

## Knowledge of public health nurses on hypertensive disorders of pregnancy in Riyadh City: A cross-sectional study

Salihah Ali Al Sharif<sup>1</sup>, Zahra ahmed alosimi<sup>1</sup>, Ebtehal Faraj Ali Majrashi<sup>1</sup>, Shouq Mohmmad Alkhalifah<sup>1</sup>, Fatma Salem Alfageer<sup>1</sup> and Medel O. Cabalsa<sup>2,\*</sup>

<sup>1</sup> College of Nursing, Department of Nursing, Riyadh Elm University, Riyadh City, Saudi Arabia.

<sup>2</sup> Higher Education Professor in Nursing, Department of Nursing, Riyadh Elm University, Riyadh City, Saudi Arabia.

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### Abstract

**Introduction:** One of the common causes of maternal mortality is the medical disorder in pregnancy known as hypertensive disorders of pregnancy. Since hypertension complicates an estimated 10 percent on all pregnancies, the healthcare professionals' role is of major public health concern. The knowledge on hypertensive disorders of pregnancy (HDPs) among public health nurses is an important part of serving the community to address the complication. The primary aim was to assess the level of knowledge of the public health nurses on hypertensive disorders of pregnancy.

**Methods:** A cross-sectional research design was used to assess the knowledge of nurses working in primary healthcare level regarding HDPs. The purposive sampling was utilized in selecting 280 registered nurses working in primary health centers. The sample was taken using Slovin's formula with 5% margin of error. The data were analyzed with Spearman rho using SPSS version 23. Significance was determined at 5% level (P-value  $\leq 0.05$ ).

**Results:** The public health nurses were highly knowledgeable (3.29) in the definition of hypertension in pregnancy as well as in appropriate patient positioning for current readings of blood pressure (3.37). Despite the level of knowledge, determining the clinical manifestation of severe pre-eclampsia got the lowest mean (2.59).

**Conclusion:** The nurses working in primary health center have adequate knowledge about hypertensive disorders of pregnancy including assessing, diagnosis and management while need additional knowledge on identifying the clinical manifestation of severe pre-eclampsia.

**Keywords:** Assessment; Diagnosing; Hypertensive Disorder; Knowledge; Pregnancy; Public Health Nurse

### 1. Introduction

Hypertensive disorders of pregnancy is the greatest single cause of maternal mortality worldwide [1]. In Saudi Arabia, the prevalence of hypertensive disorders of pregnancies (HDPs) relating to maternal complications accounted for 9.4 percent. Retrospectively, studies have shown that the most prevalent subtype of HDP was preeclampsia (54.9%) while 29.5% of the women had gestational hypertension, and 8.0% had eclampsia. The prevalence of subtypes of HDP differed significantly with gravidity, and mean age differed significantly with HDP subtype [2]. According to the UNICEF, the maternal death rate in the Middle East accounted for 110 per 100,000 births in 2015.

In Saudi Arabia, the maternal deaths is 17 percent in 2017. As a result, a good antenatal care understanding that is combined with skills would result in a decrease in death [3]. The roles of public health nurses in healthcare centers are essential in the prevention and management of hypertensive disorders of pregnancy. Since they are in the forefront of

\* Corresponding author: Medel O. Cabalsa

the primary care, the public health nurses' knowledge is critical in everyday patient care. The Saudi Arabia's aim of lowering maternal death would still necessitate a lot of effort and advanced institutional regulation. In the current Sustainable Development Goals (SDGs) agenda through 2030, maternal death reduction remains the top priority target for ensuring safe lives and promoting well-being for all people of all ages. The World Health Organization issued strategies for ending preventable maternal mortality (EPMM) in February 2015 [4], a direction-setting study detailing global priorities and strategies for reducing maternal mortality under the Sustainable Development Goals[5]. Specifically, maternal death and illness are linked to poor assessment and diagnosis and management skill practices, as well as inadequate thorough understanding by midwives in many healthcare facilities [6]. These events have shifted from hemorrhage and infection to hypertensive disorders of pregnancies which have led to 25% of maternal deaths in the country [7].

Among the top four causes of maternal deaths were labor complication, postpartum hemorrhage, illegal abortion, and pregnancy-related hypertension [8]. To this date, studies on nurses' knowledge of hypertensive disorders of pregnancies in Riyadh are few or have never been done. A lack of information about hypertension disorders in pregnancies (HDPs) especially in knowledge, assessment and diagnosis, and management care could result in problems such as misdiagnosis and delayed referrals. Furthermore, this study aims to determine the significance between profiles and knowledge of public health nurses on hypertensive disorders of pregnancy. The researchers are hoping that the results of the study will serve as a baseline assessment tool to improve the knowledge of nurses on HDPs.

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## 2. Material and methods

### 2.1. Implementation methods and data collection

This study focused on determining the level of knowledge of public health nurses on hypertensive disorders of pregnancy in selected primary health center in Riyadh Region. This utilized survey-type cross-sectional design of research. The public health nurses working in selected government health centers were used as the study participants of the study. Only primary health centers (PHC) accredited by (CBAHI) Saudi Central Board for Accreditation of Healthcare Institutions were part of this study.

Using purposive sampling technique, the researchers have chosen 280 registered nurses working on selected primary health centers as a public health nurse which served as the total sample size of this study. The number of respondents was calculated using Slovin's formula with 5% margin of error. The following eligibility criteria was used. Inclusion criteria includes: Female nurse since they are in contact primarily in pregnant women; Graduate of Bachelor of science in Nursing or higher in educational qualification; Regular status as public health nurse working in primary health center under study; (4) working in PHC accredited by CBAHI; License nurse in Saudi Council of any classification; Both Saudi and Non-saudi nurses. The exclusion criteria includes: Male nurse working in the primary health center due to cultural considerations; Any profession other than nursing; unaccredited by CBAHI; Nurses working in private health centers; Unwilling to participate during the conduct of this study.

The main data collection tool was adapted from Stellenberg & Ngwekazi (2016) regarding knowledge on hypertensive disorders during pregnancy. It was translated in both English and Arabic for easy understanding of the questionnaire. The questionnaire is consisting of 2 parts, the demographic profile and knowledge on Hypertensive Disorders of Pregnancy (HDP). It has a 4 point Likert scale such as: (4) Highly knowledgeable; (3) Knowledgeable; (2) Slightly knowledgeable; (1) Not knowledgeable.

Ethical approval from Institutional Review Board (IRB) of Riyadh Elm University was taken for the study. Written informed consent was obtained from each respondent before data collection. Confidentiality and anonymity were assured and maintained. Upon approval of permission to conduct the study, the researchers explained the purpose of the study to the public health nurses and administered the questionnaire to them. The researchers used an

online tool using Google forms in the data collection process. The researchers made 2 follow up for the completion of data gathering and retrieved for a period of two months. After completion, data was entered in statistical package for social science (SPSS) version 23.0, analyzed and interpreted in terms of descriptive (Frequency, percentage, mean, median, standard deviation) and inferential statistics (Spearman rho).

### 3. Results and discussion

This part provides the main findings of the study after the data analysis. This presents the organize data presented in table form. This part helps the reader to understand the research data and explain its meaning. Through reading, this highlights the important findings of the study.

**Table 1** Demographic characteristics of the respondents as to gender

Variable	Frequency	Percentage
Female	195	66.78%
Male	97	33.22%
<b>Total</b>	<b>292</b>	<b>100%</b>

Table 1 shows the demographic profile of the respondents in terms of gender. It can be inferred from the table that majority of the respondents were female nurses than male nurses working in primary health center in Riyadh. Two third (2/3) of the respondents of the study comprised female public health nurses (67%) while male public health nurses only (33%).

**Table 2** Demographic characteristics of the respondents as to qualification level

Variable	Frequency	Percentage
Nurse Technician	94	32.19%
Nurse Specialist	130	44.52%
Senior Specialist	48	16.44%
Nurse Consultant	19	06.51%
<b>Total</b>	<b>292</b>	<b>100%</b>

The above table presents the demographic profile of the respondents in terms of qualification level. Based on the results, almost half of the public health nurses working in the primary health center were nurse specialist as per category of the Saudi Council for Health Specialties. Considering the work of the public health nurses, nurses specialist comprised of 45% which predominantly the main requirement when working to a government institution.

**Table 3** Demographic characteristics of the respondents as to length of experience

Variable	Frequency	Percentage
Less than 1 year	149	51.02%
1 to 5 years	80	27.40%
6 to 10 years	47	16.10%
More than 10 years	16	5.48%
<b>Total</b>	<b>292</b>	<b>100%</b>

The table 3 illustrates the demographic profile of the public health nurses in terms of length of experience. It can be seen on the table that 149 of the respondents are public health nurses with less than 1 year of experience. This comprised 50% of the total sample of the study. Meanwhile, 27% of the respondents have 1 to 5 years length of experiences in the primary health center. Only 5% of the public health nurses have more than 10 years of experience in government health centers.

**Table 4** Knowledge of Public Health Nurses on Hypertensive Disorders of Pregnancy

Indicators	Weighted	Description
Definition of hypertension in pregnancy	3.29	Highly knowledgeable
Definition of gestational hypertension	2.93	Knowledgeable
Definition of chronic hypertension	3.02	Knowledgeable
Definition of eclampsia	2.84	Knowledgeable
Understanding of pre-eclampsia	2.90	Knowledgeable
Major risk factors associated with development of pre-eclampsia	2.91	Knowledgeable
Maternal effects of pre-eclampsia	2.70	Knowledgeable
Fetal effects of eclampsia	2.80	Knowledgeable
Definition of proteinuria	2.98	Knowledgeable
<b>Total Average Mean</b>	<b>2.93</b>	<b>Knowledgeable</b>

The table above represents the knowledge of public health nurses about hypertensive disorders of pregnancy. Based on the table, the public health nurses were highly knowledgeable about hypertension in pregnancy with average mean of 3.29. This means that nurses have understanding on the blood pressure during pregnancy as well as its causes. Studies have shown that nurses were knowledgeable in hypertension during pregnancy. Study revealed that in terms of normal range of blood pressure, 98% were highly knowledgeable and 92% were found highly knowledgeable in the causes of hypertension during pregnancy [9]. However, the primary health nurses got the lowest average mean of 2.70 to the maternal effects of pre-eclampsia. Similarly, research has found that health professionals have limited knowledge about pre-eclampsia and eclampsia among midwives and doctors caring for pregnant women with pregnancy induced hypertension [10].

**Table 5** Knowledge of Public Health Nurses on the Assessment and Diagnosis of Hypertensive Disorders of Pregnancy

Indicators	Weighted	Description
Subjective data pertaining to medical history	2.96	Knowledgeable
Social history of pregnant women	2.79	Knowledgeable
Clinical manifestation of pre-eclampsia	2.62	Knowledgeable
Clinical manifestation of severe pre-eclampsia	2.59	Knowledgeable
Assessment of edema in pregnant women with hypertension	2.85	Knowledgeable
Understanding pitting edema	2.93	Knowledgeable
Factors affecting blood pressure reading	3.04	Knowledgeable
Appropriate patient position for current readings of blood pressure	3.37	Highly knowledgeable
Using the same position for current reading of blood pressure	2.76	Knowledgeable
Type of test for pre-eclampsia	2.71	Knowledgeable
Test for assessing fetal status	2.76	Knowledgeable
Laboratory test to diagnose pre-eclampsia	2.93	Knowledgeable
<b>Average Mean</b>	<b>2.86</b>	<b>Knowledgeable</b>

The table 5 illustrates the knowledge of Public Health Nurses on the assessment and diagnosis of hypertensive disorders of pregnancy. It shows that nurses were knowledgeable in assessment and diagnosis of hypertensive disorders of pregnancy with an average mean of 2.86. The results have shown that the respondents were highly knowledgeable

(mean-3.37) in the appropriate patient position for current readings of blood pressure. The blood pressure can drop in standing position other than the other position like sitting, supine and supine with crossed legs [11]. Further, they also explained that in assessing the blood pressure, the health professional should take the position of the patient in consideration as it should be in the level of the heart. The proper position on taking blood pressure in prenatal explained that the patient feet supported for 2-3 minutes before the pregnant blood pressure is measured. The patient both arms must be taken with blood pressure while right arm is considered if there are no differences on the blood pressure [12].

On the other hand, the researchers have found that clinical manifestation of severe pre-eclampsia (mean-2.59) and clinical manifestation of pre-eclampsia (mean-2.62) got the lowest average in assessing and diagnosis of hypertensive disorder in pregnancy. Although it range under knowledgeable, this suggest that educational program to increase their level of knowledge. The development and implementation of educational training program can increase the level of knowledge of healthcare professionals [10].

**Table 6** Knowledge of Public Health Nurses on Management of Hypertensive Disorders of Pregnancy

Indicators	Weighted	Description
Prevention of pre-eclampsia	2.89	Knowledgeable
Advice to women with pre-eclampsia regarding their diet	2.77	Knowledgeable
Type of suitable relaxation for pregnant women with hypertension	2.64	Knowledgeable
Encouraging bed rest	2.83	Knowledgeable
Consultation by nurses	2.63	Knowledgeable
Treatment of pre-eclampsia	2.64	Knowledgeable
Route to be used for the administration of magnesium sulfate	2.69	Knowledgeable
<b>Average Mean</b>	<b>2.72</b>	<b>Knowledgeable</b>

The table 6 presents the knowledge of public health nurses on management of hypertensive disorders of pregnancy. This shows that public health nurses were knowledgeable with regards to the management of patient with hypertensive disorders of pregnancy with overall average mean of 2.72. Based on the table, it can be seen that the highest mean that the respondents got were on the prevention of pre-eclampsia with average mean of 2.89. This means that the respondents have knowledge on the prevention of pre-eclampsia. Next to the highest is the encouraging bed rest with an average mean of 2.83. However, the consultation by nurses got the lowest average mean of 2.63. Studies have shown that 17% of nurses had optimal knowledge on management of preeclampsia [13].

**Table 7** Association between Knowledge on Hypertensive Disorders of Pregnancy and their Gender

Knowledge on HDP	rho	Interpretation	p-value
Knowledge about Hypertensive Disorder	0.335	Significant	0.032
Assessment and Diagnosis of HDP	0.163	Not significant	0.234
Management of HDPs	0.184	Not significant	0.247

The table above shows the significant relationship between knowledge on hypertensive disorders of pregnancy and their gender. It was found that male and female differ significantly in terms of the knowledge about hypertensive disorders of pregnancy. This means that sex is a predictor in the knowledge about hypertensive disorders of pregnancy. It is significant since the rho value is higher than the p-values resulting to significant differences. Similarly, study about the knowledge and awareness on pregnancy related hypertension revealed that their knowledge is high level [14]. The level of knowledge has a vital role in decreasing the risk of the pregnant women in the disease. It is also important that they understand their disease condition in order to implement an appropriate health-seeking behavior [15].

Meanwhile, it shows that gender is not a factor in determining the knowledge on the assessment and diagnosis as well as the management of hypertensive disorder in pregnancy. Results have shown that male and female do not differ significantly since the rho value is lower than the p-values ( $rV < pV$ ). In contrast, previous studies have revealed that the

respondents has poor knowledge on gestational hypertension and average knowledge on measures of self-care about gestation hypertension [16].

**Table 8** Association between Knowledge on Hypertensive Disorders of Pregnancy and their Qualification

Knowledge on HDP	rho	Interpretation	p-value
Knowledge about Hypertensive Disorder	0.254	Significant	0.105
Assessment and Diagnosis of HDP	0.314	Significant	0.121
Management of HDPs	0.319	Significant	0.206

The table 8 represents the significant relationship between knowledge on hypertensive disorders of pregnancy and their qualification. According to the result above, the level of qualification is a factor in determining the level of knowledge about hypertensive disorders of pregnancy. It was revealed that since the rho value is higher than the p-values ( $rV > pV$ ), the null hypothesis is rejected resulting to a significant relationship. This means that all qualification level differs on their level of knowledge about hypertensive disorders of pregnancy, its assessment, diagnosis and management. This is not surprising since most studies revealed that level of education is a predictor of level of knowledge. Additionally, the health professionals differ on their level of knowledge. Despite the favorable understanding, proper assessment, diagnosis and management are the keys to minimize effects of this pregnancy disorder. There can be serious repercussions once hypertensive disorder is poorly managed. It is encourage that healthcare professionals should intensify the clients teaching and education to pregnant women for early identification and prompt treatment to reduce negative outcomes [17].

**Table 9** Association between Knowledge on Hypertensive Disorders of Pregnancy and their Length of Experience

Knowledge on HDP	rho	Interpretation	p-value
Knowledge about Hypertensive Disorders of Pregnancy	0.283	Significant	0.117
Assessment and Diagnosis of HDP	0.224	Significant	0.107
Management of HDP	0.313	Significant	0.076

The above table presents the significant relationship between the knowledge on hypertensive disorders of pregnancy and their length of experience. It can be inferred with the data results that despite differences on the respondents' length of experience, they do differ significantly on the knowledge, assessment and diagnosis and management of hypertensive disorders of pregnancy. Since the rho value is higher than the p-values ( $rV > pV$ ), it resulted to significant relationship. This suggests that length of experience is a factor in determining the level of knowledge on HDPs. There is adequate knowledge on maternal complication in pregnancy. In terms of length of employment, it was found that there is a positive correlation between knowledge and length of employment. However, it contradicts on the study in Ghana where majority of the study participants have inadequate knowledge regarding the complication of hypertensive disorders of pregnancy (HDPs). While having inadequate knowledge on complications but almost 90% of the respondents identified seizure as the common complication of HDPs [18].

#### 4. Conclusion

The Public Health Nurses have adequacy of knowledge about Hypertensive Disorders of Pregnancy including assessing, diagnosis and management. Gender is not a factor on the level of knowledge on HDPs while qualification level and length of experience is a predictor of knowledge on assessing, diagnosis and management of hypertensive disorders of pregnancy. In addition, the respondents need additional knowledge on assessing the clinical manifestation of severe pre-eclampsia.

#### Compliance with ethical standards

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*Disclosure of conflict of interest*

No conflict of interest to be disclosed.

*Statement of informed consent*

Authors stating that “Informed consent was obtained from all the individual participants included in the study.

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