

Knowledge of pre-eclampsia in women living in Makole Ward, Dodoma, Tanzania.

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Abstract

Background: Pre-eclampsia is a hypertensive disorder specific to pregnancy responsible for significant maternal morbidity and mortality in Africa. The majority of deaths related to pre-eclampsia could be avoided with timely and effective care. "Phase one delays" arise because of lack of knowledge.

Objectives: This study aimed to assess the knowledge levels of women living in Makole ward, comparing respondent subgroups with different demographic characteristics. It also aimed to compare knowledge levels in respect to six subtopics of pre-eclampsia. This was to allow for planning of appropriate activities to reduce delays in seeking health care.

Methods: This study surveyed 200 adult women randomly identified in the community. They were asked 36 questions on pre-eclampsia requiring yes / no answers. The data was analysed quantitatively.

Results: Overall knowledge levels were low with an average of 41% of correct answers. Minor differences in the knowledge levels of demographic subgroups were found. Statistically significant differences were identified between sub-topics of pre-eclampsia; signs and symptoms were the least well known.

Conclusion: Educational systems (formal and informal) are failing to provide communities with potentially life-saving information. Health centre, community and school based education programmes are recommended.

Keywords: Pre-eclampsia, knowledge, Makole, Dodoma, Tanzania.

DOI: <http://dx.doi.org/10.4314/ahs.v16i2.9>

Cite as: Savage AR, Hoho L. Knowledge of pre-eclampsia in women living in Makole Ward, Dodoma, Tanzania. *Afri Health Sci* 2016;16(2): 412-419. <http://dx.doi.org/10.4314/ahs.v16i2.9>

Introduction

Studies on knowledge levels of pre-eclampsia and eclampsia have been carried out in different countries. In the United States of America¹ 112 pregnant women were asked 25 questions on the symptoms, consequences, and proper patient actions associated with pre-eclampsia. The average score was 43%; higher scores correlated with higher literacy levels, multiparity, personal experience of pre-eclampsia, and having received information from a health worker or other source.

An Australian postal survey of 68 women who had experienced pre-eclampsia found that 77% of them had no prior knowledge of the condition, and 51% did not ini-

tially realise how serious the condition could be. They reported feeling a loss of control, depression and anxiety.²

A study in Brazil collected data from 120 women via a social network site, 20% of whom had been pregnant at least once. Low knowledge levels were found in this group even though they all had access to the internet. It was found that 50% of the sample had no knowledge at all of pre-eclampsia.³

In India, a study identified locally held beliefs on causes and danger signs of pre-eclampsia. This study used 14 focus groups with a total of 219 community participants. The findings suggest that perceptions of pre-eclampsia have little congruence with current evidence, for example, anaemia and exposure to fire or water were considered as predisposing factors for pre-eclampsia.⁴

Another study in India with 108 women attending a hospital antenatal clinic investigated knowledge levels of pre-eclampsia using a structured questionnaire. It found "good" levels of knowledge in 14% of the sample, and

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statistically significant correlations between levels of knowledge and age, occupational status, educational status and income levels.⁵

In Sokoto, Nigeria⁶ 159 relations of 56 patients brought to a referral hospital with eclampsia were interviewed about their beliefs about the causation of eclampsia. Only six of these relations associated high blood pressure with eclampsia. Seventy five of the participants attributed the eclampsia to evil spirits, seven blamed God and 32 reported having no idea of the cause of eclampsia. Forty of the 56 patients had been given traditional treatment before being brought to hospital.

The results of the different studies reflect the different study aims, sample types (for example in terms of gender, previous experience of pre-eclampsia, being a 'patient' or a 'relative'), sample sizes and different tools. The studies were also carried out in a variety of socio-cultural settings. In spite of the heterogeneity of samples and settings, the majority of this sample of published work suggests that knowledge levels of pre-eclampsia and are generally low.

There appears to be no published work from Tanzania on this subject.

Hypertensive diseases of pregnancy, notably pre-eclampsia and related conditions, are responsible for significant morbidity and for nearly one-tenth of maternal deaths in Africa. Pre-eclampsia only occurs in pregnancy. It is diagnosed when there is a new episode of hypertension (diastolic blood pressure consistently >90 mm Hg) and substantial proteinuria (>0.3 g/24 h). Pre-eclampsia may be mild at first, but can slowly or rapidly develop into severe pre-eclampsia, characterised by rising hypertension, increasing proteinuria or substantial maternal organ dysfunction. Symptoms of worsening pre-eclampsia occur in the majority of cases and include frontal headache, epigastric pain and visual disturbances.⁷ In the Tanzanian context, frontal headache and visual disturbances have been found to be particularly associated with imminent eclampsia.⁸ Severe pre-eclampsia can develop into eclampsia (with fits) or HELLP syndrome (haemolysis, elevated liver enzymes and low platelet count).⁷

The underlying cause of pre-eclampsia is only partially understood; the pathology appears to originate in the placenta. There is lowered placental perfusion that is thought

to be related to immunological factors, genetic factors, or lowered threshold (which may occur with pre-existing hypertension or chronic renal problems). In some cases, pre-eclampsia appears to be related to increased demand on the placenta, as in multiple pregnancy. The pathological changes that take place in pre-eclampsia are endothelial damage, vasoconstriction, and increased vascular permeability. Clotting function may also be affected. Damage to maternal organs and reduction in supply of oxygen and essential nutrients for the fetus may occur.⁹

Various risk factors have been identified that include obesity, chronic hypertension, diabetes, adolescent pregnancy, and first pregnancy. Interventions aimed at primary prevention are being actively researched; calcium supplementation and low-dose aspirin appear to have some value in specific situations. While antihypertensives and magnesium sulfate are amongst the management options, the delivery of the fetus resolves pre-eclampsia. Timing and method of delivery depend on various factors including the severity of the condition and gestation of the pregnancy.^{7,9}

Early diagnosis and management can help to reduce the dangers of pre-eclampsia and its complications; the majority of deaths related to this condition are avoidable when care is given in good time. Avoiding delays and "bottlenecks" that are currently occurring in diagnosis and management are critical in this regard.¹⁰ Three phases of delay have been identified; "phase one delays" relate to the time taken to make a decision to seek care, "phase two delays" involve problems in reaching care and "phase three delays" encompass issues in provision of care.¹¹ This study was concerned with identifying potential "phase one delays" relating to levels of knowledge. The overall objective was to assess the knowledge levels of women who are living in Makole Ward in respect to pre-eclampsia. Specific objectives were to assess knowledge levels in relation to risk factors, signs, symptoms, dangers, prevention and management of pre-eclampsia.

The study's significance was that the findings could justify and guide use of appropriate educational interventions related to a potentially serious condition that is likely to increase in prevalence in Africa in the future.¹² Educational interventions that result in a reduction in "phase 1 delays" contributing to maternal morbidity and mortality, help to address Millennium Development Goal number 5.¹³

Methods

The research area for the study was Makole Ward, which is one of 30 wards in Dodoma Urban District of Dodoma Region in central Tanzania. The population of Makole have nearby access to a government health centre. The community-based study was a survey using quantitative methods, in which data was collected in June 2015. The tool used was a set of 36 questions requiring a yes / no answer, with six questions each on six subtopics, as per appendix A. The tool was developed by the authors after examining tools used in other studies, and using evidence based up to date content from reliable sources. Six key content areas found in many sources were used, that is, risk factors, symptoms, signs, prevention, management and complications. There was a random mixture of correct and incorrect statements to reduce response bias. The tool was composed in English and translated into Swahili, and then pre-tested with five individuals meeting the inclusion criteria but not later included in the sample.

Some minor adjustments were made to ensure that the questions were understandable. The questions were asked in Swahili using face-to-face interviews, to allow for provision of explanations where needed and to promote response rate. The research assistants recorded a yes / no response to each question. The population under consideration was all the adult females living in Makole Ward; inclusion criteria were being an adult female resident in Makole and willing to participate in the study. The total female population of Makole was found to be 5,551 in the 2012 census¹⁴, so the adult female population in this ward is currently about 3,000. All the streets were identified on a map, and streets were then identified randomly. Research assistants went from house to house along those streets, interviewing any women who were available

and willing to take part, until a total sample of 200 was reached. The random selection of streets promoted the representativeness of the sample. The minimum sample of 97 was planned to allow for a 10% confidence level¹⁵; a larger sample that was logistically possible within the time frame was used. Ethical clearance was obtained from the researchers' University, and permission was obtained from the District Medical Officer and District Executive Officer to collect data. Verbal informed consent was obtained from every respondent to avoid recording names and thereby maintaining confidentiality, and interviews were held where they could not be overheard to ensure privacy. No respondent names or personal identifiers were recorded or used in the report. Data were entered into an Excel spreadsheet using the yes / no answers that were then converted into correct / incorrect answers as indicated in Appendix A. Correct answers were given a score of one and incorrect answers zero, to allow for totaling of correct answers. The data was then sorted according to the subgroups of interest. Percentages were calculated and a comparison of subgroups within the demographic groups was made to identify any part of the community with particularly low knowledge levels. Subgroup data was tested for statistically significant differences using Chi-square test.

Results

The sampled population represented subgroups within the four demographic aspects considered in this study (Table 1). The overall average correct score was found to be 41%. While the ranges per demographic group show some variation, with the biggest range seen in the educational level subgroups, there were no statistically significant differences between demographic subgroups (Table 2).

Table 1. Demographic characteristics of sample and average correct answers to questions on pre-eclampsia per demographic subgroups of respondents (n=200)

Demographic aspect	Number of respondents	Average percentage of correct answers
Age in years		
< 28	87	41
28-37	60	42
38-47	37	43
>47	16	33
Daily income in Tanzanian shillings		
< 2000	69	37
2000-4000	58	41
> 4000	73	46
Marital status		
Single	67	43
Married	98	42
Widowed	14	41
Divorced	21	36
Educational level		
Not attended school	23	29
Attended to end of primary school	97	40
Attended secondary school	51	45
Attended college	29	48

Table 2. Range and statistical significance of average scores per demographic group

Demographic group	Range of average % scores	p value #
Education	18.6	0.18
Age	10.8	0.71
Economic status	9.2	0.56
Marital status	7.4	0.83

* Across subgroups of demographic groups

Chi square test for statistical significance of differences between averages in sub-groups of demographic groups: none of these values statistically significant

A comparison of correct response rates per question type was made to identify any particularly low knowledge areas. Signs and symptoms questions had the lowest correct response rates. The individual question with the lowest correct response rate related to epigastric pain as a

symptom of pre-eclampsia; only 13% of the respondents answered correctly. There was a statistically significant difference between average correct response rates of the 6 different question groups when tested with Chi-square test ($p=0.004$).

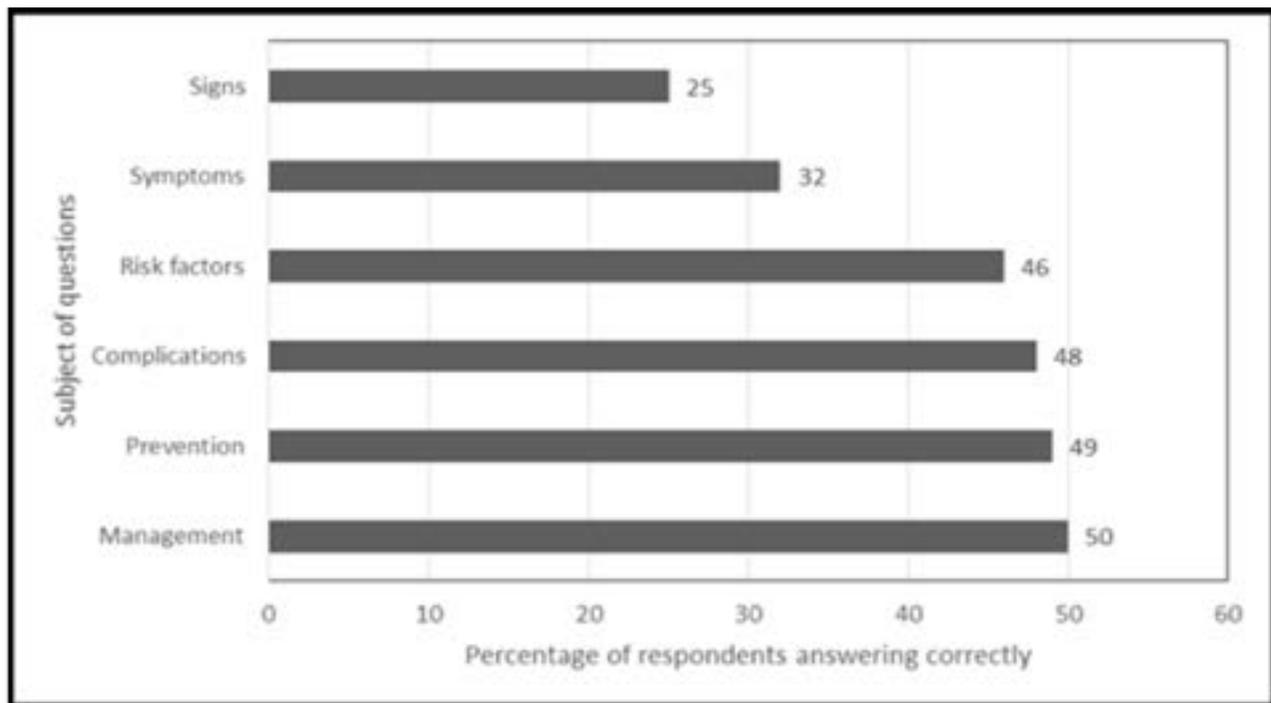


Figure 1: Subject area response levels: percentage of respondents answering correctly per subject area of questions relating to pre-eclampsia (n=200)

Discussion

The overall low knowledge levels in all four demographic sub-groups (education, age, economic status and marital status) in this study add to the evidence from a variety of population samples (such as those described in the background section) also found to have low knowledge levels on pre-eclampsia.¹⁻⁶ The low levels of knowledge in a heterogeneous sample of studies suggests that life-saving health education is being neglected across different population groups and countries.

Previous studies have not all differentiated between areas of knowledge and population subgroups; this study found signs and symptoms to have the lowest knowledge levels, although these are the most important in terms of preventing delay in seeking treatment. The highest scores were noted in the most economically well off group, and in the most educated group. The latter finding is congruent with studies in the United States and India discussed above.^{1,5} In the current study, even these two groups with the highest knowledge levels answered less than 50% of the items correctly.

Two questions in the tool used in this study reflected traditional beliefs, and were about evil spirits and exposure to fire. Half of the participants agreed and half disagreed that these are causative agents for pre-eclampsia. Traditional beliefs dominated studies in India⁴ and Nigeria⁶; the population of this study are urban dwellers for whom traditional beliefs are still held by some, but not all of the population.

It is important for community members in all countries to be aware of the health conditions that may significantly affect them, particularly in countries where health services are not readily accessible.¹⁶ While regular attendance at antenatal clinics helps to identify some pregnant women at particular risk, pre-eclampsia is a condition that can become serious within a short period of time, so knowledge of symptoms of worsening pre-eclampsia and the potential seriousness of the condition may help to save lives.

Conclusion

Women in all population groups in the study sample are at risk of “phase 1 delays” due to lack of knowledge about

pre-eclampsia, and the health complications and death that may result from delays. Even women who have had the privilege of a college education are not significantly better equipped with important “life skills” knowledge than other members of the community.

Data from this sample suggests that educational systems (formal and informal) are failing to provide communities with some life-saving information.

The most important information for women to know about pre-eclampsia (signs and symptoms) appears to be little known in this population group.

Recommendations

It is recommended to introduce relevant and innovative education programmes for all pregnant women, community members in general (especially those responsible for family decision making), and at primary and secondary schools. This could be part of family life and HIV

education programmes such as have been introduced in Nigeria¹⁷, or national programmes to accelerate reduction of maternal morbidity and mortality¹⁸ that include community education and mobilization on pre-eclampsia, haemorrhage and obstructed labour. The development and use of culturally and linguistically appropriate materials particularly for under-resourced community settings is recommended.¹⁶ The seriousness of the condition, the importance of regular checks at a health facility, and the symptoms of worsening pre-eclampsia such as frontal headache, epigastric pain and visual disturbances should be included in these programmes.

Conflicts of interests

There are no conflicts of interests related to this study

Sources of funding

There were no external sources of funding used for this study

Appendix A. Questions used with respondents (English version) (shaded rows “correct” statements)

Q. no.	Question used with respondent
1.	Which of the following are the risk factors for pre-eclampsia?
a)	Diabetes
b)	Evil spirits
c)	A history of high blood pressure before conception
d)	Exposure to fire during pregnancy
e)	Overweight
f)	Singleton pregnancy
2.	Which of the following symptoms may be experienced in pre-eclampsia?
a)	Severe headache
b)	Increased urine output
c)	Visual disturbance
d)	Epigastric pain (central just below ribs)
e)	Severe back pain
f)	Sudden swelling of the face, hands or feet
3.	Which of the following signs identified by the nurse are common in pre-eclampsia?
a)	A lot of fluid in the womb in severe pre-eclampsia
b)	Baby larger than average
c)	High temperature during pregnancy
d)	Low blood levels of calcium
e)	Low blood pressure
f)	Presence of protein in the urine
4.	Which of the following may help to prevent pre-eclampsia and its serious risks?
a)	Eating calcium rich diet such as, fish, milk
b)	Use of hormones during pregnancy
c)	Bed rest from 24 th week
d)	Regular clinic attendance
e)	Use of drugs that prevent the formation of blood clots in women at high risk
f)	Use of drugs (such as “Lasix”) that remove water from the body
g)	Use of a salt free diet
5.	Which of the following are part of the management of pre-eclampsia?
a)	Admission to hospital in severe pre-eclampsia
b)	Use of medicines to treat infection (e.g. amoxicillin)
c)	Early delivery if close to term
d)	Use of vitamins C, D or E
e)	Use of drugs that prevent fits (e.g. magnesium sulfate)
f)	Return visit 6-8 weeks after delivery
6.	Which of the following are complications of pre-eclampsia?
a)	Maternal death
b)	Risk for low blood pressure in the subsequent pregnancy
c)	Fetal death
d)	Higher than average birth weight
e)	Recurrence of pre-eclampsia in a subsequent pregnancy
f)	Loss of memory after birth

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