KNOWLEDGE, ATTITUDE AND PRACTICE OF PRIMARY HEALTH CARE DOCTORS AND NURSES IN HYPERTENSION OF PREGNANCY

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**HEF the study: To determine the knowledge, attitude, and practice of doctors and nurses in the Middle East in the prevention of hypertension during pregnancy.

**METHODS:** A cross-sectional, descriptive study was conducted among primary health care doctors and nurses in Saudi Arabia. The study sample consisted of 150 doctors and nurses from various health centers in Jeddah. The data were collected using a self-administered questionnaire. The questionnaire included questions about their knowledge of hypertension during pregnancy, their attitude towards its prevention, and their practice regarding its management.

**RESULTS:** The results showed that 60% of the doctors and nurses had a good knowledge of hypertension during pregnancy. However, only 30% of them felt confident in their ability to prevent it. The majority of them (90%) agreed that hypertension during pregnancy is a serious health problem. The most common practice was to refer patients with hypertension to specialists (85%).

**CONCLUSIONS:** There is a need for improving the knowledge and practice of doctors and nurses in the prevention of hypertension during pregnancy. Further studies are needed to develop effective strategies to address this issue.

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Doctors & Nurses KAP in Hypertension of Pregnancy 35
Objective: To assess the status of knowledge, attitude and practice (KAP) of doctors and nurses in Primary Health Care (PHC) centers with regard to hypertension in pregnancy and to identify factors associated with KAP in Al-Khobar, Saudi Arabia.

Methodology: Using a self-administered comprehensive questionnaire, all available doctors and nurses in PHC centers of the Al-Khobar area were approached to determine their knowledge, attitude and practice in hypertension during pregnancy. Questionnaires were validated and pilot tested. Each section of the questionnaire was scored and the mean scores calculated. Factors affecting each section were identified by means of multiple regression analysis.

Results: A total of 36 doctors and 91 nurses were enrolled in the study. Saudis formed 22.2% of the doctors and 47.3% of nurses. Mean years of practice after graduation were 12.6 and 8.7 years for doctors and nurses, respectively. Saudi nurses spend only 3 weeks in the obstetrics ward during the whole period of their internship. All Saudi nurses hold only diplomas and not many courses on the hypertensive disorder are offered to both doctors and nurses after graduation. The practice of doctors particularly in the management of patients after reaching a diagnosis and educating them on diet and salt intake was poor. Furthermore, their knowledge was also poor. Though their level of knowledge was poor, the nurses’ practice was satisfactory, particularly in taking history and physical examination. The attitude of both doctors and nurses towards hypertensive disorders was in general, positive and satisfactory towards health education. Nurses’ nationality and duration of post-internship training were the factors that influenced their attitude and scores on knowledge.

Conclusion and recommendation: The study revealed that both doctors and nurses working in the PHC lacked training and knowledge in this area of their work. It is therefore necessary to give PHC doctors and nurses refresher courses on common and serious problems like hypertension. A longer period of training in action management is needed to improve the knowledge and practice of doctors and nurses working in antenatal clinics in this area.

Key Words: Pregnancy hypertension, knowledge and practice, Antenatal care, Primary Health Care.

INTRODUCTION
Hypertension is one of the most common if not the commonest medical complication in pregnancy.\textsuperscript{1-9} Hypertensive disorders in pregnancy are found to be the greatest single cause of maternal mortality.\textsuperscript{10,11} It also causes a lot of prenatal mortality.\textsuperscript{12} Most of the complications caused by this problem could be reduced by early detection and proper management.\textsuperscript{13,14} Studies on the incidence of hypertensive disease in pregnancy in most developing countries, including Saudi Arabia, are scarce.\textsuperscript{15} Few of those studies, if any, have looked at the extent of knowledge, attitude or practice of doctors or nurses dealing with hypertensive pregnant mothers. Hence, the objective of this study was to determine the status of knowledge, attitude and practice (KAP) of doctors and nurses in PHC centers with regard to hypertension in pregnancy and to analyze factors affecting KAP in the Al-Khobar area of the Eastern Province of the Kingdom of
Saudi Arabia. Terms used to describe hypertension and its complications in pregnancy differ according to its presentation, gestational age of discovery and the presence of previous history of hypertension before pregnancy. The one defined by the 1972 Committee on Terminology of the American Obstetricians and Gynecologists (ACOG)\textsuperscript{13,15-19} was adopted for the purpose of this KAP study.

**METHODOLOGY**

Doctors and female nurses working at all 8 PHC centers in Al-Khobar area were enrolled for the study. Two self-administered questionnaires structured to examine the essential knowledge, attitude, and practice of doctors and nurses in dealing with hypertensive disorders during pregnancy. Each questionnaire was divided into two parts. The first was intended to gather demographic characteristics and information on the respondent that might affect the KAP. These variables included age, sex, nationality, year of graduation, certification, training and experience in obstetrics, duration of work in PHC in the country and any in-service training received. The second part of the questionnaire consisted of 49 questions divided into three sections dealing with practice, attitude and knowledge. The practice sections included questions designed to test competence of doctors and nurses in the skills of measuring blood pressure, management of the hypertensive pregnant mother and practices of health education. The knowledge section was composed of 28 questions to test basic medical knowledge regarding blood pressure reading, management of the problem and its complications. Both questionnaires were given to three consultant obstetricians and two nurse educators for consent validity and elimination of non-essential questions. Both knowledge and practice areas were scored on a zero and one additive scoring system in which each correct answer or practice was given one score and no mark given for a wrong response. The attitude part included questions that measured attitudes of participants towards the seriousness and commonness of hypertension in pregnancy and their motivation to improve their knowledge on the subject. Attitude questions were scored using the Five-Point Likert scaling system. In this scale, a high attitude was assigned to the answer if the respondent’s answer was to “agree” or “strongly agree” to the question in the scale and a low attitude level for “Not Sure” or “Disagree”. Final scoring of the knowledge and practice section was satisfactory if the participant scored at least 60% of the total marks in these two sections. This was an arbitrary cut-off point based on the pilot study and judgment of the experts. On attitude, the questionnaire was handed over to five postgraduate doctors in general practice and their responses to attitude questions were used as a reference standard. The questionnaire for nurses was translated into Arabic for the Arabic-speaking nurses to make them clearer. Both versions of the questionnaire were pilot tested on a pilot group of 10 doctors and 22 nurses, selected randomly from PHC centers in a nearby city, Al-Dammam to assess level of difficulty, clarity, suitability and time required for their completion. Modifications and deletions based on the findings of the pilot study were subsequently made. Data were fed into a personal computer, cleaned and analyzed using EPI info and SPSS statistical packages. Frequency distribution tables were constructed and appropriate tests including the multiple regression analysis to identify significant independent factors were applied. The level of significance was considered at p-value of <0.05.
RESULTS

The total number of PHC doctors in Al-Khobar area was 44. Among those 36 (81.4%) who were present at time of data collection were enrolled in the study. Their ages ranged between 25-47 with mean of 37.1 years (SD ± 6.4) and 56% were in the 35-44 years group. Males constituted 58.3% of the doctors. Arab nationals other than Saudis including Egyptians, Palestinian, and Jordanian formed the majority of doctors (41.7%), while Saudis constituted 22.2% of the group and the rest were from the Indian subcontinent. The mean number of years in practice after graduation was 12.6 years (SD ± 7.38). Table 1 describes distribution according to number of years after graduation.

Table 1: Distribution of PHC doctors according to years of practice after graduation

| Years of practice | Frequency | Percentage |
|-------------------|-----------|------------|
| 1-4               | 6         | 16.7       |
| 5-9               | 6         | 16.7       |
| 10-14             | 11        | 30.7       |
| 15-19             | 7         | 19.5       |
| 20-24             | 3         | 8.4        |
| 25-29             | 3         | 8.4        |
| **Total**         | **36**    | **100**    |

The mean number of years working in PHC was 4.7 years (SD ± 3.4) and 17 doctors (47.2%) had worked for over 5 years in PHC centers. Only, 4 doctors (11.1%) had postgraduate qualifications; out of these only one held a diploma in Obstetrics. Five doctors (13.9%) had had 3-6 months post-internship training in Obstetrics but no certification. Of the entire group, only 2 doctors (5.6%) had had courses in hypertensive disorders in pregnancy in the course of their work.

In describing their general attitude towards managing hypertension in pregnancy, a majority of doctors (80%) stated clearly that they did not feel confident in managing hypertensive pregnant mothers and would prefer to see children or adult male patients in their clinic. Nevertheless, the attitude of 34 doctors (94.4%) toward learning more about hypertension in pregnancy was positive. Out of the maximum attitude score of 45 marks, the mean score for the attitude questions for the group reached a reasonably high figure of 30.69 marks. Table 2 describes some of the attitude questions and their responses.

Table 2: Doctors attitudes towards hypertension in pregnancy

| Statements                                           | +ve (%) | -ve (%) |
|------------------------------------------------------|---------|---------|
| Hypertension in pregnancy is a common problem.       | 25 (69.4) | 11 (30.6) |
| Measurement of blood pressure for every pregnant mother in each ANC visit is mandatory. | 35 (97.2) | 1 (2.8) |
| I need to know more about hypertension in pregnancy. | 34 (94.4) | 2 (3.6) |
| I believe, I can manage some patients with preeclampsia in my clinic. | 17 (47.2) | 19 (53.8) |

Doctors’ management of hypertension in pregnancy was quite deficient as 16 doctors (44.4%) reported that they had not actually seen any hypertensive pregnant mother during last year. Around 53% of the doctors depended on BP measurement taken by a competent staff and did not check it. The doctors’ scores for practice was generally low, as only 60% of them got the correct answers to the skill of blood pressure measurement, a basic skill necessary for any medical graduate. In addition, almost all doctors wrongly reported that they had advised their pregnant hypertensive patients to lose weight and reduce their salt intake. Another major mistake noted among 25% of the doctors was that they said they would start treatment of hypertensive cases immediately.
after diagnosis in their clinic without considering referral. The scores on practice of 75% of the doctors were below the satisfactory cut-off point.

Again the doctors’ score of 58.3% on all areas of knowledge was unsatisfactory since this directly affected the diagnosis and quality of care for hypertensive mothers. Some of the responses dealt with normal and abnormal readings of blood pressure and the presenting symptoms of preeclampsia. Doctors’ mean score 12.1 marks out of a total score of 21 on knowledge was moderate.

The total number of PHC nurses in Al-Khobar area was 120. Among these, the 91 (75.8%) who were present at the time of data collection answered the questionnaire. Their mean age was 29.8 years (SD ± 6.3) ranging between 20-44 years, 74% of them fell within the 20-34 age group. Saudis constituted 47.3 of all nurses. Indians formed the second largest group (37.4%) followed by Filipinos (11%). According to their qualification, 14 nurses (15.4%) held Bachelor degrees and 77 (84.6%) had diplomas. All the Saudi nurses belonged to the latter group. Mean years of practice after registration was 8.7 (SD ± 5.4) and their distribution is shown in Table 3. Mean duration of work in PHC was 4.1 years (SD ± 2.8) and most nurses (69.2%) had spent < 5 years working in PHC in the country.

Table 3: Distribution of PHC nurses according to years of practice after registration

| Years of practice | Frequency | Percentage |
|-------------------|-----------|------------|
| 1-5               | 30        | 33         |
| 6-10              | 25        | 27.5       |
| 11-15             | 25        | 27.5       |
| 16-20             | 9         | 9.9        |
| > 20              | 2         | 9.9        |

Thirty-seven nurses (40.7%) had spent < 6 months in Obstetrics training and 10 nurses (11%) had spent > 1 year. Most of the group (48.3%), mainly the Saudis, had minimal training of 3 weeks in obstetrics ward during their internship period as required by the Saudi female health institution.

A majority of the nurses – 73 (80.2%) had not worked in a PHC setting before their current positions. Out of those who had had previous PHC experience, only 13 had had any experience in antenatal care. None of them had had courses in hypertensive disorders in pregnancy during their work in PHC.

Table 4: Nurses attitude towards hypertension in pregnancy

| Statements                                                                 | +ve (%) | -ve (%) |
|---------------------------------------------------------------------------|---------|---------|
| Taking of blood pressure for almost every pregnant woman during each antenatal care visit is mandatory. | 90 (89.9) | 1 (1.1) |
| I should educate pregnant women about hypertension in pregnancy.         | 90 (98.9) | 1 (1.1) |
| I should educate pregnant women about the importance of early antenatal care. | 91 (100) | 0       |
| I should educate pregnant hypertensive patients about the need for bed rest. | 89 (97.8) | 2 (2.2) |
| Hypertension in pregnancy is a common health problem.                     | 78 (85.7) | 13 (14.3) |
| I need to know more about hypertension in pregnancy.                     | 91 (100) | 0       |

In describing their general attitude towards hypertension in pregnancy, 86% of them reported that it was a common health problem and they were all positive about learning more. They were all keen to talk to pregnant women about their problem and advice them to take bed rest. Out of the maximum attitude score of 35 marks, the highest mean score was 30.02 marks. Table 4 shows some of the attitude questions and their responses.
The nurses were quite good on practice in the area of hypertension in pregnancy, as 95.6% of them scored “Satisfactory”. Most of the questions related to the skill of measuring blood pressure. Questions on management were answered correctly by 86.1 and 9.7% of them. The mean score of this section on practice was quite high for nurses being 8.3 marks out of a total score of 12 marks.

The nurses’ level of knowledge was very low since only five of them (5.5%) scored “Satisfactory” on the questions in this section. The deficiencies were in areas dealing with diagnosis and quality of care for hypertensive mothers. The questions included simple definitions and associated symptoms of high blood pressure. Most of them (96.7%) wrongly considered salt restriction and weight reduction as important in the health education of hypertensive pregnant women. Mean scores on knowledge was 9.02 marks out of a total score of 20 marks which was quite low.

In the regression analysis of independent factors associated with KAP of doctors and nurses, all variables in the first part of the questionnaire such as age, nationality and certification were included in a series of multiple regression equations against each of the dependent variables, namely, scores on knowledge, attitude, and practice for doctors and nurses. There was a positive significant association of the doctors’ attitude with their sex i.e., male, nationality, being older and previous enrollment in a course on hypertension (R square = 0.26 p=0.02). Their knowledge was only associated with previous training in Obstetrics (R square = 0.14, p=0.02), while practices of both doctors and nurses were not associated with any of the factors under study. The attitude of nurses, on the other hand, showed different associations as non-Saudi nationals and training in Obstetrics had a positive significant effect on their attitude (R square = 0.08, p=0.02). Their knowledge was only associated significantly with being non-Saudi (R square = 0.19, p=0.001).

DISCUSSION
Hypertension in pregnancy is one of the major causes of prenatal morbidity and mortality. It is responsible for about 18% of maternal mortality. Maternal mortality in hypertensive disorders of pregnancy is primarily due to low standard of care and delay in referral. Antenatal care (ANC) is a major part of maternal and child services in PHC. One of the most important functions of ANC is to detect high-risk pregnancies and to give them the necessary care. Early detection of hypertension in pregnancy is vital to its management. Findings from this study will help to identify the status KAP of workers in PHC on hypertensive disorders in pregnancy.

It was discovered in this study that the definition of raised blood pressure and its management was not standardized among doctors and nurses in PHC. This is not surprising as previous study by Bisson in Bristol in which a large group of general practitioners, hospital doctors, hospital midwives, community midwives and student midwives who were questioned, gave variety of action plans according to their understanding of diagnostic criteria. They considered the reading of 90 mmHg the model value of diastolic BP at which further action would be taken, whether proteinuria was present or absent. Edema was considered a useful indicator by 93% of the respondents and 49% would use ankle edema in their assessment. Another questionnaire-based survey by Hutton on the management of hypertension in pregnancy completed by 65 New Zealand Obstetricians found that 40 (61.5%) doctors considered the diastolic of 80-85 mmHg, the lowest abnormal reading, at 28 weeks, and by 18 (27.7%) doctors at 36-
week gestation. However, 20 (30.8%) doctors considered the diastolic of 90 mmHg, at 28 weeks and 42 (64.6%) doctors at 36 weeks gestation, the lowest abnormal reading.

Around 47% of PHC doctors had spent more than 5 years in PHC service in KSA and only 14% of them had had post-internship training in Obstetrics but being males had not been involved in ANC activity in PHC. Only 2 had had courses in hypertensive disorders of pregnancy. This clearly points to a dearth of training courses in PHC.

About 44% of the doctors had not seen any cases of hypertensive pregnant mothers during the last year. Questions asked were concerned with four aspects namely, techniques of blood pressure measurements, history and physical examination, health education practice and action management to be taken by the PHC doctors on discovered cases. The practice of 75% of doctors was unsatisfactory in all these areas. Nevertheless, better scores were achieved in techniques of blood pressure measurement. This was considered a basic skill routinely used by doctors in their clinics. It is obvious that having such little contact with hypertensive cases and lacking the basic training or refresher courses, their management skills will be inadequate.

Since hypertension is one of the commonest medical complications in pregnancy, it is important to educate the pregnant mother about it. Almost all doctors report that they advise hypertensive mothers on the need for bed rest. This is an important non-pharmacological measure in the management of the problem. On the other hand, almost all doctors report that they advise their patients to restrict their salt intake and to go on a weight-reducing diet. This is wrong practice, which is unfortunately quite common. Salt restriction in hypertensive non-pregnant women can be effective but in pregnancy may aggravate the condition. Moreover, diet restriction in pregnancy can lead to delivery of small-for-date fetus. Similar findings of wrong advice were reported in other studies by Trudinger and Bisson.

Around 85% of PHC doctors reported that they would not refer hypertensive cases after diagnosis and 25% of them would start medication immediately after diagnosis. This is unacceptable by PHC standards. In fact, the cornerstone of management of hypertensive cases starts in the PHC center with accurate diagnosis and undelayed referral of these cases from the PHC to the specialist or hospital. PHC doctors should be aware of their limitation in the management of these cases and not to jeopardize the health of the mother and her fetus.

The responses of PHC doctors to the questions on attitude were variable. Around 31% did not recognize this is a common health problem in pregnancy, while 97% of them stressed the importance of taking blood pressure reading at each ANC visit. That 53% of PHC doctors depended on blood pressure measurement taken by clinical staff without confirming it, the reading themselves is an alarming negative attitude as well as wrong practice. The diagnosis of hypertension in general or in pregnancy in any patient is not an easy task and proper management and modifications depend on it. It is therefore, important that the person responsible for the management, namely, the doctor, should confirm the reading again.

In looking for factors affecting the attitude of doctors, it was found that gender i.e., male, Arab, older and previous training in a course on hypertension were factors associated with higher scores. Longer experience in PHC work, being male and older and the absence of a language barrier for Arabic speakers,
including Saudis, might explain to some extent their better attitude scores as compared to those of the females and younger doctors.

The knowledge of about 58% of doctors on questions that bare on the diagnosis and quality of care of hypertensive mothers as well as the definition of high blood pressure and associated symptoms was unsatisfactory. This clearly indicates the importance of continuing medical education.

Nurses provide most of the vital ANC services in the PHC. Around 53% of the PHC nurses were non-Saudis and non-Arabic speakers and the language barrier adversely affects the health education in hypertensive cases. It is obvious from the results that there is a shortage of specialized courses for nurses. None of the Saudi nurses had more than a diploma in nursing and there didn’t seem to be any arrangements for their further movement at Universities. A period of 3 weeks in an obstetrics ward for new graduate nurses as part of an internship period is not enough to give clear, pragmatic information on ANC services in a PHC setting. About 31% of the nurses have spent > 5 years in the PHC centers in the KSA, but only 10% had taken courses in hypertension. This clearly, demonstrates the necessity of a better arrangement for on-job training classes for them.

Nearly 96% of the nurses scored “satisfactory” in the practice section. Their responses to the question of history and physical examinations were 87% correct and about 90% of them responded correctly to the questions on health education. Their erroneous responses were on the items on restriction on salt intake and weight reduction. These good scores indicate that except for their wrong ideas on salt and diet restriction, which should be corrected at refresher courses, the correct procedure have been learnt.

Although the PHC nurses were very good with practice in general, around 95% of them had poor knowledge. Practice leads to the perfection of psychomotor skills. Knowledge and facts, on the other hand, need to be updated by continuous education.

Their general attitude, towards hypertensive disorders in pregnancy was positive. Around 86% of them felt that it was a common health problem and reported that they needed to know more about it. They were all interested in spending time to inform hypertensive cases on their disease. The importance of a Health Education as a vital task for nurses cannot be ignored. The presence of these cases in the clinic, therefore, provides a good opportunity for the performance of this task. The nurses’ positive attitude is indicative of their high motivation for self-improvement.

There was a strong positive association of attitude of nurses to non-Saudi nationality and training in obstetrics. Knowledge scores were also significantly associated with being non-Saudi. These findings can be related to the difference in educational level. While all Saudi nurses hold Diplomas, about 30% of the non-Saudi nurses have Bachelors degrees. There is a masked difference in the type, duration and content of curriculum at the pre-graduate level for both groups and non-Saudi nurses had higher knowledge scores than Saudis. The implication of these findings clearly points out the need to improve the knowledge and attitude of PHC nurses through refresher courses.

CONCLUSION AND RECOMMENDATIONS

In conclusion, PHC doctors had scored “Good” in attitude questions but had low scores on the practice and knowledge component of the questionnaire. The nurses scored high on practice and attitude but had low scores on the knowledge component. It is
recommended that appropriate regular refresher courses on common and serious problems like hypertension be organized for doctors and nurses in the PHCs. There should be opportunities for effective training of reasonable duration with clearly defined objectives under proper supervision in good hospitals to improve their knowledge and practice. It would be also appropriate to offer Saudi doctors extra incentives for postgraduate study in family medicine to deal with these common problems, and to institute a suitable program of continuing medical education within the health centers for both doctors and nurses. It is also vital to review the curriculum of the female nursing institutions to update both its theoretical and practical content, and extend the duration of training in such common problems as hypertension in obstetrics.

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