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The prevalence of preeclampsia and eclampsia among pregnant women and its association with socio-demographic and anthropometric factors at hospital Tengku Ampuan Afzan, Kuantan Pahang

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ABSTRACT

Background: The main causes of maternal morbidity and mortality are preeclampsia and eclampsia. It is becoming the main public health issue nowadays. Preeclampsia and eclampsia can be affected by many factors. **Objective:** In this study, the researcher intended to explore the prevalence of preeclampsia and eclampsia in hospital Tengku Ampuan Afzan, Kuantan Pahang. As well as the researcher also intended to identify the main factors that can increase the occurrence of preeclampsia and eclampsia among pregnant women. For this study, the association factors are the socio-demographic and anthropometric factors of pregnant women who had given birth at Hospital Tengku Ampuan Afzan. **Methods:** A retrospective cohort study was conducted in Hospital Tengku Ampuan Afzan, Kuantan. A total of 380 pregnant women who had given birth at the Hospital Tengku Ampuan Afzan were included in this study. The patient record has been explored to get information and data about pregnant women, which is the National Obstetrics Registry database (NOR). From all the pregnant women during the study period, the researcher classified these pregnant women into those who had preeclampsia and did not have preeclampsia. Next, the demographic and anthropometrics data about the pregnant women who had given birth in Hospital Tengku Ampuan Afzan were collected from the patient record. Their association with preeclampsia and eclampsia was studied. **Results:** It was found that the prevalence of preeclampsia among pregnant women who had given birth at HTAA during the study period was 2.6%, while no patient got eclampsia. This study also showed an association between maternal age and preeclampsia; the p-value was less than 0.001. There was also an association between the body mass index (BMI) and preeclampsia; the p-value was 0.004, which is less than 0.05. **Conclusion:** The prevalence of preeclampsia in HTAA was lower than in other studies. Various factors can increase the risk of getting pre-eclampsia, such as older maternal age and obesity

INTRODUCTION

Pre-eclampsia and eclampsia are hypertension disorders in pregnancy that occur among pregnant women. These are the common complications that usually happen among pregnant women during the pregnancy. Pre-eclampsia can be characterized by high blood pressure and a high protein level in the urine (Jim, Sharma, Kebede, & Acharya, 2010). It also can be characterised by sudden blood pressure spiking in pregnant women after the 20th week of the pregnancy. It means that before week 20 of the pregnancy, the pregnant woman's blood pressure is in the normal range, which is 120/80mmHg. After the 20th week of gestation, their blood pressure becomes persistently elevated blood pressure with a systolic blood pressure of 140 mmHg or greater and diastolic blood pressure of 90 mmHg or higher field (Singh, 2009). Pre-eclampsia can lead to eclampsia. Eclampsia is a serious condition that puts the mother and fetus at high risk during pregnancy. In 2013, it was stated that approximately 289000 women died globally from pregnancy-related causes (Tessema, Tekeste, & Ayele, 2015). One of the complications that usually pregnant women will get during pregnancy is hypertension disorder, including pre-eclampsia and eclampsia. It is one of the leading public health issues worldwide nowadays. Moreover, pre-eclampsia and eclampsia were found to be the causes of maternal and perinatal mortality and morbidity among hypertension disorder in pregnant women field (Organization, 2011). In Malaysia, the total of pregnant women that got hypertension in pregnancy is about 5212 and 1022 of them got pre-eclampsia, whereas 72 of them got eclampsia (Jeganathan et al., 2009). These preeclampsia and eclampsia are also becoming the leading causes of maternal mortality in Malaysia. In Malaysia, one study mentioned that chronic hypertension causes approximately 30% of hypertensive disorders of pregnancy, and 70% of cases are diagnosed as gestational hypertension and preeclampsia (Fatemeh, Marziyeh, Nayereh, Anahita, & Samira, 2010). Many studies revealed maternal age can increase the risk of getting pre-eclampsia and eclampsia among pregnant women. A study in Latin America showed that the mean (standard deviation) age was 26.3 (7.2) years in women with pre-eclampsia and 25.3 (6.4) in women with normal pregnancies (Conde-Agudelo & Belizán, 2000). Most of the pregnant women that maternal age $\geq$ 35 years old have a higher risk of pre-eclampsia and eclampsia. About 32.3% of pregnant mother aged over 30 years who gave birth in Imam Khomeini Hospital (IKH), Tehran, was reported to have pre-eclampsia (Khosravi, Dabiran, Lotfi, & Asnavandy, 2014). On the other hand, the body mass index (BMI) of pregnant women also increases the risk of developing pre-eclampsia and eclampsia during the pregnancy period. A recent retrospective cohort study of 850,000 women reported that compared with control women of normal BMI, obesity was more strongly associated with pre-eclampsia occurring at 34 weeks of gestation or beyond than pre-eclampsia before 34 weeks of gestation (Anderson et al., 2012). As well as the study of Latin American and Caribbean women found that pre-pregnancy BMI was strongly associated with the risk of pre-eclampsia (Conde-Agudelo & Belizán, 2000). In this study, the researcher intended to explore the prevalence of preeclampsia and eclampsia at HTAA. As well as the researcher also intended to identify the main factors that can increase the occurrence of preeclampsia and eclampsia among pregnant women.

METHODS

This study used the retrospective study by reviewing the patient's record or data to know the prevalence of pre-eclampsia and eclampsia and its association with maternal age and body mass index (BMI). This retrospective record review was conducted at Hospital Tengku Ampuan Afzan Kuantan, Pahang. The data or

records about the pregnant women who had given birth in the Hospital Tengku Ampuan Afzan (HTAA) have been investigated in this study. All the data were collected from the patient record file in the Nursing Obstetrics Registry (NOR). The Nursing Obstetrics Registry (NOR) is a clinical "disease" database that compiles obstetric data. The study's sample size was taken from the first 380 patients who had given birth in HTAA during the study period.

Data Collection

A collection of data took place after gaining approval from Kulliyyah of the Nursing Research Committee (KNRC), IIUM Research & Ethical Committee (IREC), National Medical Research Register (NMRR) and Medical Research and Ethics Committee (MREC). In addition, approval from the Head of the Obstetrics and Gynaecology Department also was gained before the data were collected. Only the patient's diagnosis, socio-demographic data, and anthropometric data were included in this study. This information about the participant had been kept in stringent confidentiality and anonymity. Moreover, the data obtained in the research study was only used for the research study. The collected data was not used for the genetic analysis. This study was only for knowledge purposes, and the patient's privacy and dignity were protected from future research. The identity of the respondent will be kept anonymous in this study. No part of it will be sold to, or re-used by, people for other research or non-research purposes. All the data were kept in the Research Community room (under lock and key) and will be destroyed after three years of study.

Eligible criteria

Inclusion criteria were a set of conditions that must be met by a sample to be valid for the study. In contrast, exclusion criteria were the standards that render a sample to be invalid to be included in the sample population. The data retrospectively examines all pregnant women who had given birth at HTAA.

Instruments

The instrument used in this study was Nursing Obstetrics Registry (NOR) database. All the patient records and data were collected and viewed from this database.

RESULT

Socio-demographic data

The socio-demographic data includes age, height, and body mass index (BMI). Most respondents involved in this study were pregnant women under age 35 and 336 pregnant women (88.4%). On the other hand, pregnant women in a category more than or equal age 35 years old accounted for 44 pregnant women (11.6%) of the sample. The mean for the weight of the pregnant women who were involved in this study is 60.13kg (SD=14.21), while the mean for the height of the pregnant women who participated in this study is 1.55m (SD=0.055). Body mass index (BMI) was classified into underweight, average weight, overweight, and obese. Out of 380 respondents involved in this study, 34 of them were underweight, 177 of them were normal weight, 102 of them were overweight, and 67 of them were obese. Most pregnant women in this study were of average weight, accounting for 46.6% of them (Table 1).

Table (1): Descriptive Data for Socio-demographic of Pregnant women who gave birth at HTAA

Items	Mean (SD)	*f* (%)
Age		
Less than 35	-	336 (88.4)
More than or equal 35	-	44 (11.6)
Weight (kg)	60.13(14.21)	-
Height (m)	1.55(0.055)	-
Body mass index (BMI)		
Underweight (< 18.5)	-	34 (8.9)
Normal (18.5-24.9)	-	177 (46.6)
Overweight (25.0-29.9)	-	102 (26.8)
Obese (> 30.0)	-	67 (17.6)

Prevalence of preeclampsia and eclampsia

Descriptive analysis was used to determine the frequency and the percentage of pregnant women diagnosed with pre-eclampsia and eclampsia. Based on Table 2, of the total 380 participants involved in this study, only 10 pregnant women had been diagnosed with pre-eclampsia, and there was none of them had been diagnosed with eclampsia. It accounted for 2.6% of the total number of pregnant women who had given birth. Another 97.4% of them were not diagnosed with pre-eclampsia or eclampsia. So, the prevalence of pre-eclampsia among pregnant women who had given birth during the study period was 2.6%.

Table (2): Prevalence of pre-eclampsia among pregnant women who had given birth at HTAA

Diagnosis	*f*	%
Pre-eclampsia		
Yes	10	2.6
No	370	97.4
Total	380	100

Association between maternal age with pre-eclampsia

The second research objective is about the association between maternal age and the prevalence of pre-eclampsia. This study classified the maternal age into two categories: the maternal age less than 35 years old and the maternal age more than or equal to 35 years old. These two variables are the categorical data: pre-eclampsia and maternal age. About that, the test used was the Chi-square test was used to determine the association between maternal age and the prevalence of pre-eclampsia. Table 3 shows the association between maternal age and the prevalence of pre-eclampsia. By using the Chi-square test, the p-value was less than 0.001. Hence, we reject the null hypothesis because there was a significant difference between maternal age and the prevalence of pre-eclampsia since the p-value was less than 0.001.

Table (3): Association between maternal age and prevalence of pre-eclampsia among pregnant women who had given birth at HTAA.

Variable	n	Age < 35 years old (%)	Age ≥ 35 years old (%)	X^2 statistics (df)	*P value
Pre-eclampsia					
Yes	10	5(50.0)	5(50.0)	14.808 (1)	< 0.001
No	370	331(89.5)	39(10.5)		

Association between body mass index (BMI) with pre-eclampsia

The third research objective is about the association between the Body Mass Index (BMI) and the prevalence of pre-eclampsia. For this research, the Body Mass Index (BMI) were categorised into four different categories according to the level of BMI. The four categories were underweighted, which is a BMI of less than 18.5; average weight, which is a BMI of around 18.5 to 24.9; which is a BMI of 25 to 29.9; and obese, which is a BMI more than or equal to 30. Table 4 shows the association between the body mass index (BMI) and the prevalence of pre-eclampsia. By using the Chi-square test, the p-value was 0.004. Hence, we reject the null hypothesis due to there being an association between the body mass index (BMI) and the prevalence of pre-eclampsia since the p-value is less than 0.05.

Table (4): Association between body mass index (BMI) and prevalence of pre-eclampsia among pregnant women who had given birth at HTAA.

Variable	n	Underweight (<18.5)	Normal (18.5-24.9)	Overweight (25-29.9)	Obese (≥30)	X^2 statistics (df)	*P value
Pre-eclampsia							
Yes	10	0(0.0)	3(30.0)	1(10.0)	6(60.0)	13.067(3)	0.004
No	370	34(9.2)	174(47)	101(27.3)	61(16.5)		

DISCUSSION

In Malaysia, pregnant women with hypertensive disorder of pregnancy (HDP), which include pre-eclampsia and eclampsia, accounted for 3.0% of admissions to public hospitals in the year 2006 (Norhayati, Nik Hazlina, Sulaiman, & Azman, 2016). Another study done in Kelantan, Malaysia, found that almost 7-10% of total pregnancies had a hypertensive disorder of pregnancy (Singh, 2009). This study showed that the prevalence of pre-eclampsia (2.6%) was much lower when compared with the prevalence of pre-eclampsia in Malaysia in the year 2006, which accounted for 3.0%. Based on one of the studies done in Algeria, about 8% of pregnant women got pre-eclampsia when the study about the prevalence of pre-eclampsia was conducted in the field (Kichou, Henine, Kichou, & Benbouabdellah 2015). It shows that this study had a higher prevalence rate of pre-eclampsia than ours. This difference might be due to a larger sample size that had been used for their study, which is 3225, compared to our study's only 380 sample size. In addition, one of the previous studies conducted at the University of Calabar Teaching Hospital discovered that among 8524 total deliveries from 2009 until 2011, 104 of them had pre-eclampsia (Kooffreh, Ekott & Ekpoudom, 2014). It shows that the prevalence of pre-eclampsia among pregnant women was 1.2%, slightly lower than this study, which accounted for 2.6%. It means that the prevalence of pre-eclampsia in HTAA was slightly high when compared with the prevalence of pre-eclampsia in the University of Calabar Teaching Hospital. This prevalence is very important to know because it can alert the nation that pre-eclampsia is still one of the complications that might happen to pregnant women and one of the causes of maternal mortality. By knowing this disease affects our society, the health sector and the individual can take early precautions and prevention to prevent our society from getting pre-eclampsia during pregnancy. Next, the association between maternal age with pre-eclampsia also had been investigated. Since the result of the p-value is less than 0.001 when using the Chi-square test, it was concluded that there was an association between maternal age with the prevalence of pre-eclampsia. The study discovered that the socio-demographic factor of maternal age was significant in the prevalence of pre-eclampsia. This study is similar to the study done in Finland, which stated an association between maternal age and pre-eclampsia (Lamminpää, Vehviläinen-

Julkunen, Gissler, & Heinonen, 2012). Moreover, the study from the United States also found an association between childbearing age and pre-eclampsia (Jeyabalan, 2013). In addition, a study found that the incidence rate for pregnant women aged 30 and above who got pre-eclampsia was 96.4% (Kahnamouei-aghdam, Amani, & Hamidimoghaddam, 2015). So, it can be concluded that this study's finding was like the previous studies that found that maternal age was significantly related to pre-eclampsia.

The association between body mass index (BMI) with pre-eclampsia also was determined in this study. The result of this study shows that the p-value was less than 0.05; it was concluded that there was an association between body mass index (BMI) with the prevalence of pre-eclampsia. Of ten pregnant women who had pre-eclampsia in this study, 3 (30%) of them were in normal weight, 1 (10%) was overweight, and 6 (60%) of them were obese. It shows that most pregnant women who got pre-eclampsia were obese mothers which a BMI of over 30. This result is similar to the study conducted in Brazil, which found that the risk of pre-eclampsia is increased with body mass index (BMI)(Dantas et al., 2013). Moreover, the findings from one of the previous studies also indicated that being overweight or obese was associated with higher odds of preeclampsia (Lewis et al., 2014). One of the studies in Malaysia stated that excessive weight during pregnancy might herald the onset of preeclampsia (Weber et al., 2014). It shows similarities between this study and the study done in Malaysia. Increased body weight is a potentially modifiable risk factor in getting pre-eclampsia among pregnant women. One of the ways controlling weight could help reduce the risk of maternal complications, which is preeclampsia. Pregnant women should control or reduce their BMI to the normal range so that the risk of getting pre-eclampsia will decrease. One of the studies found that low BMI in pregnant women was significantly less likely to develop gestational hypertension or pre-eclampsia (Belogolovkin et al., 2007).

CONCLUSION

Based on the findings from this study entitled "The Prevalence of Preeclampsia among Pregnant Women and Its Association with Socio-Demographic and Anthropometric Factors at Hospital Tengku Ampuan Afzan, Kuantan, Pahang", several things can be concluded. The prevalence of pre-eclampsia in Hospital Tengku Ampuan Afzan was lower than in other similar studies. It also can be concluded that having older maternal age and a higher body mass index (BMI), which is obese, were factors associated with pre-eclampsia. Knowing this, all pregnant women should take prevention from getting pre-eclampsia, like having a good lifestyle which is maintaining the body mass index (BMI) in the normal range and preventing getting pregnant at an older age which will increase the risk of getting pre-eclampsia.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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