Natal, South Africa. *South African Family Practice*, 60(3), 1-5.
- Haji Mam, A. (2018). Does an antenatal educational programme decrease adverse pregnancy outcomes among obese pregnant women? A feasibility study in Kurdistan Region of Iraq.
- Hercus, A., Dekker, G., & Leemaqz, S. (2020). Primipaternity and birth interval; independent risk factors for preeclampsia. *The journal of maternal-fetal & neonatal medicine*, 33(2), 303-306.
- Hu, R., Li, Y. X., Di, H. H., Li, Z. W., Zhang, C. H., Shen, X. P., ... & Yan, W. R. (2015). Risk factors of hypertensive disorders among Chinese pregnant women. *Journal of Huazhong University of Science and Technology [Medical Sciences]*, 35(6), 801-807.
- Imoro, W. D. S. (2018). *Awareness and health seeking behaviour of pregnant women about pregnancy induced hypertension in the Tamale Metropolis* (Doctoral dissertation).
- Kaphagawani, N. C., & Kalipeni, E. (2017). Sociocultural factors contributing to teenage pregnancy in Zomba district, Malawi. *Global public health*, 12(6), 694-710.
- Kasim, R., Draman, N., Kadir, A. A., & Muhamad, R. (2016). Knowledge, attitudes and practice of preconception care among women attending maternal health clinic in Kelantan. *Education in Medicine Journal*, 8(4).

- Khan KS., Wojdyla D., Say L., (2006): WHO analysis of causes of maternal death: a Systematic review. *Lancet* (367:1066).
- Khosravi, S., Dabiran, S., Lotfi, M. and Asnavandy M., (2014): Study of the Prevalence of Hypertension and Complications of Hypertensive Disorders in Pregnancy. *Open Journal of Preventive Medicine* (860:867).
- Kigenyi O., Tefera G., Nabiwemba E/, Orach C., (2013) Quality of intrapartum care at Mulago National referral hospital, Uganda: clients' perspective. *BMC Pregnancy Childbirth*. (1:162).
- Koo, B. K., Lee, J. H., Kim, J., Jang, E. J., & Lee, C. H. (2016). Prevalence of gestational diabetes mellitus in Korea: a national health insurance database study. *PLoS One*, 11(4).
- Lee, K. W., Ching, S. M., Ramachandran, V., Yee, A., Hoo, F. K., Chia, Y. C., ... & Veettil, S. K. (2018). Prevalence and risk factors of gestational diabetes mellitus in Asia: a systematic review and meta-analysis. *BMC pregnancy and childbirth*, 18(1), 494.
- Leng, J., Shao, P., Zhang, C., Tian, H., Zhang, F., Zhang, S., ... & Hu, G. (2015). Prevalence of gestational diabetes mellitus and its risk factors in Chinese pregnant women: a prospective population-based study in Tianjin, China. *PloS one*, 10(3).
- Li, X., Tan, H., Huang, X., Zhou, S., Hu, S., Wang, X., ... & Wen, S. W. (2016). Similarities and differences between the risk factors for gestational hypertension and preeclampsia: A population based cohort study in south China. *Pregnancy Hypertension: An International Journal of Women's Cardiovascular Health*, 6(1), 66-71.
- Lim, C. C., & Mahmood, T. (2015). Obesity in pregnancy. *Best Practice & Research Clinical Obstetrics & Gynaecology*, 29(3), 309-319.
- Luke, B. (2017). Pregnancy and birth outcomes in couples with infertility with and without assisted reproductive technology: with an emphasis on US population-based studies. *American journal of obstetrics and gynecology*, 217(3), 270-281.
- Maputle, S., Khoza, L., & Lebeso, R. (2015). Knowledge towards pregnancy-induced hypertension among pregnant women in Vhembe District, Limpopo Province. *Journal of Human Ecology*, 51(1-2), 47-54.
- Masho, S. W., Morris, M. R., & Wallenborn, J. T. (2016). Role of marital status in the association between prepregnancy body mass index and breastfeeding duration. *Women's Health Issues*, 26(4), 468-475.
- Matejić B., Milićević M., Vasić V., Djikanović B., (2014) maternal satisfaction with organized Perinatal care in Serbian public hospitals. *BMC Pregnancy Childbirth* (1:14).
- Mbouemboue, O. P., Cellou, D., Tamanji, M. T., Blakga, C., Kamdje, A. H. N., Ngoufack, J. O., & Youmbi, A. (2016). A Study on Factors Related to Hypertensive Disorders in Pregnancy in Ngaoundere (Adamawa Region, Cameroon). *Clinical Medicine Research*, 5(2), 6-12.
- Mehta, B., Kumar, V., Chawla, S., Sachdeva, S., & Mahopatra, D. (2015). Hypertension in pregnancy: a community-based study. *Indian journal of community medicine: official*

- publication of Indian Association of Preventive & Social Medicine, 40(4), 273.*
- Misganaw A., (2012): Ethiopian Ministry of Health: Health and Health Related Indicators: Validity of Verbal Autopsy Method to determine causes of death among adults in the urban setting of Ethiopia. *BMC Med Res Methodology* (12:130).
- Mpofu, J. J., de Moura, L., Farr, S. L., Malta, D. C., Iser, B. M., Bernal, R. T. I., ... & Lobelo, F. (2016). Associations between noncommunicable disease risk factors, race, education, and health insurance status among women of reproductive age in Brazil—2011. *Preventive medicine reports*, 3, 333-337.
- Muti, M., Tshimanga, M., Notion, G. T., Bangure, D., & Chonzi, P. (2015). Prevalence of pregnancy induced hypertension and pregnancy outcomes among women seeking maternity services in Harare, Zimbabwe. *BMC cardiovascular disorders*, 15(1), 111.
- Nilsson E, SalonenRos H, Cnattingius S, Lichtenstein P (2015): The importance of genetic and Environmental effects for pre-eclampsia and gestational hypertension: *a family study*. *BJOG*; (111:200).
- Nimi, T., Fraga, S., Costa, D., Campos, P., & Barros, H. (2016). Prenatal care and pregnancy outcomes: a cross-sectional study in Luanda, Angola. *International Journal of Gynecology & Obstetrics*, 135, S72-S78.
- Oso Y., Onen, D., (2009) A General Guide to Writing a Research Proposal and Report. Nairobi: *Jomo Kenyatta Foundation*.
- Osungbade K., Ige O., (2011): Public health perspectives of preeclampsia in developing Countries: implication for health system strengthening *J Pregnancy* (2011:1095).
- Otieno O., (2014): Factors influencing implementation of Free Maternal Services in Kenya. A Case of Public Hospitals in Nairobi County. *Nairobi University of Nairobi Printing Press*.
- Otieno W., (2013). "Kenya's Other Great Catastrophe: Women and Infants Dying in Childbirth," *The Guardian*.
- Patel, B. B., Gurmeet, P., Sinalkar, D. R., Pandya, K. H., Mahen, A., & Singh, N. (2016). A study on knowledge and practices of antenatal care among pregnant women attending antenatal clinic at a Tertiary Care Hospital of Pune, Maharashtra. *Medical Journal of Dr. DY Patil University*, 9(3), 354.
- Phad, N., Dahlstrom, J. E., Ellwood, D., & Kent, A. L. (2015). The effect of pregnancy-induced hypertensive disorders on placental growth along short and long axes and neonatal outcomes. *Australian and New Zealand Journal of Obstetrics and Gynaecology*, 55(3), 239-244.
- Piveta, V., Campaner Ferrari Bernardy, C., & Malagutti Sodré, T. (2016). Perception of pregnancy risk by a group of pregnant women hypertensive hospitalized. *Ciência, Cuidado e Saúde*, 15(1).
- Rocheleau, C. M., Bertke, S. J., Lawson, C. C., Romitti, P. A., Desrosiers, T. A., Agopian, A. J., ... & National Birth Defects Prevention Study. (2017). Factors associated with employment

- status before and during pregnancy: Implications for studies of pregnancy outcomes. *American journal of industrial medicine*, 60(4), 329-341.
- Sachdeva P., Patel B., (2011) Bhatt M., A study of incidence and management of pregnancy Induced hypertension in Central Gujarat, India. *International Journal of Universal Pharmacy and Life Sciences* (61:70).
- Saftlas A., Olson D., Franks A., (2014): Epidemiology of preeclampsia and eclampsia in the United States, 1979-1986. *J ObstetGynecol* (163:460).
- Saucedo M., Deneux C., Bouvier C., (2013): Ten years of confidential inquiries into maternal Deaths in France, 1998–2007. *ObstetGynecol* (4:752).
- Sekaran, U., Bougie R., John W., Son I., (2013): Research methods for business: *skill building Approach 4th ed.*, p. (436).
- Shikha S., Chandra S., Thimmaraju K., Mallick A., Kanchan D., Biswajit D., (2014): Socio-Demographic Profile of Pregnancy Induced Hypertension in a Tertiary Care Centre, Sch. *App. Med. Sci* (3081:3086)
- Sibai B., Mercer B., Sarinoglu C., (2014): Severe preeclampsia in the second trimester: Recurrence risk and long-term prognosis. *Am J ObstetGynecol* (165:1408).
- Sibai B., Nazer A., Gonzalez A., (2014): Severe preeclampsia-eclampsia in young prim gravid Women: subsequent pregnancy outcome and remote prognosis. *Am J ObstetGynecol* (155:1011).
- Singh, V., & Srivastava, M. (2015). Associated risk factors with pregnancy-induced hypertension: A hospital-based KAP study. *International Journal of Medicine and Public Health*, 5(1).
- Spracklen, C. N., Ryckman, K. K., Triche, E. W., & Saftlas, A. F. (2016). Physical activity during pregnancy and subsequent risk of preeclampsia and gestational hypertension: a case control study. *Maternal and child health journal*, 20(6), 1193-1202.
- Stegers E., Dadelszen P., Duvekot J., Pijnenborg R., (2010): Preeclampsia. *Lancet*. (376:631–41).
- Stüber, T. N., Künzel, E. C., Zollner, U., Rehn, M., Wöckel, A., & Höinig, A. (2015). Prevalence and associated risk factors for obesity during pregnancy over time. *Geburtshilfe und Frauenheilkunde*, 75(09), 923-928.
- Tessema, G. A., Tekeste, A., & Ayele, T. A. (2015). Preeclampsia and associated factors among pregnant women attending antenatal care in Dessie referral hospital, Northeast Ethiopia: a hospital-based study. *BMC pregnancy and childbirth*, 15(1), 73.
- Umesawa, M., & Kobashi, G. (2017). Epidemiology of hypertensive disorders in pregnancy: prevalence, risk factors, predictors and prognosis. *Hypertension Research*, 40(3), 213-220.
- Van Der Hoeven, T., Browne, J. L., Uiterwaal, C. S., Van Der Ent, C. K., Grobbee, D. E., & Dalmeijer, G. W. (2017). Antenatal coffee and tea consumption and the effect on birth outcome and hypertensive pregnancy disorders. *PloS one*, 12(5).

- Van Rijn B., Hoeks L., Bots M., (2006): Outcomes of subsequent pregnancy after first pregnancy with early-onset preeclampsia. *Am J ObstetGynecol* (195:723).
- Wolde Z., Segni H., Woldie M., (2011): hypertensive disorders of pregnancy in Jimma University specialized hospital. *Ethiopia J Health Sci.* (21(3):147).
- World Health Organization. (2016). *WHO recommendations on antenatal care for a positive pregnancy experience*. World Health Organization.
- Xiong X., Fraser WD., Demianczuk N., (2012) History of abortion, preterm, term birth, and risk of preeclampsia: a population-based study. *Am J ObstetGynecol* (187:1013).
- Yeoh, P. L., Hornetz, K., & Dahlui, M. (2016). Antenatal care utilisation and content between low-risk and high-risk pregnant women. *PLoS One*, 11(3).
- Yuce, T., Keskin, M., Seval, M. M., & Söylemez, F. (2015). Effect of the timing of delivery on perinatal outcomes at gestational hypertension. *Interventional Medicine and Applied Science*, 7(2), 59-62.
- Yuniarini, Y. (2017, September). Adolescent Pregnancy Worldwide: A Narrative Review. In *Proceedings of the International Conference on Applied Science and Health* (No. 2, pp. 34-38).
- Zhang, S., Wang, L., Leng, J., Liu, H., Li, W., Zhang, T., ... & Hu, G. (2017). Hypertensive disorders of pregnancy in women with gestational diabetes mellitus on overweight status of their children. *Journal of human hypertension*, 31(11), 731-736.
- Zhuang, C., Gao, J., Liu, J., Wang, X., He, J., Sun, J., ... & Liao, S. (2019). Risk factors and potential protective factors of pregnancy-induced hypertension in China: A cross-sectional study. *The Journal of Clinical Hypertension*, 21(5), 618-623.