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Research Article

Public Awareness And Perceptions Of Pregnancy-Induced Hypertension Among Pregnant Women In Al-Madinah Region, Kingdom Of Saudi Arabia.

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Abstract

Background: Pregnancy-induced hypertension is associated with significant maternal and perinatal morbidity and mortality globally. However, no previous studies have examined awareness and perceptions of pregnancy-induced hypertension among pregnant women in the Al-Madinah region, Kingdom of Saudi Arabia.
Aim: To assess public awareness, knowledge, and attitudes toward PIH, and identified sources of PIH-related information among pregnant women in the Al-Madinah region, Kingdom of Saudi Arabia.
Methods: A descriptive cross-sectional study was carried out among 222 pregnant women attending antenatal care clinics in the Al-Madinah region. A structured self-administered questionnaire comprised of sociodemographic data, medical and obstetrical history, knowledge regarding pregnancy-induced hypertension, and attitude toward pregnancy-induced hypertension was used for data collection. Descriptive statistics and one-way ANOVA were used for data analysis.
Results: The majority of women (76.1%) had heard of PIH. The main sources of information were social media/internet and television (47.3% each). However, knowledge gaps were also established; only 45.9% correctly defined PIH, 44.1% were not aware of any risk factors, and only 35.1% were aware of its onset after 20 weeks of gestation. Signs and symptoms awareness was reported by 48.6%, and there was limited knowledge of comprehensive PIH management approaches 32.4%. The women had positive attitudes, with 92.8% emphasizing monitoring of blood pressure, and 91.9% seeking healthcare when symptoms occur. No statistically significant relationship was found between attitude scores and sociodemographic variable ($p>0.05$).
Conclusion: Pregnant women in Al-Madinah had high awareness and positive attitude PIH. Targeted, media-based educational measures should be integrated into routine antenatal care to address identified knowledge gaps.

Keywords: Pregnancy-induced hypertension, awareness, knowledge, attitudes, antenatal care, Saudi Arabia.

INTRODUCTION

Pregnancy-Induced Hypertension (PIH), commonly referred to as gestational hypertension or preeclampsia, is a severe ailment that manifests as high blood pressure most often around the 20th week of pregnancy. The effects of PIH are felt by both the mother and the unborn baby, with consequences including early delivery, low birth weight, or damage to maternal organs [1, 2]. Regrettable is the fact that many women still do not fully comprehend or perceive the severity of PIH despite the potential danger of it. Knowing the level of consciousness, knowledge, and attitudes about prenatal and infant health is necessary to identify early detection, timely intervention, and improved outcomes (3). Through exploration of female public consciousness and attitude regarding PIH, we can reveal the most attractive domains for education and vision, which are necessary for women to be equipped with information and assistance resources for their pregnancy safety and efficiency [4, 5].

Public knowledge and perceptions of PIH among females are important for the prevention, early detection, and management of this condition, which could be detrimental

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to life. Research has shown that uninformed aspects and misbeliefs about PIH can lead to incompetent seeking of medical care, inadequate follow-up during pregnancy, and increased risks for motherhood and the baby [6]. However, high knowledge is fundamental as it helps strive for better maternal health results and alleviates the increasing burdens posed by PIH on the healthcare system [5, 7, 8]. Through raising general knowledge about PIH symptoms, signs, and risk factors, women can become more knowledgeable and recognise the warning signs early on, which can prompt them to take the appropriate medical help. Moreover, when myths and misunderstandings about PIH are cleared up, anxieties and concerns that prevent women from accessing help and care as necessary are reduced [8-10].

Overcoming public awareness and perception issues concerning the PIH among females is a complex process that can only be dealt with through a multi-dimensional approach that addresses the cultural, social, and structural barriers that hinder access to knowledge and care. Studies conducted across different regions, including Ethiopia [8] and Morocco [6], have established that understanding the knowledge and attitudes regarding PIH among women is fundamental to the development of multi-dimensional approaches that may improve the knowledge, attitudes, and help-seeking behaviors. In Saudi Arabia, Radwan et al. [11] examined the knowledge and awareness of pre-eclampsia among Saudi women aged 18 to 49, found limited knowledge, and emphasized that addressing the established knowledge gap is significant for preventing pre-eclampsia-related maternal and foetal complications.

In brief, public awareness and perception towards PIH among females are the essential issues that will ensure maternal health, reduce pregnancy complications, and improve overall pregnancy outcomes. However, there was no empirical evidence on public awareness and perceptions of pregnancy-induced hypertension among pregnant women in the Al-Madinah region, Kingdom of Saudi Arabia. Therefore, through the filling of the information gap, the demolition of myths as well as the empowering of women with information and the resources needed to identify and manage PIH independently, the quality of hospital care can be improved, the distress among women during pregnancy can be lessened, and a congenial environment can be created that prioritizes the well-being of pregnant women.

The findings of this study can be used in developing integrated strategies that communicate self-awareness, early detection, and encourage women to be active in the management of their health during pregnancy. In addition, the findings will be used in developing an educational culture of support and motivation, screening women for possible health issues, and promoting proactive health seeking, thus leading to healthier outcomes for the mothers and babies. Hence, this study aimed to assess public awareness and perceptions of pregnancy-induced hypertension among pregnant women and identify the source of information regarding PIH among females in the Al-Madinah region, Kingdom of Saudi Arabia.

MATERIALS AND METHODS

This descriptive cross-sectional study was carried out in the Al-Madinah region, Kingdom of Saudi Arabia. The Al-Madinah region is a province in the western part of Saudi Arabia, situated along the Red Sea coast, covering about 700 sq km. It is a famous region and recognised as second holiest Islam city and the UNESCO World Heritage Site Hegra in Al-Ula. The region covers nine governorates and is a major region for religious tourism and historic Islamic sites, such as the Prophet's Mosque.

Population and sampling

The study targeted all pregnant females in the Madinah region of Saudi Arabia who were accessible during the study period. A consecutive sampling method was applied where all the eligible population who fulfilled the inclusion criteria were invited to participate in the study. A minimum sample size of 222 was required for data collection. The inclusion criteria were 1) residency in Madinah, Saudi Arabia; 2) aged 18 years or more; and 3) able to communicate and complete the questionnaire.

Data Collection Methods

All pregnant women in the Madinah region of Saudi Arabia were approached, and those who agreed to participate in the study were provided with informed consent forms. The objectives and procedures of the study were explained to the participants. Data collection was carried out while adhering to confidentiality and privacy, and data in the completed questionnaire were anonymized. Data was collected from eligible participants using a structured questionnaire. The questionnaire was developed by the researchers based on an intensive literature review and expert consultation. The questionnaire covered the following sections: Sociodemographic Data (6 items), medical and obstetrical history (5 items), knowledge regarding pregnancy-induced hypertension (12 items), and attitude toward pregnancy-induced hypertension (5 items). The knowledge items were multiple-choice and closed-ended, and scores were based on responses of " yes, no, " or " don't know'. The attitude items were scored using a 3-point Likert scale: "agree, neutral, disagree". The distribution of the questionnaires was conducted through online and email-based data collection means.

Data Analysis

The data collected was reviewed and edited, checked for completeness, before being fed to the Statistical Package for the Social Sciences (SPSS). Descriptive statistics such as means, standard deviation, and ranges were analyzed for scale variables, while frequency distribution was used for qualitative variables. Socio-demographic variables in relation to the attitude scores towards PIH were analyzed using a one-way ANOVA test, with a statistical significance value of $p<0.05$.

Ethical considerations

This study was conducted in accordance with the Helsinki Declaration's ethical research principles. The study was ethically approved before data collection process begun. Informed consent was obtained from the respondents. Confidentiality was maintained through the research process; no identification data was collected and all collected data were protected and accessible to authorized personnel only.

RESULTS

Sociodemographic Data

The table 1 describes the socio-demographic characteristics of 222 pregnant women. The findings indicate that most of them (43.7%) are aged between 18-34 years, 38.3% years are aged between 35-44 years old, and 18% are aged 45 and above. The marital status shows that most of them are married (88.7%), a low percentage are single (7.2%), and divorced/widowed (4.1%). At the educational level, a good percentage (64.4%) of them are bachelor's degree holders or higher, with a smaller percentage being secondary school holders (26.1%), middle school holders (5.9%), and the lowest percentage completed elementary school (3.6%). Occupational status shows that 57.7% percent are unemployed, 27% are employed, and 12.2% are students. Responses in monthly income indicate that more than half of the respondents (55.9%) make less than 3000 units, with fewer women making between 3000-6000 (17.1%), 6000-10000 (12.6%). The group with lower income earns less than 10000 per month (14.4%).

Table 1. Socio-Demographic Characteristics of Study Participants (n = 222).

Socio-demographic data	No.	%
Age		
18-34	97	43.7
35-44	85	38.3
45 or above	40	18.0
Gender		
Male	0	0.0
Female	222	100.0
Marital status		
Single	16	7.2
Married	197	88.7
Divorced /widow	9	4.1
Educational level		
Elementary school or below	8	3.6
Middle school	13	5.9
Secondary school	58	26.1
Bachelor's degree or higher	143	64.4
Occupation		
Student	27	12.2
Employee	60	27.0
Retired	7	3.2
Unemployed	128	57.7
Monthly income		
<3000	124	55.9
3000-6000	38	17.1
6000-10000	28	12.6
>10000	32	14.4

Medical and Obstetrical history

The medical and obstetric history of the participants is indicated in Table 2. Most of the women (76.1%) have no chronic health issues, although 15.3% have hypertension, 5.4% diabetes mellitus, and autoimmune diseases (2.7%) or other chronic issues (4.1%). Pregnancy history 72.5% of the respondents show between 1 and 4 pregnancies, and 27.5% have more than four pregnancies. Regarding the number of children, 18.9% do not have any children, 59.9% have 1-4 children, whereas 21.2% have more four children. The prevalence of pregnancy-induced hypertension (PIH) among women is low (15.3%). All the participants (222) are in the pregnancy stage.

Table 2. Medical and Obstetric History of Study Participants (n = 222).

Medical and Obstetrical history	No.	%
Do you have any chronic health problems? #		
Hypertension	34	15.3
diabetes mellitus	12	5.4
Autoimmune disease	6	2.7
Others	9	4.1
No	169	76.1
How many times have you gotten pregnant?		
0	0	0.0
1-4	161	72.5
>4	61	27.5
How many children do you have?		
0	42	18.9
1-4	133	59.9
>4	47	21.2
Do you ever diagnose as PIH?		
Yes	34	15.3
No	188	84.7
Are you pregnant?		
Yes	222	100.0
No	0	0.0

Note: #= more than one answer

Knowledge regarding Pregnancy-Induced Hypertension

Table 3 provides the details of the knowledge of the participants regarding pregnancy-induced hypertension (PIH). Most of the respondents (76.1%) are aware of PIH, with 47.3% being aware via social media/internet and 47.3% via television, and fewer obtained their information from work (19.4%), and books (12.2%). However, on the definition of PIH, only 45.9% define it correctly, and 51.8% are not aware of the correct definition of PIH. Similarly, in the classification of PIH, 45.5% of the participants provided correct answers. Moreover, 58.1% thought that PIH can be cured after birth, and 64.9% thought that PIH is a severe threat to the mother and the fetus. The knowledge gap is observed when determining the risk factors of PIH because many of the women do not know other conditions, such as hypertension (38.7%) or obesity (33.8%). The knowledge regarding the PIH management is limited to 40.1%, and the awareness of the use of all the possible measures, including antihypertensive management in PIH management, is recognized by only 32.4%.

Table 3. Participants' Knowledge Regarding Pregnancy-Induced Hypertension (n = 222).

Section 2: knowledge regarding PIH	No.	%
Heard of PIH?		
Yes	169	76.1
No	53	23.9
What is the source of your information? #		
Work	43	19.4
Social media /internet	105	47.3
Television	105	47.3

Books	27	12.2
Awareness campaigns	31	14.0
Others	19	8.6
PIH is systolic blood pressure (SBP) >140 mmHg and diastolic blood pressure (DBP) >90 mmHg		
Yes	102	45.9
No	5	2.3
Do not know	115	51.8
The broad classification of pregnancy-induced hypertension during pregnancy is gestational hypertension, pre-eclampsia, and eclampsia.		
Yes	101	45.5
No	5	2.3
Don't know	116	52.3
When PIH can start to occur		
Before 20 weeks of gestation	15	6.8
After 20 weeks of gestation	78	35.1
Don't know	129	58.1
Do you think that PIH can be healed after delivery or a few weeks after delivery?		
Yes	129	58.1
No	6	2.7
Don't know	87	39.2
Which of the following conditions could be a risk factor for having PIH?#		
Hypertension	86	38.7
Primigravida	32	14.4
Obesity	75	33.8
Age more than 30 years	51	23.0
insulin resistance	0	0.0
diabetes mellitus	42	18.9
gestational diabetes	43	19.4
Thrombophilia	25	11.3
Antiphospholipid syndrome (APS)	30	13.5
history of PIH in previous pregnancies	83	37.4
Don't know	98	44.1
Do you know any signs or symptoms of PIH?		
Yes	108	48.6
No	19	8.6
Don't know	95	42.8
PIH has a serious complication for the mother and her fetus :		
Yes	144	64.9
No	3	1.4
Don't know	75	33.8
Can PIH be treated?		
Yes	136	61.3
No	5	2.3
Don't know	81	36.5
Do you know any management of PIH?		
Yes	89	40.1
No	27	12.2
Don't know	106	47.7
Measures for PIH management include: #		
Conservative management	27	12.2
antihypertensive	64	28.8

Anticonvulsive	13	5.9
All	72	32.4
Don't know	98	44.1

Attitude toward Pregnancy-Induced Hypertension (PIH)

Table 4 provides the attitudes of the respondents to pregnancy-induced hypertension. A significant percentage (75.2%) agreed that PIH has a high risk of fatality, and 92.8 % of them believed that regular antenatal screening of blood pressure is valuable. Moreover, 91.9% report that they plan to visit a health facility in case of PIH manifestations, and 77.5% accept that PIH is preventable. The results further show that 87.8% attached value to the antenatal care in early identification of PIH. The general attitude scores in relation to PIH have been reported in Table 5. The minimum score was 5, and the maximum score is 15, with an average score of 5.90 +-1.57. The median was 5.0, indicating that most of the participants have moderate positive attitude. Attitude has an average of 9.01% and a standard deviation of 15.69. These scores indicate that the majority of participants agreed that early detection and management of PIH are important.

Table 4. Participants' Attitude Toward Pregnancy-Induced Hypertension (n = 222).

Q		Agree		Neutral		Disagree		Mean	SD.
		No.	%	No.	%	No.	%		
1	PIH carries a high risk of death	167	75.2	46	20.7	9	4.1	1.29	0.54
2	Frequent antenatal check-ups for blood pressure are important	206	92.8	12	5.4	4	1.8	1.09	0.34
3	I will go to a health facility if I have signs of PIH	204	91.9	12	5.4	6	2.7	1.11	0.39
4	Can PIH be prevented?	172	77.5	41	18.5	9	4.1	1.27	0.53
5	Antenatal care important for early detection of PIH	195	87.8	21	9.5	6	2.7	1.15	0.43

Table 5. Overall Attitude Score Toward Pregnancy-Induced Hypertension (n = 222).

	Total score			Average Score	% score	
	Min. – Max.	Mean ± SD.	Median	Mean ± SD.	Min. – Max.	Mean ± SD.
Overall Attitude	5.0 – 15.0	5.90 ± 1.57	5.0	1.18 ± 0.31	0.0 – 100.0	9.01 ± 15.69

SD: Standard deviation

Correlation Between the overall score on the attitude towards PIH and socio-demographic

Table 6 examined the socio-demographic variables in relation to the attitude scores towards PIH. The analysis shows that there is no significant difference in the attitude scores of ages (p=0.350), marital status (p=0.188), educational level (p=0.640), occupation (p=0.206), or monthly income (p=0.487); all the p-values are above 0.05. This indicates that the socio-demographic variables measured have no significant impact on the attitude of the participants towards PIH.

Table 6. Relationship Between Socio-Demographic Characteristics and Attitude Toward Pregnancy-Induced Hypertension (n = 222).

Socio-demographic data	N	Total score for Section 3: Attitude toward PIH	F	p
		Mean ± SD.		
Age				
18-34	97	5.97 ± 1.62	1.054	0.350
35-44	85	5.98 ± 1.75		
45 or above	40	5.58 ± 0.84		
Marital status				
Single	16	5.56 ± 0.73	1.685	0.188
Married	197	5.96 ± 1.64		
Divorced /widow	9	5.11 ± 0.33		
Educational level				

Elementary school or below	8	6.25 ± 2.05	0.563	0.640
Middle school	13	6.15 ± 1.77		
Secondary school	58	6.03 ± 2.10		
Bachelor's degree or higher	143	5.80 ± 1.25		
Occupation				
Student	27	6.37 ± 2.29	1.536	0.206
Employee	60	5.63 ± 1.38		
Retired	7	5.57 ± 0.79		
Unemployed	128	5.95 ± 1.49		
Monthly income				
<3000	124	5.98 ± 1.43	0.815	0.487
3000-6000	38	6.05 ± 1.79		
6000-10000	28	5.54 ± 1.35		
>10000	32	5.75 ± 1.97		

SD: Standard deviation *F: F for One-way ANOVA test*

p: p-value for comparison between the studied categories

DISCUSSION

This study assessed public awareness and perceptions of pregnancy-induced hypertension among pregnant women and identified the source of information regarding PIH among females in the Al-Madinah region, Kingdom of Saudi Arabia. The majority of respondents in this study (76.1%) reported having heard of PIH, which is higher compared to 58.0% reported by Berhe et al. among pregnant women in Tigray Regional State, Ethiopia [8], and considerably higher compared to unawareness established among Moroccan women in Morocco and the Netherlands, where half of the respondents had never heard of hypertension in pregnancy [6]. The comparatively high level of general PIH awareness among respondents in the current study may be associated with the relatively higher level of education among most of them who had attained a bachelor's degree or above, and the significant role of social media and television as sources of information cited by 47.3% of respondents. However, the current results on sources of information contradict the findings reported in sub-Saharan Africa, where health facilities were the main source of PIH-related information [8] and reflect the wider accessibility of digital health information in Saudi Arabia.

Despite the high levels of general awareness among women, the current study noted critical gaps in substantive knowledge. Only 45.9% of participants provided a correct definition of PIH in terms of blood pressure thresholds, and only 45.5% also were able to provide accurate subtypes. These findings are consistent with the systematic review and meta-analysis conducted by Nigate et al. [12], which found a pooled PIH awareness of 45.63% across African studies, and with a study carried out in Saudi Arabia by Radwan et al. (11), where only 11.3% of participants showed adequate awareness of pre-eclampsia, while 49.4% reporting inadequate knowledge. These findings underscore the presence of and persistent geographically widespread differences between awareness of the PIH concept and accurate clinical knowledge [13, 14].

Regarding the onset of PIH, current findings show that 35.1% participants correctly identified that it occurs after 20 weeks of gestation, while 58.1% indicated being unaware of its timing. This awareness is lower compared to 69.1% correct response rate reported among women in Saudi Arabia by Radwan et al. [11]. However, it is similar to the results of Berhe et al., in Ethiopia, where 78.0% were not aware of the PIH onset [8]. The presence of this knowledge gap implies that antenatal education programmes provide inadequate emphasis on the gestational period for PIH onset. Our findings established limited knowledge of PIH risk factors; as 44.1% of participants reported not knowing any risk factors, while only 38.7% identified pre-existing hypertension, and 33.8% obesity. This is consistent with the results of studies conducted in South Africa, where women had significant knowledge deficits related to PIH risk factors [5, 10]. Notably, insulin resistance was not identified by any respondent as a risk factor for PIH, suggesting a significant gap in awareness about the contribution of metabolic factors in PIH development

Awareness of the signs and symptoms was reported by 48.6% of participants, aligning broadly with the previous studies indicating that pregnant women were able to identify at least one sign or symptom of PIH; however, the symptom and sign recognition continue to be suboptimal across the populations [8, 15, 16]. Furthermore, regarding severity and treatment of PIH, our findings show that 64.9% of participants acknowledged that PIH has serious complication to mother and fetus, and 61.3% were aware that it can be treated. These findings are congruent to the 70.7% among women in Ethiopia, who were aware of treatment possibilities of PIH (8). However, there was limited awareness of specific management strategies, with only 40.1% reporting awareness of any approach, and all management strategies, such as antihypertensive and

anticonvulsant therapy, were established among 32.4% in this study. These findings are consistent with other studies where knowledge of specific therapeutic interventions was found to be low among respondents [17-20].

Regarding attitudes towards PIH, our findings reported that the majority of the respondents had positive attitudes. The current findings highlight that 75.2% agreed that PIH has a significant risk of fatality, and 92.8% of them emphasized the significance of frequent antenatal blood pressure monitoring and antenatal care for early PIH detection (87.8%). Furthermore, 91.9% reported their intentions of seeking care when experiencing PIH symptoms, and 77.5% affirmed their perceptions of PIH as a preventable condition. These positive attitudes are congruent with attitudes among women in Ethiopia, where 89.9% of participants reported a positive perception of the significance of seeking care when PIH symptoms occur [8], and in South Africa, where women with previous pregnancy experiences had positive attitudes toward PIH [10]. These positive attitudes are significant for public health interventions, suggesting that the willingness of pregnant women to engage with healthcare and accept measures for PIH prevention is prevalent among the studied population. However, negative attitudes toward PIH have been reported among women in Rwanda [16] and in Ethiopia [17]. Our findings established no statistically significant relationship between attitude and sociodemographic characteristics. This contradicts previous findings where educational level, occupation, and wealth index were significantly associated with PIH awareness and attitudes [16, 17, 21]. Such a lack of associations in the present study could be reflective of the relative homogeneity of the study population, with the majority of that population being married, possessing a bachelor's degree or higher, and living in an urban setting, factors which can reduce the effects of any individual sociodemographic variable on attitude outcomes. There is also a possibility that attitude, compared to knowledge, is less prone to change by sociodemographic profile, especially when cultural and religious norms of pregnancy and health-seeking behaviour are widely shared. This explanation is in line with the finding by Ouasmani et al. [6] that even women who had limited knowledge about PIH universally recognized the need to be informed and were willing to seek care regardless of their educational or geographical background.

CONCLUSION

The present findings highlight important findings regarding knowledge and perceptions of pregnancy-induced hypertension among pregnant women. Although most pregnant women in the Al-Madinah region had heard about PIH, there was still a limited understanding of the definition of PIH, the onset of gestation, risk factors, symptomatology, and management options. Social media and TV were the dominant sources of information, with critical implications on how health education messages could be framed and disseminated in this population. The participants had positive attitudes towards the use of antenatal monitoring, health facility utilisation, and PIH prevention. These findings suggest that targeted, media-integrated awareness campaigns that extend beyond surface knowledge should be developed by healthcare providers and policymakers in the Al-Madinah region and the wider Saudi context. Longitudinal and interventional designs should be used in future studies to determine whether targeted education can lead to increased knowledge, permanent attitude change, and better maternal and foetal outcomes.

Acknowledgments

Conflicts of Interest

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