Knowledge of Preeclampsia and Risk Factors among Pregnant Women Attending Antenatal Care at Kampala International University Teaching Hospital, Bushenyi District.

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ABSTRACT

This study aimed to determine the knowledge of Preeclampsia (PE) among pregnant women attending Antenatal care at Kampala International University-Teaching Hospital (KIU – TH). Epi info version 7 was used to code and enter data, and the data was exported into SPSS version 22.0 for analysis. Univariate and multivariate logistic regression analyses were performed to determine factors associated with adequate PE knowledge. Variables with a p-value of < 0.2 during a univariate analysis were incorporated into a multivariate logistic regression model to control for confounding. Hosmer and Lemeshow's test was used to test the goodness-of-fit of the final logistic regression model. The majority of pregnant women were married (81.6%), unemployed (78.4%), residing in a rural setting (69.4%), having attained a primary education (64.7%), and not aware of any family history of preeclampsia. The majority had inadequate knowledge about PE (89.4%), while 10.6% had adequate knowledge. Age above 35 years, having an education above primary level, and having a parity of >2 were significantly associated with adequate knowledge in a univariate logistic regression model. Having a primary education, having more than one pregnancy, and having experienced PE before were independently associated with adequate PE knowledge in the multivariate logistic regression model.

Keywords: Pregnant woman, Antenatal care, Preeclampsia, Potential confounders, Primary education.

INTRODUCTION

Pre-eclampsia is a pregnancy-specific systemic disorder affecting up to 2-7% of all pregnancies and it contributes to maternal and fetal morbidity and mortality globally [1]. Preeclampsia is one of the leading causes of maternal and fetal mortality worldwide and a main cause of preterm labour. Women with a history of preeclampsia are at elevated risk for cardiovascular diseases later in life [1]. It is estimated that nearly ten million women across the globe develop preeclampsia every year, 76,000 of whom annually lose their lives to the condition and its related hypertensive disorders. The total sum of perinatal mortality is estimated to be 500,000 per annum [2]. Despite the presence of preeclampsia, as part of a spectrum of hypertensive disorders in pregnancies, being evident in both developed and developing countries, its adverse outcomes are most particularly felt in the developing countries of the Global South. The risk of a woman from an underdeveloped country developing preeclampsia is about seven times higher than the risk for a woman from a developed country; nearly 10-25% of these women will have died from this disease [3]. Preeclampsia is one of the Hypertensive disorders of pregnancy (HDP) that complicates 2–8% of all pregnancies globally. In a tertiary care hospital in southwestern Uganda caring for a largely rural and agrarian population, HDP is the third leading cause of maternal death [4]. There is still minimal available empirical information

about knowledge of preeclampsia by women in agrarian rural settings and the factors associated with their knowledge, hence this study to determine the knowledge of PE and its associated factors among pregnant women attending Kampala International University - Teaching Hospital (KIU – TH).

Hypertension in pregnancy is one of the most common causes of both maternal and neonatal morbidity, affecting about 5 – 8 % of pregnant women in Uganda [5]. Preeclampsia is one of the Hypertensive disorders of pregnancy (HDP) that complicates 2–8% of all pregnancies globally. Adequate knowledge about a disorder contributes greatly to its prevention, control and management. Reports indicate that patient's knowledge about a disease has significant benefits on compliance to treatment and helps to abate complications associated with the disease [6]. Being a signs and symptoms-based condition, PE is a disease of signs and symptoms which requires prompt attention. Equipped with knowledge, women experiencing PE would report early to the hospital, receive timely medical intervention and have fewer adverse outcomes. This emphasizes the need for women to have adequate knowledge of the disease. However, there is very minimal available empirical information about knowledge of preeclampsia by pregnant women in rural settings in Uganda let alone the associated factors of adequate knowledge. Therefore, this study sought to determine the knowledge of PE and associated factors of adequate knowledge among pregnant women attending Antenatal care (ANC) at KIU – TH.

METHODOLOGY

Study design

A cross-sectional study design was utilised to achieve the objectives of the study.

Area of Study

This study was conducted at Kampala International University Teaching Hospital in IshakaBushenyi, Western Uganda amongst pregnant women attending ANC care at the hospital facility. The institution operates in private/public partnership with the government of Uganda and serves patients from Bushenyi and the surrounding districts of Rubirizi, Sheema, Kasese, Ntungamo and Mbarara.

Study population

All pregnant women who were attending ANC services at KIU - -TH during the study period.

Sampling method

The convenience sampling method was used to obtain participants in the study considering the eligibility criteria. All willing pregnant women attending KIU-TH during the period of data collection who met the eligibility criteria were considered in the sample.

Inclusion criteria

All pregnant women attending ANC at KIU-TH during the study period who consented were enrolled for the study.

Exclusion criteria

- Pregnant women attending KIU - TH for psychotic-related conditions.
- Pregnant women who could not respond on their own (in critical conditions)

Sample size determination

A sample size of 255 was derived by use of the survey formula by Kish Leslie (1965);

n = z2p (1−p)/d2

Where;

z = Z score for 95% confidence interval = 1.96

p = prevalence

d = acceptable error (5%)

We employed an estimated prevalence of PE in southwestern Uganda of 5.08% [4]. The actual calculated sample size was 232 and with a 10% increment to cater for nonresponses, a total of 255 subjects was arrived at.

Data collection

Data was collected using a thematic two-part questionnaire that was designed to capture the socio-demographic characteristics and knowledge of PE.

Data Processing and Analysis

Questionnaire tools were checked for their accuracy and data completeness, then data was coded and entered into Epi info version 7, then exported into SPSS version 22.0 for analysis. Descriptive statistics was used to summarize the variables. Figures and tables were used to summarize the frequencies and percentages of the variables. Univariate and multivariate logistic regression analyses were computed to determine factors associated with adequate PE knowledge. Variables with a p-value of < 0.2 during a univariate analysis were incorporated in a multivariate logistic regression model to control for confounding. Adjusted odds ratio (AOR) with a corresponding 95% confidence interval (CI) was computed to see the strength of the association and a p-value of < 0.05 was considered statistically significant. Hosmer and Lemeshow's test was utilized to test the goodness-of-fit of the final logistic regression model.

Quality control

The questionnaire was pretested amongst willing pregnant women at Ishaka Adventist Hospital prior to the actual data collection. The collected data was checked immediately after finalizing the questionnaire for completeness and consistency of the information collected.

Ethical considerations

Ethical approval was sought from Kampala International University Western Campus Faculty of Clinical Medicine and Dentistry and an introduction letter was given after to seek permission for data collection. Written and verbal consent was sought from the respondents before they were recruited into the study. The survey was carried out on 255 participants using a questionnaire which was self-administered.

RESULTS

Socio-demographic characteristics of pregnant women attending KIU – TH

A total of 255 pregnant women attending the antenatal care clinic at KIU–TH were recruited in the study. They had a mean age (years) of Mean ± SD 26.4 ± 8.1 and a Mean ± SD gestational age (weeks) of 24.4 ± 8.8. The majority of the women were married 208 (81.6%), unemployed 200 (78.4%), residing in a rural setting 177 (69.4%), had attained a primary education 165 (64.7%), were not aware if they had ever experienced preeclampsia or not 124 (48.6%) and 147 (57.7%) didn't know if there is any family history of preeclampsia or not. Shown in Table 1, Figure 2 & 3.

Table 1: Socio-demographic characteristics and history of PE among pregnant women attending KIU - TH

| Variable	Mean ± SD	Min-Max
Age (years)	26.4 ± 8.1	18-35
Gestational age (weeks)	24.4 ± 8.8	4-38
	Frequency (n=255)	**Percentage (%)**
Marital status		
Single	47	18.4
Married	208	81.6
Employment status		
Employed	55	21.6
Unemployed	200	78.4
Residence		
Rural	177	69.4
Urban	78	30.6
Educational status		
No formal education	19	7.5
Primary	165	64.7
Above primary	71	27.8
Is this your first pregnancy?		
No	169	66.3
Yes **Parity**	86	33.7
≤ 2	189	74.1
> 2	66	25.9
Experienced PE before?		
Yes	17	6.7
No	114	44.7
I don't know	124	48.6
Family history of PE		
Yes	11	4.3
No	97	38.0
I don't know	147	57.7
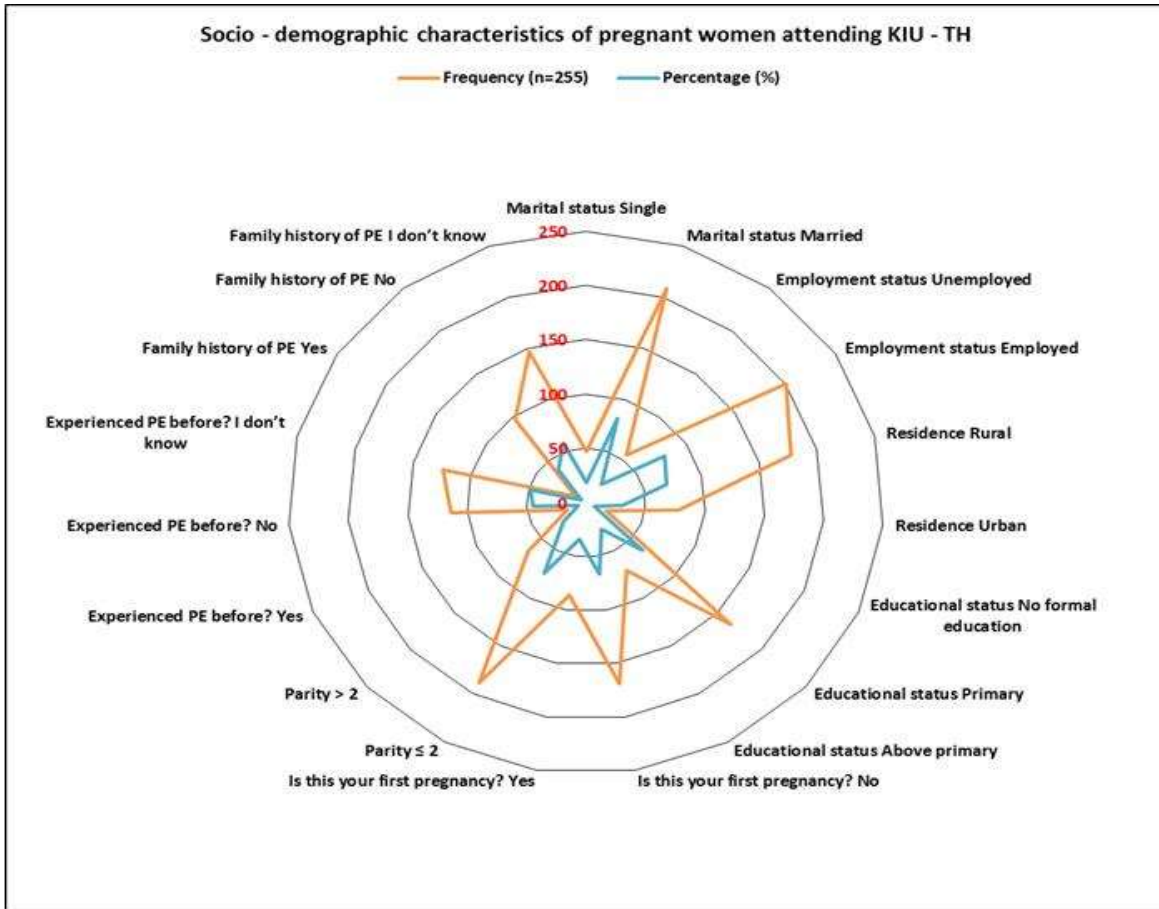
Figure 1: A radar graph chart showing sociodemographic characteristics and history of PE among pregnant women attending KIU – TH
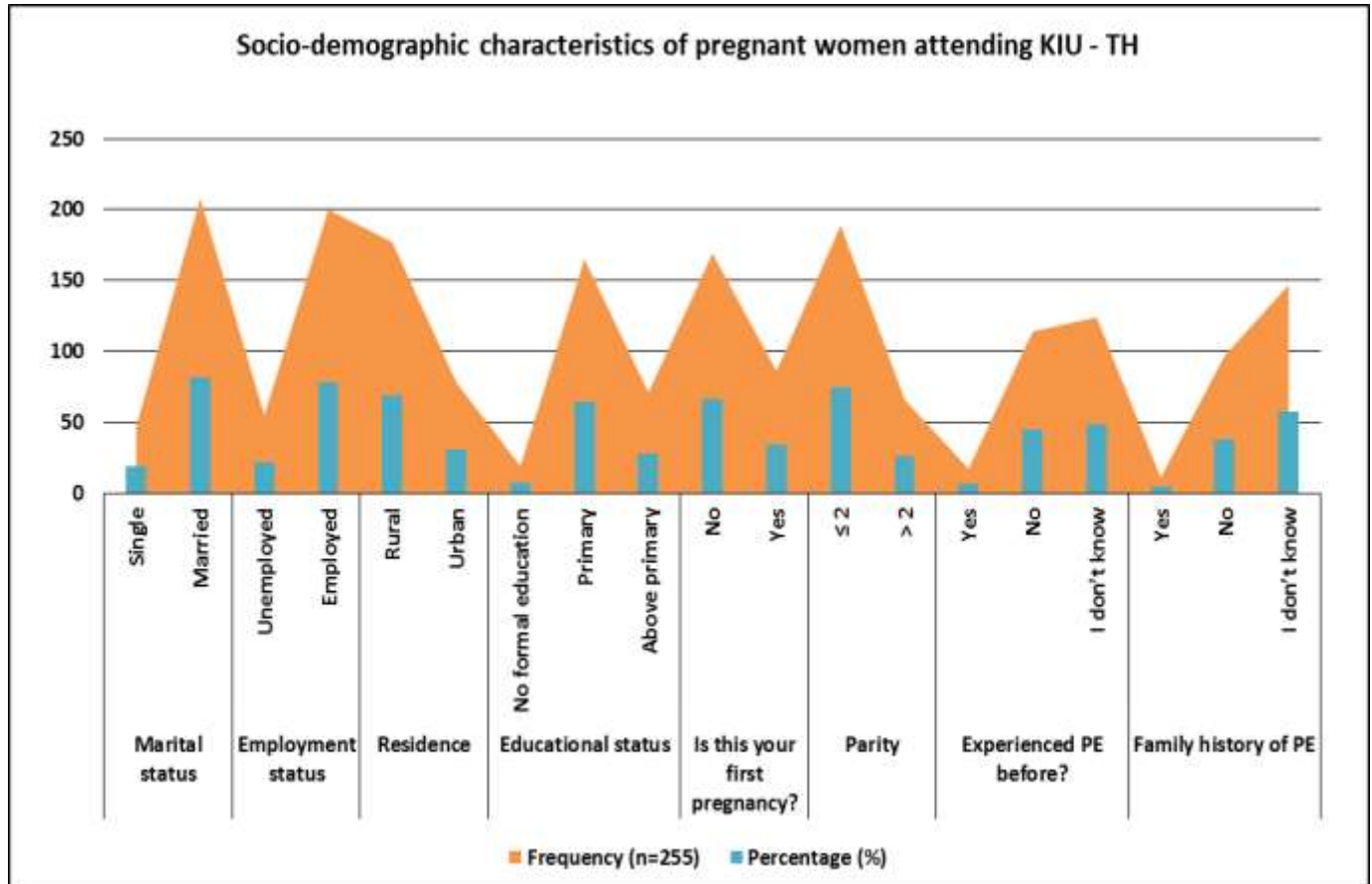
Figure 2: A stacked column – bar area graph chart showing sociodemographic characteristics and history of PE among pregnant women attending KIU – TH

Knowledge of PE, potential risk factors, symptoms and their associated complications by pregnant women attending KIU – TH.
The majority of the pregnant women had never heard about PE 154 (60.4%), considered high blood pressure as a sign of PE 109 (42.7%), considered a family history of PE as a risk factor for PE 103 (40.4%), considered maternal death as the greatest complication of PE 174 (68.2%), while 106 (41.7%) didn't know the severity of PE, 120 (47.1%) didn't know whether they were careful about PE or not and only 27 (10.6%) were aware of the likeliness to experience PE at ≥ 20 weeks of gestation as shown in Table 2, Figure 4 & 5.

Table 2: Response to questions on knowledge of PE, risk factors, symptoms and complications by pregnant women attending KIU - TH

| Question	Responses	Frequency (n)	Percentage (%)
Have you heard of PE?	Yes	101	39.6
	No	154	60.4
What are some of the signs/symptoms of PE?	High blood pressure (during pregnancy)	109	42.7
	Persistent headache	94	36.9
	Nausea and vomiting	92	36.1
	Back pain	79	31.0
	Blurred vision	66	25.9
	Abdominal pain	64	25.1
	Oedema	46	18.0
	Chest pain	22	8.6
What are some of the risk factors for PE?	Family history of PE	103	40.4
	Diabetes	89	34.9
	Obesity	89	34.9
	Unhealthy lifestyle	81	31.8
	Having prior PE	75	29.4
	Multiple births	68	26.7
What are some of the complications of PE?	Maternal death	174	68.2
	Fetal death	158	62.0
	Heart disease	118	46.3
	Kidney dysfunction	106	41.6
When is one likely to experience PE?	≥ 20 weeks of gestation	27	10.6
How severe is PE?	Very severe	91	35.6
	Severe	33	12.9
	Not severe	25	9.8
	I don't know	106	41.7
Are you careful about PE?	Yes	74	29.0
	No	61	23.9
	I don't know	120	47.1
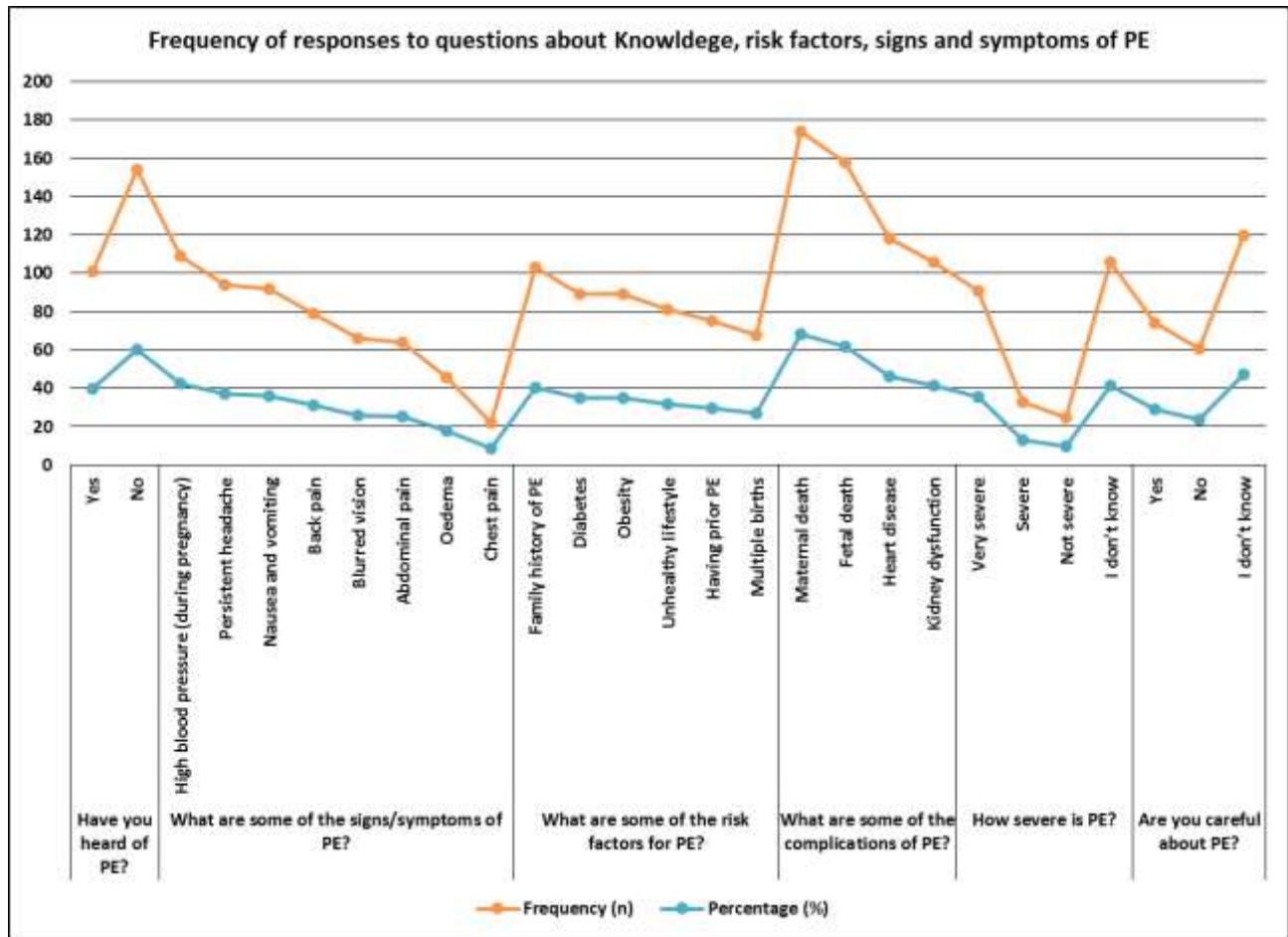
Figure 3: Stacked line graph showing responses to questions on knowledge of PE, risk factors, symptoms and complications by pregnant women attending KIU – TH
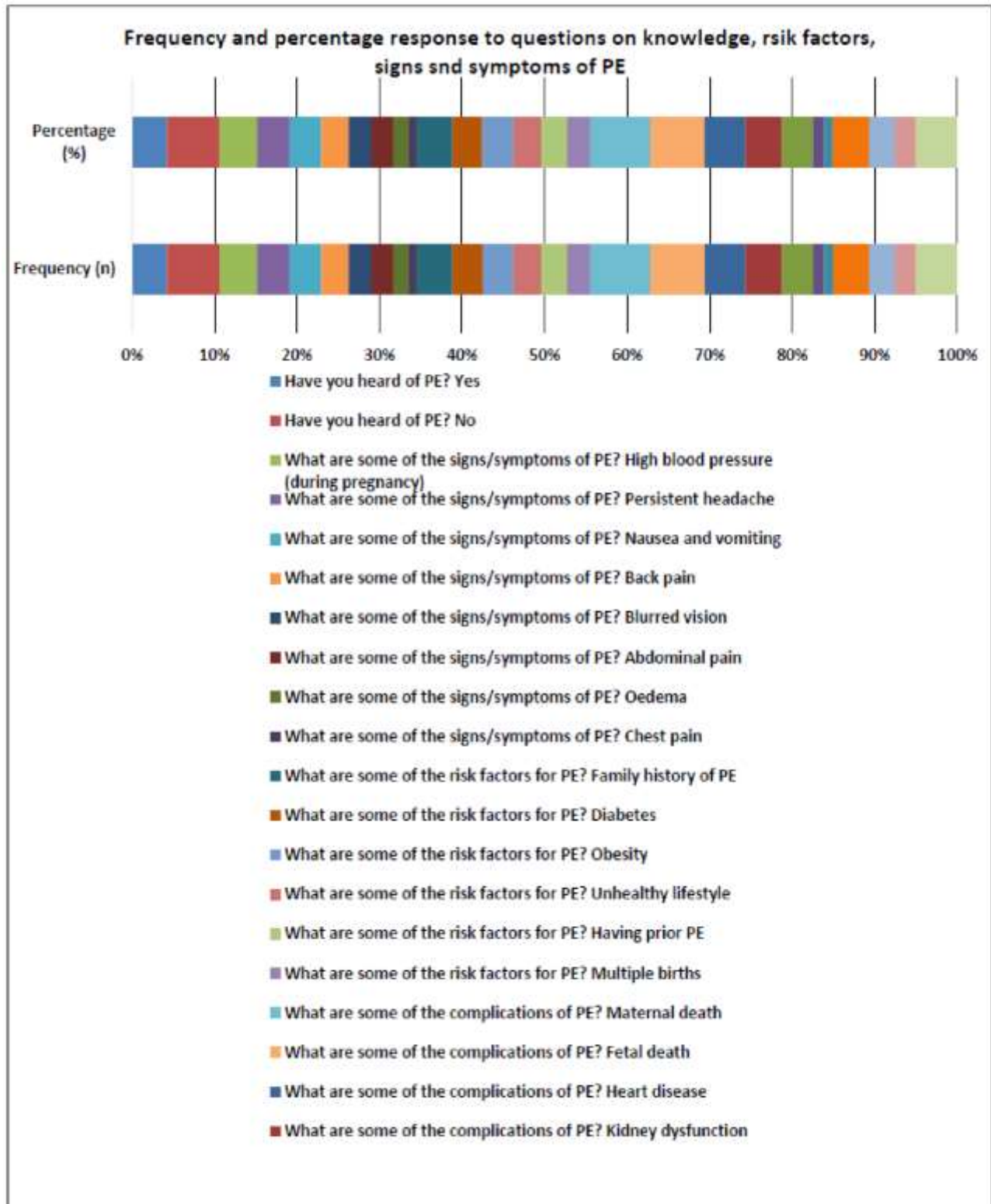
Figure 4: 100% stacked bar graph showing responses to questions on knowledge of PE, risk factors, symptoms and complications by pregnant women attending KIU – TH

Univariate and Multivariate analysis of factors associated with adequate knowledge of PE among pregnant women attending KIU-TH

In a univariate logistic regression model, being aged above 35 years, having an education above primary level, and having parity of >2 were significantly associated with having adequate knowledge at [cOR = 2.50, 95% CI (0.65-10.12), p=0.045], [cOR = 3.85, 95% CI (2.00-8.72), p=<0.001], [cOR = 1.04, 95% CI (0.40-2.50), p=0.048] respectively as shown in Table 3. However, when potential confounders were controlled in a multivariate logistic regression model, only education level turned out to be independently associated with adequate knowledge of PE at [aOR = 2.60, 95% CI (1.24-7.20), p = 0.001] as shown in Table 3. Having a primary education, having had more than one pregnancy and having experienced PE before, which were not significantly associated with adequate PE knowledge in a univariate logistic regression model turned out to be independently associated with adequate PE knowledge in the multivariate logistic regression model after controlling potential confounders at [aOR = 1.08, 95% CI (0.20-4.82), p = 0.002], [aOR = 1.64, 95% CI (0.20-3.68), p = 0.042] and [aOR = 1.42, 95% CI (0.20-4.80), p = 0.035] respectively as shown in Table 3.

Level of knowledge of PE by pregnant women attending KIU-TH

Using a stratified approach to classify the level of knowledge according to Bloom's cut-off point, 89.4% of the pregnant women attending KIU – TH had inadequate knowledge about PE with a mean score of 51.5 ± 5.0 as 10.6% had adequate knowledge with a mean score of 72.8± 3.6 as shown in Figure 5.

Of the 10.6% of pregnant women with adequate knowledge of PE, 7.7% had moderate knowledge of PE with a mean score of 64.8± 5.0 while the 2.9% proportion had high knowledge with a mean score of 82.9 ± 2.5 as shown in Figure 6.

Table 3: Univariate and Multivariate logistic regression analysis of factors associated with adequate knowledge of PE among pregnant women attending KIU - TH

Variable knowledge	Inadequate		Adequate		cOR	(95% Cl)	p –value	aOR	(95% Cl)	p-value
	n	%	n	%						
Age (years)										
< 25	43	82.7	9	17.3	1			1		
25–35	129	78.2	36	21.8	2.00	0.50–7.50	0.120	0.70	0.25–3.54	0.650
> 35	32	84.2	6	15.3	2.50	0.65–10.12	**0.045***	1.42	0.35–5.75	0.622
Marital status										
Single	31	83.8	6	16.2	1					
Married	174	87.9	!4	12.1	1.30	0.10–5.00	0.500			
Employment status										
Employed	41	74.5	14	25.5	1			1		

	N	%	n	%	OR	CI	p	AOR	CI	p
Unemployed **Residence**	174	87.0	?6	13.0	0.30	0.10–1.78	0.120	0.65	0.20–2.40	0.200
Urban	63	80.8	15	19.2	1					
Rural **Educational status**	165	93.2	?2	6.8	1.50	0.50–3.80	0.490			
No formal educati on	17	89.5	2	10.5	1				1	
Primary	147	89.1	18	10.9	1.22	0.30–4.00	0.158	1.08	0.20–4.82	**0.002***
Above primary	41	57.7	30	42.3	3.85	2.00–8.72	**<0.001***	2.60	1.24–7.20	**0.001***
Is this first your Pregnancy?										
Yes	136	80.5	33	19.5	1					
No **Parity**	67	77.9	?9	22.1	1.10	0.54–2.21	0.108	1.64	0.20–3.68	**0.042***
0–2	153	80.9	36	19.1	1					
> 2 **E** **Family history of P**	51	77.3	?5	22.7	1.04	0.40–2.50	**0.048***	1.88	0.25–4.50	0.152
No	91	93.8	6	6.2	1			1		
Yes **Experienced PE before?**	9	81.8	2	18.2	1.80	0.50–4.60	0.214	0.53	0.22 - 1.50	0.245
No	94	82.5	20	17.5	1					
Yes	11	64.7	6	35.3	1.63	0.48–5.51	0.094	1.42	0.20–4.80	**0.035***

Figure 5: Bar graph showing level of PE knowledge of pregnant women attending KIU – TH
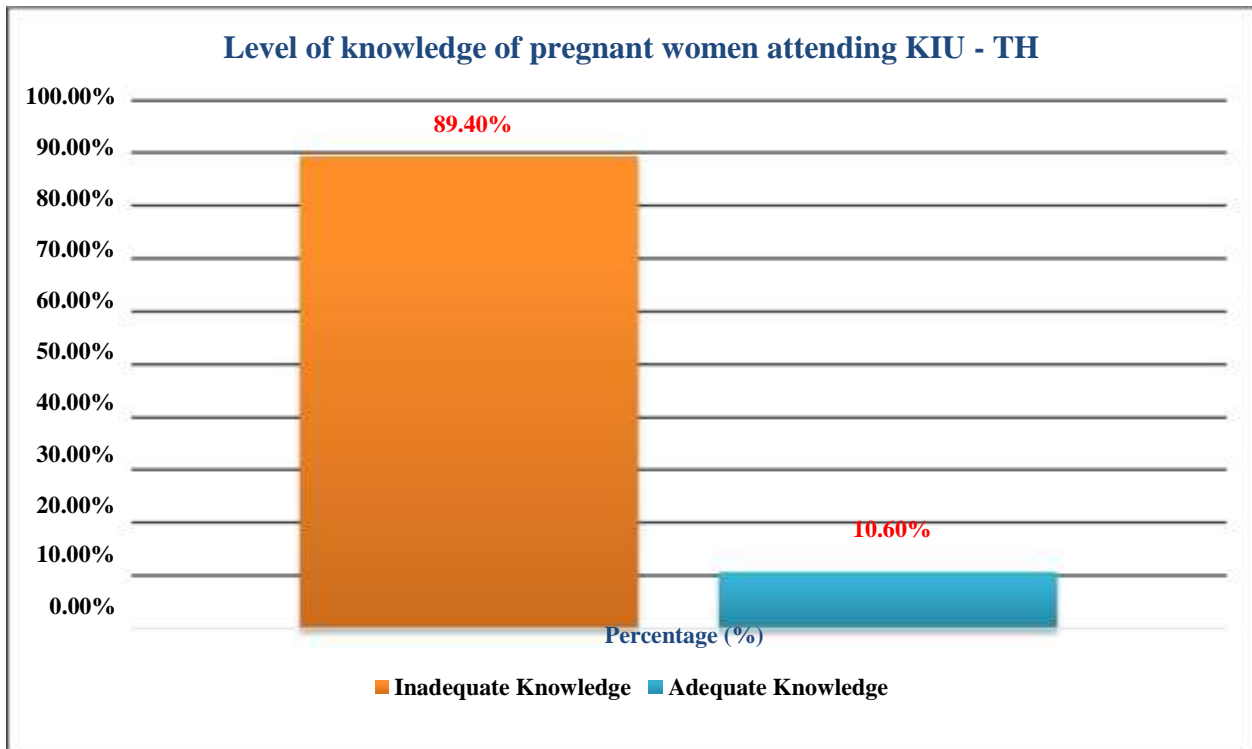
Figure 6: Area graph showing level of PE knowledge of pregnant women attending KIU – TH
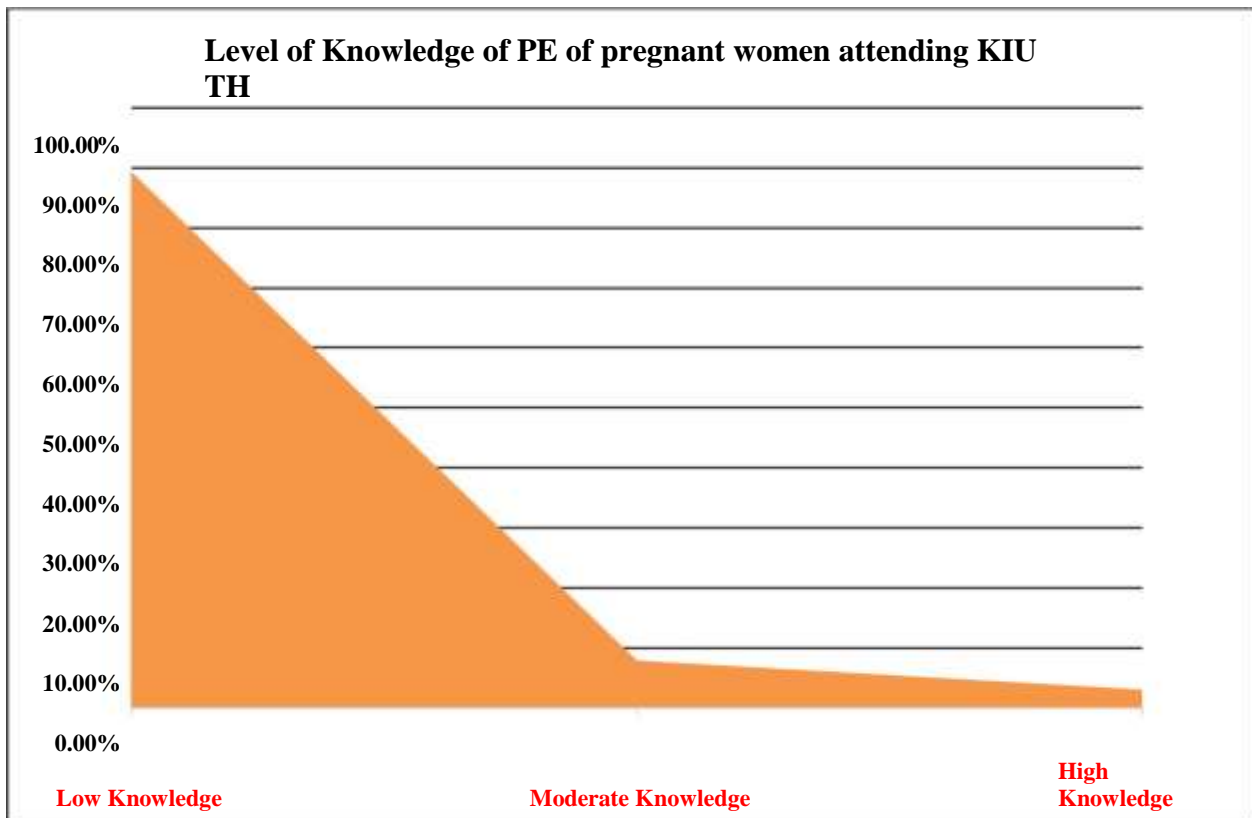
Figure 8: Bar graph showing level of PE knowledge of pregnant women attending KIU – TH
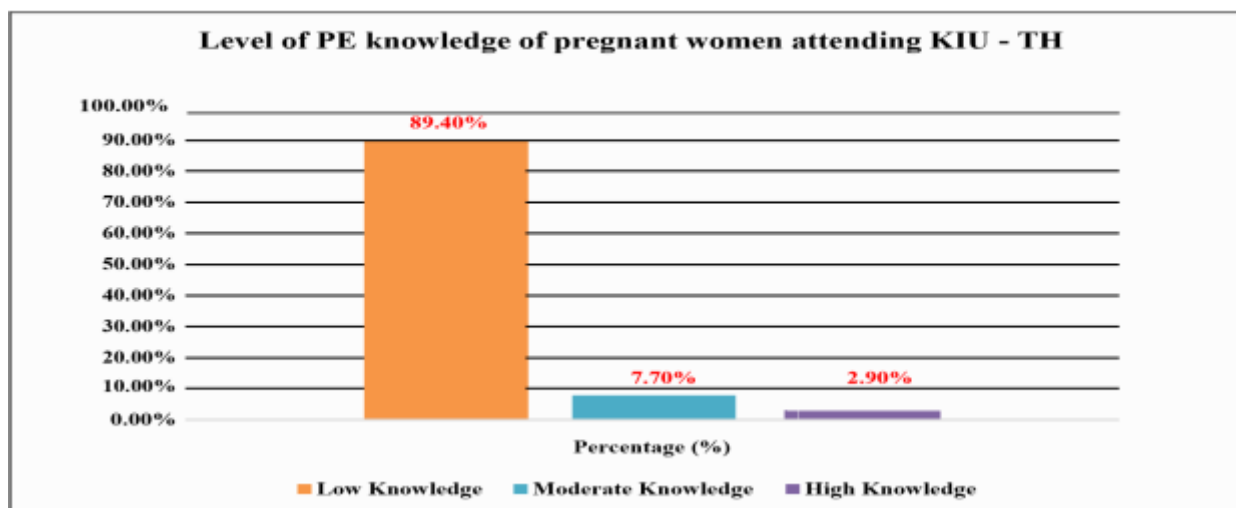
DISCUSSION

Socio-demographic patterns of the study populations

The pregnant women attending KIU – TH for antenatal care had a mean age (years) of Mean ± SD 26.4 ± 8.1 and Mean ± SD gestational age (weeks) of 24.4 ± 8.8. The majority of the women were married 208 (81.6%), unemployed 200 (78.4%), residing in a rural setting 177 (69.4%), had attained a primary education 165 (64.7%), were not aware if they had ever experienced preeclampsia or not 124 (48.6%) and 147 (57.7%) didn't know if there is any family history of preeclampsia or not. This socio-demographic characteristic pattern is consistent with that from a study in Rwanda and Southwestern Uganda that reported the groups they studied to be mostly married, unemployed, and residing in a rural setting with less awareness about PE as a concern to them as pregnant women [4]; [7]. However, this same socio-demographic pattern is partially consistent and partially contradicted by a study from Ghana where the majority of the pregnant women were married, had attained primary education and were less aware of PE as a subject, the majority were also employed and residing in an urban setting [8]. A systematic review of knowledge of PE among pregnant women in sub-Saharan countries also found generally that women with less awareness about PE were married, residing in rural settings and were unemployed thus corroborating the findings of this study [9]. A study that dealt with the same topic looking at pregnant women in very developed countries of Australia, Canada, Denmark, Norway, Scotland, Sweden and the United States of America found that even though all resided in urban settings by virtue of the countries' infrastructure ratings, the majority were unemployed, less educated and of average knowledge about PE [10].

Knowledge of PE by pregnant women attending KIU–TH

The study revealed that 89.4% (228 out of 255 participants) had inadequate knowledge about preeclampsia with a mean score of 51.5 ± 5.0. Only 10.6% (27 out of 255) had adequate knowledge about preeclampsia with a mean score of 72.8± 3.6. Of the 10.6% of pregnant women with adequate knowledge of PE, 7.7% had moderate knowledge of PE with a mean score of 64.8± 5.0 while the 2.9% proportion had high knowledge with a mean score of 82.9 ± 2.5. The findings of this study are nearly consistent with findings of studies in Tanzania, Kenya, Rwanda, Nigeria, South Africa, Zambia, Zanzibar, Ethiopia, and Ghana and reportings from a systematic analysis of

African countries that all showed a very high inadequate knowledge about PE by pregnant women [11]; [8]; [12]; [13]; [14]; [15]; [2]; [16]; [7]. The studies from the United States and Britain show a different opposite with pregnant women well knowledgeable about PE; however, these 2 studies reported the majority of women being well educated with education at primary and above showed independent association to adequate knowledge in this very study [17]; [18].

Factors associated with adequate knowledge of PE among pregnant women attending KIU – TH

The analysis revealed that age above 35 years, having an education above primary level, having a parity of >2 and having a diagnosis of preeclampsia in the previous or current pregnancy were significantly associated with having adequate knowledge at [p=0.045], [p=<0.001], [p=0.048] respectively in a univariate logistic regression model. However, when potential confounders were controlled in a multivariate logistic regression model, only education level turned out to be independently associated with adequate knowledge of PE at [aOR = 2.60, 95% CI (1.24–7.20), p = 0.001]. This pattern of association is consistent with studies for China, Malaysia and Ghana [8]; [19]; [20]. Other studies have reported an independent association between adequate PE knowledge and an increase in education in the United States, Britain, Tanzania and Uganda [5]; [21]; [17]; [18]. Having a primary education, having had more than one pregnancy and having

experienced PE before, which were not significantly associated with adequate PE knowledge in a univariate logistic regression model turned out to be independently associated with adequate PE knowledge in the multivariate logistic regression model after controlling potential confounders at [aOR = 1.08, 95% CI (0.20–4.82), p = 0.002], [aOR = 1.64, 95% CI (0.20–3.68), p = 0.042] and [aOR = .42, 95% CI (0.20–4.80), p = 0.035]. Primary education being independently associated with adequate knowledge in a more stable multivariate model where confounders are controlled is not known, it further cements the argument of previous conclusions and of this very study that PE knowledge increases with increased education. A systematic review of African countries attributed this pattern to the ability of more educated women to comprehend and make decisions about issues of health, choosing to use health information being one of them [2]. However, not much literature is available to offer an elaborate assessment of the increase in odds of adequate knowledge of PE in women of more than one pregnancy and having experienced PE before. In a narrative of factors that affect women speaking up about early warning signs and symptoms of pre-eclampsia, [22] attribute this pattern to mere experience and thus keep the women aware and able to respond better next time they are pregnant, however, this seems more of a personal opinion than a statistically arrived at conclusion [22].

CONCLUSION

The study found that 89.4% of pregnant women at KIU-TH have inadequate knowledge of Physical Education (PE). A history of PE and multiple pregnancies were found to be independent associations with adequate PE knowledge.

Primary education was also found to be significantly associated with adequate PE knowledge, indicating that better education increases the odds of PE knowledge.

Recommendations

The study reveals that primary education significantly influences pregnant women's knowledge of Pregnancy-Ending Conditions (PE), thereby improving their management outcomes. Therefore, it is recommended to design health education

programs specifically targeting pregnant women in rural areas to maximize the impact of education on controlling and managing PE outcomes among pregnant women

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