



Risk factors Contributed to gestational Hypertension among Women at Primary Health Care Centers in Al-Najaf City

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Abstract:

Introduction: Hypertensive disorders of pregnancy (HDP) are among the main public health problems. Worldwide are the most common complication during pregnancy and that increase contributes to maternal and perinatal morbidity and mortality.

Methodology: A descriptive case control study was applied on women who have gestational hypertension at primary health care centers in AL-Najaf City, through period from 8th October 2017 to 17th September 2018, in order to assess risk factors contributed to gestational hypertension , as well as to determine the prevalence of risk factors by age ,level of education, occupation and body weight. A cluster sampling method including as (100) women with gestational hypertension study group and (100) women without gestational hypertension control group. A questionnaire composed of five parts was used, including demographic information, medical history, reproductive history, lifestyle and psychological stress.

Results: The results showed the significant relationship between gestational hypertension and women over age 35>, obesity, family history of hypertension and psychological stress.

Conclusions: The study concluded that Risk factors included in the study that found relationship to gestational hypertension, with evidence that women in the control group were not affected by the risk factors.

Recommendation: Early detection and management of mothers with gestational hypertension should be mandatory as part of focused antenatal care and follow up, Health education of the hypertension pregnant women regarding the risk factor which effect on their blood pressure by medical and nursing staff.

Key Words: Gestational hypertension, Risk factors.

1. INTRODUCTION:

Hypertensive disorders of pregnancies(HDP) remain a central public health concern throughout the world⁽¹⁾. HDP are an important cause of severe morbidity, long- term disability and death among both mothers and their babies^(2,3). Worldwide, HDP may complicate 5–10% of all pregnancies regarding to population and the diagnostic criteria, are responsible for 12–25% cases of maternal death during pregnancy and the puerperium⁽⁴⁾. Approximately 30% of HDP are caused by chronic hypertension and 70% of cases are diagnosed as GH and/or preeclampsia⁽⁵⁾. GH is the most common hypertensive disorder induced by pregnancy. The onset of hypertension is defined by: systolic BP \geq 140 mmHg and/or diastolic BP \geq 90 mmHg at \geq twenty weeks of gestation in without the presence of protein in the urine or other sign of preeclampsia^(6,7,8). The BP readings should be documented on at least two occasions at least four hours apart. GH is severe when systolic BP is \geq 160 mmHg and/or diastolic BP is \geq 110 mmHg on two consecutive BP measurements at least four hours apart⁽⁹⁾. World Health Organization (WHO) estimates that at least one woman dies every seven minutes from complications of HDP⁽¹⁰⁾. HDP and complications during pregnancy are among the most important causes contributing to maternal mortality in Middle East⁽¹¹⁾. In Iraq, HDP third direct cause of maternal mortality were (15.3%, 11.0%) during 2010 and 2012 respectively⁽¹²⁾. Though HDP cannot be prevented, its development to severe can be prevented and development of complication can be prevented by early detection and quality antenatal care. The early recognition of elevated BP in pregnancy and recognition of warning signs are of utmost importance in preventing the maternal and perinatal mortality and morbidity associated with HDP⁽¹³⁾. The

knowledge of the most essential risk factors that exist in the population can be useful to recognize the women who have greater probabilities to develop the hypertensive disorders in women and consequently, acceptable prenatal care might contribute to reduction this maternal mortality ratio⁽¹⁴⁾.

Objectives of the study:

1-To assess the major risk factors that contributed to gestational Hypertension among women at primary health care centers in Al-Najaf city.

2-To determine the prevalence of risk factors by age ,level of education, occupation and body weight.

2. MATERIALS AND METHODS:

A descriptive design case- control study was carried out, so as to attain the stated objectives, during the period from October 8th 2017 to September 17th 2018.

Study setting:

This study was carried out in primary health care centers from in AL-Najaf City.

Sample of the study:

A probability sampling technique (Cluster sample) was among pregnant women The Sampling consist of study group (100) pregnant women with gestational hypertension selected in the current study by using a non- random sample (purposive) based on some criteria and control group (100) healthy pregnant women.

Statistical analysis:

The data of the present study were analyzed through the use of statistical package of social sciences (SPSS) version 19.the data were analyze through application of the descriptive and inferential data analysis methods, included: Frequencies and Percentage, Mean of scores, Chi-square.

3. STUDY RESULT AND FINDINGS:

Table (1) Distribution of Study and control group according to the Demographic Data

Demographic Data	Rating And Intervals	Groups		Total
		Study	Control	
Age / Years	15-19	14	32	46
	20 – 24	24	32	56
	25 – 29	16	22	38
	30 – 34	20	8	28
	35+	26	6	32
Total		100	100	200
Residency	Urban	98	97	195
	Rural	2	3	5
Total		100	100	200
Education Level	Illiterate	16	12	28
	Able to read and write	27	23	50
	Primary school	32	33	65
	Intermediate school	15	11	26
	Secondary school	3	12	15
	College / institute	7	9	16
Total		100	100	200
Occupation	Governmental employee	3	4	7
	Private worker	1	0	1
	Housewife	92	90	182
	Student	4	6	10
Total		100	100	200
Socioeconomic	Satisfied	12	25	37
	Satisfied to some extent	42	46	88
	Unsatisfied	46	29	75
Total		100	100	200
BMI	Underweight	0	1	1
	Normal Weight	7	21	28
	Overweight	19	38	57
	Obesity	74	40	114
Total		100	100	200

Table (2) Distribution of Study and control group according to the Lifestyle

Lifestyle	Rating And Intervals	Groups		Total
		Study	Control	
Smoking	Yes	2	1	3
	No	98	99	197
Total		100	100	200
Exposed Smoker	Yes	75	67	142
	No	25	33	58
Total		100	100	200
Exercise	Yes	27	36	63
	No	73	64	137
Total		100	100	200
Regular Exercise	Yes	10	9	19
	No	90	91	181
Total		100	100	200
Control of diet	Yes	45	28	73
	No	55	72	127
Total		100	100	200
Low Cholesterol	Yes	44	23	67
	No	56	77	133
Total		100	100	200
Low Salt	Yes	44	26	70
	No	56	74	130
Total		100	100	200
Low Sugar	Yes	24	19	43
	No	76	81	157
Total		100	100	200
Take Vitamins & Dietary Supplement	Yes	78	80	158
	No	22	20	42
Total		100	100	200
Use of Medication	Yes	0	5	5
	No	100	95	195
Total		100	100	200

Table (3) Assessment level of stress in Study and control group for Psychological Stress

Assessment of psychological stress	Groups		Total
	Study	Control	
High Stress	49	25	74
Moderate Stress	38	42	80
Low Stress	13	33	46
Total	100	100	200

Low (mean of scores 2.34 and more), moderate (mean of scores 1.67-2.33), high (mean of scores 1-1.66).

Table (4) Relationship Between the prevalence of Gestational Hypertension and the Study Sample Demographic Data

Demographic Data	Rating And Intervals	Groups		Total	Sig.
		Study	Control		
Age / Years	15-19	14	32	46	X2 (26.77) D.F. (4) P-Value (0.001) HS
		30.4%	69.6%	100.0%	
	20 - 24	24	32	56	
		42.9%	57.1%	100.0%	
	25 - 29	16	22	38	
		42.1%	57.9%	100.0%	
	30 - 34	20	8	28	
		71.4%	28.6%	100.0%	
	35+	26	6	32	
		81.3%	18.8%	100.0%	
Total		Freq.	100	200	
		%	50.0%	100.0%	
Residency	Urban	98	97	195	X2 (0.205) D.F. (1) P-Value (0.65) NS
		50.3%	49.7%	100.0%	
	Rural	2	3	5	
		25.0%	75.0%	100.0%	
Total		Freq.	100	200	
		%	50.0%	100.0%	
Education Level	Illiterate	16	12	28	X2 (7.17) D.F. (5) P-Value (0.208) NS
		57.1%	42.9%	100.0%	
	Able To Read And Write	27	23	50	
		54.0%	46.0%	100.0%	
	Primary School	32	33	65	
		49.2%	50.8%	100.0%	
	Intermediate School	15	11	26	
		57.7%	42.3%	100.0%	
	Secondary School	3	12	15	
		20.0%	80.0%	100.0%	
College / Institute	7	9	16		
	43.8%	56.3%	100.0%		
Total		Freq.	100	200	
		%	50.0%	100.0%	
Occupation	Governmental Employee	3	4	7	X2 (1.565) D.F. (3) P-Value (0.667) NS
		42.9%	57.1%	100.0%	
	Private Worker	1	0	1	
		100.0%	.0%	100.0%	
	Housewife	92	90	182	
		50.5%	49.5%	100.0%	
Students	4	6	10		
	40.0%	60.0%	100.0%		
Total		Freq.	100	200	
		%	50.0%	100.0%	
Socioeconomic	Satisfied	12	25	37	X2 (8.60) D.F. (2) P-Value (0.014) S
		32.4%	67.6%	100.0%	
	Satisfied To Some Extent	42	46	88	
		47.7%	52.3%	100.0%	
	Unsatisfied	46	29	75	
61.3%		38.7%	100.0%		
Total		Freq.	100	200	
		%	50.0%	100.0%	
BMI	Underweight	0	1	1	X2 (24.47) D.F. (3) P-Value (0.001) HS
		.0%	100.0%	100.0%	
	Normal Weight	7	21	28	
		25.0%	75.0%	100.0%	
	Overweight	19	38	57	
		33.3%	66.7%	100.0%	
Obesity	74	40	114		
	64.9%	35.1%	100.0%		
Total		Freq.	100	200	
		%	50.0%	100.0%	

Table (4) indicates that there are high significant relationships between prevalence of Gestational Hypertension and the age , body mass index while there are significant relationships between and the socioeconomic status . Also the table clarifies that there are non-significant relationships between prevalence of Gestational Hypertension and each of (residency, level of education, occupation).

Table (5) Relationship Between the prevalence of Gestational Hypertension and the Study Sample lifestyle

Demographic Data	Rating And Intervals	Groups		Total	Sig.
		Study	Control		
Smoking	Yes	2	1	3	X2 (0.33) D.F. (1) P-Value (0.561) NS
		66.7%	33.3%	100.0%	
	No	98	99	197	
		49.7%	50.3%	100.0%	
Total		Freq.	100	200	
		%	50.0%	100.0%	
Exposed Smoker	Yes	75	67	142	X2 (1.55) D.F. (1) P-Value (0.213) NS
		52.8%	47.2%	100.0%	
	No	25	33	58	
		43.1%	56.9%	100.0%	
Total		Freq.	100	200	
		%	50.0%	100.0%	
Exercise	Yes	27	36	63	X2 (1.87) D.F. (1) P-Value (0.171) NS
		42.9%	57.1%	100.0%	
	No	73	64	137	
		53.3%	46.7%	100.0%	
Total		Freq.	100	200	
		%	50.0%	100.0%	
Regular Exercise	Yes	10	9	19	X2 (0.05) D.F. (1) P-Value (0.809) NS
		52.6%	47.4%	100.0%	
	No	90	91	181	
		49.7%	50.3%	100.0%	
Total		Freq.	100	200	
		%	50.0%	100.0%	
Control of diet	Yes	45	28	73	X2 (6.23) D.F. (1) P-Value (0.013) S
		61.6%	38.4%	100.0%	
	No	55	72	127	
		43.3%	56.7%	100.0%	
Total		Freq.	100	200	
		%	50.0%	100.0%	
Low Cholesterol	Yes	44	23	67	X2 (9.89) D.F. (1) P-Value (0.002) HS
		65.7%	34.3%	100.0%	
	No	56	77	133	
		42.1%	57.9%	100.0%	
Total		Freq.	100	200	
		%	50.0%	100.0%	
Low Salt	Yes	44	26	70	X2 (7.12) D.F. (1) P-Value (0.008) HS
		62.9%	37.1%	100.0%	
	No	56	74	130	
		43.1%	56.9%	100.0%	
Total		Freq.	100	200	
		%	50.0%	100.0%	
Low Sugar	Yes	24	19	43	X2 (0.74) D.F. (1) P-Value (0.389) NS
		55.8%	44.2%	100.0%	
	No	76	81	157	
		48.4%	51.6%	100.0%	
Total		Freq.	100	200	
		%	50.0%	100.0%	
Take Vitamins & Dietary Supplement	Yes	78	80	158	X2 (0.12) D.F. (1) P-Value (0.728) NS
		49.4%	50.6%	100.0%	
	No	22	20	42	
		52.4%	47.6%	100.0%	
Total		Freq.	100	200	
		%	50.0%	100.0%	
Use Medication	Yes	0	5	5	X2 (5.12) D.F. (1) P-Value (0.024) S
		.0%	100.0%	100.0%	
	No	100	95	195	
		51.3%	48.7%	100.0%	
Total		Freq.	100	200	
		%	50.0%	100.0%	

Table (5) shows that there is a high significance between the prevalence of gestational hypertension and their (low cholesterol and low salt) and significance in relation with (control of diet and use medication). While there is a non-significant with (smoking, exposed smoker, exercise, regular exercise, low sugar, take vitamin and dietary supplement).

Table (6) Relationship Between the prevalence of Gestational Hypertension and the Study Sample exhibition of stress

Overall Assessment of Stress	Groups		Total	Sig.
	study	Control		
High Stress	49	25	74	X2 (16.67) D.F. (2) P-Value (0.001) HS
	66.2%	33.8%	100.0%	
Moderate Stress	38	42	80	
	47.5%	52.5%	100.0%	
Low Stress	13	33	46	
	28.3%	71.7%	100.0%	
Total	Freq.	100	200	
	%	50.0%	100.0%	

Table (6) this table show high significance relationship between prevalence of gestational hypertension and psychological stress.

4. DISCUSSION:

Discussion of the Study Sample Demographic Data:

In this study, most of the pregnant in study groups belong to the age 35 years or above age group compared with control group. As for the residency, the present study shows that the majority of study group and control group living in urban residential areas were (98%). Also, the result of the present study about educational level and of participants revealed that most of participants of study and control group were (32%,33%) respectively primary school graduated. This study results also show majority of participant were housewives found to affect the occurrence of hypertension during pregnancy compared to being workers. Most pregnant women with hypertension were housewives (92%) while the percentage from workers was 4% and lowest percentage was 4% from students. Such result can be interpreted by that the females are having desire to stay in house to rearing their children and other household such as cleaning the house and cooking. According to the obesity concerned in the present the study, most of study group were obesity (74%). This result can be interpreted by most of the pregnant women who lack physical activity, This may be role of obesity.

Discussion of the Study Sample lifestyle history:

Concerning smoking, in this study majority of participant both groups are non-smokers (98%,99%) respectively. Such result can be interpreted by the cultural and social factors making a number of barriers that prevent the female from experiencing smoking as compared with males in our society furthermore the awareness about the health problems associated with the smoking which may play an important role in decreasing the females, interest in smoking. Also the study results showed the most of the participants of study and control group (73%,64%) respectively have no exercise. This result agreement with Owiredu *et al* 2012 in chana He found the most participants have no exercise⁽¹⁵⁾. According to the control of diet, The study result shows that the most participants of the study and control group no control of diet including low cholesterol this finding is in agreement with Jones *et al.*, 2017 who found that the most of the participants women did not take low cholesterol diet⁽¹⁶⁾. Regarding the use medication majority of the women study and control did

not use medication This is in agreement with Poon *et al* 2010 in the United Kingdom (UK) he found the majority of participant did use any medication⁽¹⁷⁾.

Discussion of the study psychological stress:

Also the study results showed that most of the participants of the study group have high psychological stress (49%) compared with control group were (42%) moderate psychological stress. This result may come because of stress home environment and stress work environment that play role of psychological stress. This result can be interpreted by stress contributing in increase of hormones (adrenaline and cortisol) which contribute to the elevation of blood pressure, as a result of rapid heart rate and contraction of the arteries.

Discussion Relationship Between the prevalence of Gestational Hypertension and the Study Sample Demographic Data:

The present study shows that there is a significant relationship between the prevalence of GH and the participants age, socioeconomic statues, and BMI. While there is a non-significant relationship with other demographic data.

About age, this result indicates the direct relationship between age group and prevalence of GH, this results can be interpreted by the hormonal change and appear chronic disease and lack of exercise in the age group. This study result is similar to the study that is conducted by Al-Jumaily *et al* in 2017 in Iraq concluded that there was relationship between GH and age⁽¹⁸⁾. This result is in disagreement with Mbouemboue *et al* 2016 in Cameroon he found no relationship between GH and age group⁽¹⁹⁾.

About SES, the study results show that there is a significant relationship between the SES and prevalence of GH this results may come because low SES which GH was highly among them and having poor access to antenatal care (ANC). Current finding is in agreement with a study done by Hussian and Saffar, 2015 in Iraq. He showed significant relationship between prevalence of GH and SES⁽²⁰⁾. This result is in disagreement with Kindo *et al* 2012 who showed no relationship between prevalence of GH and SES⁽²¹⁾.

Concerning maternal obesity the study indicates significant relationship between prevalence of GH and obesity This study can be interpreted to Obesity which is associated with insulin resistance, dyslipidemia, chronic inflammation and oxidative stress, all of which have been demonstrated in women presenting with GH. This result supported with Assis *et al* 2008 in Brazil who show significant relationship between prevalence of GH and obesity ⁽²²⁾.

Discussion Relationship Between the Prevalence of Gestational Hypertension and the Study Sample Lifestyle:

About study sample lifestyle the results show that there is a significant relationship between the prevalence of GH and the control of diet including low cholesterol, low salt and use medication. However, there is a non-significant with other variables. Concerning low cholesterol, this table shows a significant Relationship between the prevalence of GH and take diet low cholesterol. This result agrees with Jones *et al* 2017 who showed significant relationship between taking low diet cholesterol and prevalence of GH ⁽¹⁶⁾. Also the study results show that there is a significant relationship between the prevalence of GH and the diet low salt This result agree with Ayele *et al* 2016 who show significant relationship between prevalence of GH and taking low diet salt ⁽²³⁾. The result shows significant relationship between prevalence of GH and use medication. This result is in disagreement with Renee and Fortner who found no significant relationship between prevalence of GH and use medication ⁽²⁴⁾.

Discussion Relationship Between the prevalence of Gestational Hypertension and the Study for Psychological Stress:

Concerning the study, being psychological stress high significant relationship between prevalence of GH and psychological stress. This result can be interpreted by stress contributing in increase of hormones (adrenaline and cortisol) which contribute to the elevation of blood pressure, as a result of rapid heart rate and contraction of the arteries. This result is in agreement with Naser 2016 in Egypt who found high significant relationship between prevalence of GH and psychological stress ⁽²⁵⁾.

5. CONCLUSIONS:

According to the result risk factors contributed of the gestational hypertension included: Age the women over age 35>years, socioeconomic unsatisfied, Maternal obesity, family history of hypertension and diabetes mellitus, control of diet (low cholesterol, low salt), use medication, psychological stress.

6. RECOMMENDATIONS:

1. Early detection and management of mothers with gestational hypertension should be mandatory as part of focused antenatal care and follow up.
2. Prevention must include campaigns and more emphasis on mother with such risk factors.
3. Health education of the hypertension pregnant women concerning the risk factor which effects their blood

pressure by medical and nursing staff, posters, newspaper.

4. Special emphasis should be given for mothers who have preexisting chronic medical disease, old age and prime gravid to have early recognition and readiness for better management of gestational hypertension.

REFERENCE:

1. Belinda, J., Shuchita, S., Tewabe, K., Acharya, A. (2010) 'Hypertension in pregnancy: A comprehensive update', *Cardiology in Review*, 18(4), pp. 178–189. doi: 10.1097/CRD.0b013e3181c60ca6.
2. WHO (2011) *who recommendations for prevention and Treatment of preeclampsia and eclampsia., who.* doi: NBK140561 [bookaccession].
3. Al-bahadily, A. J. M., Al-omrani, A. A. M. and Mohammed, M. (2017) 'The Effect of Pregnancy Induced Hypertension on Complete Blood Count of Newborn', *International Journal of Pediatrics*, 5(9), pp. 5667–5676. doi:10.22038/ijp.2017.24865.2101.
4. Agrawal, S. and Fledderjohann, J. (2016) 'Hypertensive disorders of pregnancy and risk of diabetes in Indian women: A cross-sectional study', *BMJ open*, 6(8), p. e011000.
5. Zibaeeezhad, M. J., Ghodsi, M., Arab, P. and Gholzom, N. (2010) 'The prevalence of hypertensive disorders of pregnancy in Shiraz, Southern Iran', *Iranian Cardiovascular Research Journal*, 4(4), pp. 169–172.
6. Wang, I. K., Tsai, I. J., Chen, P. C., Liang, C. C., Chou, C. Y., Chang, C. T., Kuo, H. L., Ting, I. W., Lin, C. C., Chuang, F. R., Huang, C. C. and Sung, F. C. (2012) 'Hypertensive disorders in pregnancy and subsequent diabetes mellitus: A retrospective cohort study', *The American Journal of Medicine*. Elsevier Inc., 125(3), pp. 251–257. doi: 10.1016/j.amjmed.2011.07.040.
7. Minimol.P.v, Sajeeth, C. I. and Thangamani, S. (2016) 'A Prospective Study on Prevalence, Risk Factors and Current Treatment Strategies for Pregnancy-Induced Hypertension in Various Hospitals-Palakkad', *Human Journals*, 6(3), pp. 87–102.
8. Prasad, C. K. and Pandey, J. C. (2016) 'Assessment of Lipoproteins in Pregnancy Induced Hypertension', *Asian Journal of Biomedical and Pharmaceutical Sciences*, 6(54), pp. 10–12. doi: 10.1097/gco.0b013e32835e0ef5.
9. Ahmed, S. S., Sultana, N., Begum, N., Lima, L. S., Abden, F. and Hosen, M.K. (2017) 'Pregnancy Induced Hypertension and Associated Factors among Pregnant Women', *Gynecology and Women's Health*, 3(4), pp. 2474–7602.
10. Nisar, N., Memon, A., Sohoo, N. A. and Ahmed, M. (2010) 'HYPERTENSIVE DISORDERS OF PREGNANCY: FREQUENCY, MATERNAL AND FETAL OUTCOMES', *PAKISTAN ARMED FORCES MEDICAL JOURNAL*, 60(1), pp. 8–113.
11. Suleiman, A. K. (2014) 'Risk Factors on Hypertensive Disorders among Jordanian Pregnant Women', *Global Journal of Health Science*, 6(2), pp. 1916–9736. doi: 10.5539/gjhs.v6n2p138.
12. MOH (2012) *Maternal Death Surveillance and Response (MDSR)Iraq.*
13. Salim, T. and Kuriakose, A. (2017) 'Knowledge of Gestational Hypertension and Its Self Care Measures among Primigravid Women', *Journal of medical Science And Clinical Research*, 05(01), pp. 15328–15335.
14. Dalmáz, C. A., Santos, K. G. D., Botton, M. R. and Roisenberg, I. (2011) 'Risk factors for hypertensive disorders of pregnancy in Southern Brazil', *Revista da Associação Médica Brasileira*, 57(6), pp. 692–696.
15. Owiredu, W. K. B. A., Ahenkorah, L., Turpin, C. A., Amidu, N. and Laing, E. F. (2012) 'Putative risk factors of pregnancy-induced hypertension among Ghanaian pregnant women', *Journal of Medical and Biomedical Sciences*, 1(3), pp. 62–76.
16. Jones, L., Takramah, W., Axame, W. K., Owusu, R., Parbey, P. A., Tarkang, E., Takase, M., Adjuik, M. and Adjuik, M. (2017) 'Risk Factors Associated with Pregnancy Induced Hypertension in the Hohoe Municipality of Ghana', *Journal of Preventive Medicine & Healthcare*, 1(3), p. 1011. doi: 10.9734/BJMMR/2016/29463.
17. Poon, L. C. Y., Kametas, N. A., Chelemen, T., Leal, A. and Nicolaides, K. H. (2010) 'Maternal risk factors for hypertensive

- disorders in pregnancy: a multivariate approach', *Journal of Human Hypertension*, 24(2), pp. 104–110. doi: 10.1038/jhh.2009.45.
18. Al-jumaily, H. F., Sarhan, Y. T. and Alhayani, A. K. (2017) 'Risk Factors of Pregnancy Induced Hypertension in Falluja City', *Al-Anbar Medical Journal*, 14(1), pp. 58–63.
 19. Mbouemboue, O. P., Cellou, D., Tamanji, M. T., Blakga, C., Kamdje, A. H. N., Ngoufack, J. O. and Youmbi, A. (2016) 'A Study on Factors Related to Hypertensive Disorders in Pregnancy in Ngaoundere (Adamawa Region , Cameroon)', *Clinical Medicine Research*, 5(2), pp. 6–12. doi: 10.11648/j.cmr.20160502.11.
 20. Hussian, M. H. and Saffar, F. A. A. A. (2016) 'Self-Care Management of Pregnancy Induced Hypertension for Pregnant Women Attending Primary Health Care Centers at Kirkuk City', *KUFA JOURNAL FOR NURSING SCIENCES*, 6(2), pp. 185–193.
 21. Kiondo, P., Wamuyu-Maina, G., Bimenya, G. S., Tumwesigye, N. M., Wandabwa, J. and Okong, P. (2012) 'Risk factors for pre-eclampsia in Mulago Hospital, Kampala, Uganda', *Tropical Medicine and International Health*, 17(4), pp. 480–487. doi: 10.1111/j.1365-3156.2011.02926.x.
 22. Assis, T. R., Viana, F. P. and Rassi, S. (2008) 'Study on the major maternal risk factors in hypertensive syndromes.', *Arq Bras Cardiol*, 91(1), pp. 11–16.
 23. Ayele, G., Lemma, S. and Agedew, E. (2016) 'Factors Associated with Hypertension during Pregnancy in Derashie Woreda South Ethiopia, Case Control', *Quality in Primary Care*, 24(5), pp. 207–213.
 24. Renee, S. and Fortner, T. (2009) *Modifiable Risk Factors for Hypertensive Disorders of Pregnancy Among Latina Women, University of Massachusetts - Amherst*.
 25. Nasr, E. H. (2016) 'Psychological Consequences of Hypertensive Disorders among Pregnant Women', *Scientific Research Journal (SCIRJ)*, 4(5), pp. 2201–2796.