

# Maternal risk factors for hypertensive disorders during pregnancy.

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## Abstract

**Background:** According to the World Health Organization (WHO), the prevalence of hypertension caused by pregnancy is seven times higher in developing countries (2.8% of live childbirth) than in developed nations 0.4%. The goal of the research was to find out the relationship between demographic and reproductive characteristics and risk factors.

**Methodology design:** "A descriptive-analytic non-probability study design" (purposeful sam-ple) of 80 pregnant with hypertension caused by pregnancy attending Al-Emam Al-Sadiq and Babylon teaching hospitals in "Al-Hilla City".

**Results:** The study findings showed that most of the samples 87.5% were housewives, 36.3% of them were primary school, 51.25% of the participants were urban and 45% were overweight. The highest % age of the sample reported and accounted for in the second trimester 46.3% and the highest % age 51.25% is 1-3 number of gravid. The highest % age 52.5% of the sample reported having no. of miscarriage 1-2, 53.75% of the sample eating salty food, even 60% was unhealthy foods, the highest % age of the sample 76.25%.

**Conclusion:** The highest % age of the sample reported eating salty food, their food was fatty. The highest % age has a family history of hypertension and they have urinary tract infection during pregnancy, there is an association between educational level, residency with dietary factors (p-value>0.05) while there was significantly associated between health history and occupation only. Also indicates that there is a highly significant association, between all reproductive variables, with "dietary factors except with parity".

**Recommendations:** Health education program about physiological changes during pregnancy and early detection: management of mothers with "PIH" should be required as part of focused antenatal care. The study suggests that further studies assess dietary and lifestyle factors.

**Keywords:** Maternal, Risk factors, Hypertensive disorders, Pregnancy.

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## Introduction

Hypertensive disorder of pregnancy is one of the greatest common complications in pregnancy forming a triplet together with infection and hemorrhage. It affects about 10% of pregnancies and contributes to significant perinatal and maternal mortality [1]. Hypertension is the most common pregnancy-associated disorder is complicating "2%-3%" of pregnancies occurs in "6%-8%" of all pregnancies it is a thoughtful cause of maternal and mortality in developing countries were associated as the most common medical health problems in pregnancy [2].

Important adaptations in the cardiovascular physiology of the mother are caused by hormonal differences in pregnancy. There is progesterone, estrogen, and relaxing floods (progesterone-like hormone; mediates release of nitric oxide) starting early in the 1st trimester, contributing to systemic vasodilation. At the same time, the Renin-Angiotensin-Aldosterone System (RAAS) is improved to produce salt and water retention, leading to plasma volume expansion [3-5].

Diabetes, persistent pre-pregnancy hypertension, chronic kidney diseases, nulliparity, twin or multiple pregnancies,

family history of preeclampsia or eclampsia, obesity, immune deficiencies, and personal history of preeclampsia or eclampsia are factors leading to preeclampsia. However, its initial development is related to a greater likelihood of it happening in subsequent pregnancies [6]. During pregnancy, vitamin D is particularly important because low maternal vitamin D stores can lead to problems such as low birth weight and small for babies of gestational age, as well as an increased risk of maternal comorbidities [7]. The incidence is seven times higher in developing countries 2.8% of live births than in developed countries 0.4%, according to the World Health Organization (WHO). Eclampsia is associated with a maternal mortality rate 0.5%-10% that typically needs high-quality intensive care [8].

## Methodology

"A descriptive-analytic non-probability study design "(purposeful sample) of 80 pregnant women with "PIH"attending; Al-Emam Al-Sadiq and Babylon, teaching hospital: in Al-Hilla City. A questionnaire was used as a data-gathering tool. The study carried out from (February–July 2020). Data collected through a questionnaire constructed for the purpose of this study, consists of 4 parts include; 5 items

related to socio demographic; 4 items of reproductive characteristics; 6 items of dietary risk factors and 5 items of health history; these items are rated according to two level Likert scale (Yes, No), scored 2,1 cut of point of score=1.5. Descriptive statistical and Inferential analyses are used to analyze the data were analyzed using the statistical package for social sciences ("SPSS version 20").

## Results

Table 1 depicts the highest percentage of the sample age at 32-36 years were house wife, primary educational level 51.25% of the participants were in urban and were just enough economics status.

Variables	Groups	Frequency	Percent (%)
Age	17-21	5	6.25
	22-26	10	12.5
	27-31	16	20
	32-36	24	30
	37-41	17	21.25
	42-46	8	10
	Total	80	100
Occupation	Not work	70	87.5
	Work	10	12.5
	Total	80	100
Education level	Not read and write	3	3.75
	read and write	12	15
	Primary	29	36.3
	Secondary	13	16.3
	Institute and over	23	28.75
	Total	80	100
Residence	Rural	39	48.75
	Urban	41	51.25
	Total	80	100
Economics status	Enough	29	36.3
	Just enough	44	55
	Not enough	7	8.8
	Total	80	100

**Table 1.** Women's socio demographic characteristics of pregnant women with PIH number 80.

Table 2 reveals that the highest percentage of the sample reported were 1-3 time of pregnancy, now in second trimester,

56.3% of the sample reported were birth number 2-4, they have 1-2 time of abortion.

Variables	Groups	Frequency	Percent (%)
Gestational age	First	9	11.25
	Second	37	46.3
	Third	34	42.5
	Total	80	100
Gravidity number	1-3	41	51.25

	4-6	31	38.75
	7-9	8	10
	Total	80	100
Parity number	1	34	42.5
	2-4	45	56.3
	5-8	1	1.3
	Total	80	100
Number of miscarriage	0	32	40
	1-2	42	52.5
	3-4	6	7.5
	Total	80	100

**Table 2.** Women's reproductive characteristics of pregnant women with PIH number 80.

Table 3 depicts that the highest percentage of the pregnant women reported eating salty food, eating vegetables, their food were fatty, 65.0% of them were taking fruit also were not

taking folic acid before pregnancy. The highest percentage of the sample reported not exposure vitamin D.

Variables	Groups	Frequency	Percent (%)
Eating salty food	No	37	46.25
	Yes	43	53.75
	Total	80	100
Eating vegetable	No	22	27.5
	Yes	58	72.5
	Total	80	100
Taking fatty food	No	32	20
	Yes	48	60
	Total	80	100
Fruit taking	No	28	35
	Yes	52	65
	Total	80	100
Taking folic acid before pregnancy	No	57	71.25
	Yes	23	28.75
	Total	80	100
Not exposure to Vitamin D	No	19	23.75
	Yes	61	76.25
	Total	80	100

**Table 3.** Dietary risk factors of pregnancy induce hypertension.

Table 4 reveals that the highest percentage of the participants has no history of gestational diabetes were not anemic, but have family history of hypertension, and 78.75% of the sample

don't have family history of diabetes but most of them with "UTI" during pregnancy.

Variables	Groups	Frequency	Percent (%)
Gestational diabetes of women	No	75	93.75
	Yes	5	6.25
	Total	80	100
Anemia	No	45	56.25
	Yes	35	43.75
	Total	80	100
Family history of hypertension	Yes	39	48.75
	No	41	51.25
	Total	80	100
Family history of diabetes mellitus	No	63	78.75
	Yes	17	21.25
	Total	80	100
UTI during pregnancy	No	21	26.25
	Yes	59	73.75
	Total	80	100

**Table 4.** Health history of pregnancy induces hypertension.

Table 5 shows that there is association between educational levels, residency with dietary factors but there was association health history with occupation only.

Relationships of dietary and health history with demographical characteristics	Dietary factors			Health history		
	CC	Sig	CS	CC	Sig	CS
Age groups	0.893	0.076	NS	0.744	0.796	NS
Educational level	0.834	0	HS	0.452	0.195	NS
Occupation	0.408	0.1	NS	0.333	0.04	S
Residency	0.429	0.054	S	0.221	0.391	NS
Socio-economic status	0.429	0.585	NS	0.332	0.269	NS

**Table 5.** Association between demographical characteristics with dietary and health history.

Table 6 reveals that there is a high significant association with parity number but there was no associated with all health between all reproductive variables with dietary factors except history.

Relationships of dietary and health history with reproductive characteristics	Dietary factors			Health history		
	CC	Sig	CS	CC	Sig	CS
Gestational age	0.75	0	HS	0.388	0.129	NS
Gravidity number	0.708	0	HS	0.211	0.88	NS

Parity number	0.478	0.27	NS	0.351	0.187	NS
Number of miscarriage	0.73	0	HS	0.257	0.804	NS

**Table 6.** Relationships of dietary and health history with reproductive characteristics. HS: Highly Sig. at P<0.01; S: Sig. at P<0.05; NS: Non Sig. at P>0.05.

## Discussion

### Related to socio-demographic characteristics

The highest percent of sample age between 32-36 years. This finding is not in the same line with Hafez et al. who found that most participants aged between 30-35 years but in agreement with Hafez et al. who found that most samples were not working [9]. Other studies have indicated that higher age is also a significant risk factor for hypertension during pregnancy, especially in developed countries Assis et al. and found that the risk of preeclampsia superimposed on chronic hypertension is associated with age above 30 years [10].

The largest percentage of the sample recorded at the primary education level. This outcome is in line with Mekonen et al. research which found that primary education was accounted 154 [8]. As for residence, the largest percentage of the sample was residing in urban areas with the economic status of just enough. This result is not in line with Kahsay et al. the study which found that rural residents were higher among the cases but is in line with Kahsay et al. the level of income.

Regarding reproductive characteristics; gestational age the highest percentage of the sample reported in the second trimester, and was a gravidity number 1-3, while parity number 2-4. This result is not in the same line with Hafez et al. who found that (59.6%) of the sample in the third trimester, also approximately half of them (47%) had between 5-11. while agreeing with gravidity number whereas found the gravidity number 1-3. but the result of this study related to gestational age is in the same line with Maputle et al. who found that 60.0% of the sample in the 2nd trimester [11]. Concerning, number of miscarriages the highest percentage of the sample reported they have 1-2 aborted. This result is in agreement with Hafez et al. showed that 35% had 2 or more previous abortions.

Concerning dietary risk factors; eating salty food the highest percentage of the sample reported eating salty food, and they are accounted for 53.75%. This result is not consistent with Shoukry et al. showed that 61.54% women are taking a low salt diet among all women who agreed that a high salt diet is a major cause of high BP [12]. Concerning, eating vegetables the highest percentage 72.5% of the sample were eating per day. This result is unlike with Kahsay et al. who showed that 57.3% of the sample was not using vegetables daily. Also, the current study showed that 65.0 % of the sample is taking fruit daily. The result of the current study consistent with 19 who found that 54.5% of participants taking fruit [13-19].

Regarding, eating fatty food the highest percentage of the sample was eating fatty food, and they are accounted 60% this

result in the same line with Kahsay et al. who reported that the most of study group consumption of trans fatty food and accounted 47.1 [20]. The highest percentage of the sample reported was not taking folic acid before pregnancy, and they are accounted for 71.25%. This finding inconsistent with Larry et al. who stated that most participants' preconceptions start the use of folic acid [21]. The highest percentage of the sample reported no exposure to vitamins D and they are accounted for 76.25%. This finding is inconsistent with Makhoulouf et al. who stated that most participants in the study group 49.4% take vitamins D [22].

Regarding health history , results of this study show that history gestational diabetes 93.75% of the sample free of history gestational diabetes, this result is in the same line with Kahsay et al. found that majority of the sample did not have gestational diabetes mellitus. Regarding, history of anemia the present study found that most samples were not having anemia 56.25% this result is in disagreement with Kahsay et al. found that the highest percentage 85.5% of them was the presence of anemia at the first visit [23]. Concerning, history of pregnancy-induced hypertension results of this study shows that 51.25% of the sample didn't have a history of pregnancy-induced hypertension [24]. This result is in the same line with Mekonen et al. who found that 94.1% of the sample did not have a history of pregnancy-induced hypertension. Most of the participants having urinary tract infections and this may be due to this common during pregnancy according to physiological changes during the conception [25].

### Part (5): Association between demographical characteristics with dietary and health history

The present study shows that an insignificant relationship between age and risk factors. This result disagrees with Kahsay et al. who found a significant relationship at P-value 0.006 between age groups and hypertensive disorders of pregnancy but in agreement with Kahsay et al. about association between residence and hypertensive disorders of pregnancy. Concerning, level of education and occupation the current study revealed that there is a significant relationship between maternal education and occupation and risk factors, the result of the current study is in the same line with Liu et al. found that high significant relationship between low educational level and risk factors p=0.0052 .

So, the study underhand depicts that there is not a significant relationship between economic status and risk factors. This result is in agreement with Kahsay et al. found that no significant relationship at P-value 0.8 between the Income category and hypertensive disorders of pregnancy. The present study report that no significant relationship between socio-

economic status and risk factors related to hypertension during pregnancy. This result not in the same line with Tebeu et al. found a significant relationship between income and pre-eclampsia.

### **Part (6): Relationship of dietary and health history with reproductive characteristics**

The current study shows that there is a significant relationship between the history of abortion and risk factors. This result is incongruent with Kahsay et al. found that no significant relationship at P-value 0.263 between abortion and hypertensive disorders of pregnancy. The current study report that the significant relationship between gravidity and risk factor of pregnancy-induced hypertension. This result is in agreement with O'Brien et al. who found a significant relationship between the distribution of hypertension disorders of pregnancy according to gravidity ( $p=0.040$ )

The present study revealed that the highest percentage of mother with hypertension eating fruit. This result is dis agreement with Kahsay et al. study found that mothers who consume less fruits in their diets were at higher risk of developing hypertensive disorders of pregnancy. The current study report that the highest % of mother doesn't have gestational diabetes and anemia. This result is not in same line with Kahsay et al. study found that mothers with gestational diabetes would have higher predisposition ( $p=0.02$ ), also the maternal with not anemic problem was not a significant risk factor for PIH. The present study report that highest % of mother doesn't have family history of chronic hypertension. This result is disagreeing with Timmermans et al. reported an increased risk of hypertensive disorders with a positive family history of chronic hypertension.

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