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Evaluation of correct knowledge of key danger signs in pregnancy among antenatal clinic attendees at a tertiary health facility in Nigeria

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Abstract

Context: Test of knowledge of pregnant women on key danger signs as a marker to assess the quality of information shared during health education at the antenatal clinic (ANC) is desirable.
Aim: The aim was to assess correct knowledge of danger signs among pregnant women who attend ANC.
Settings and Design: A cross-sectional design conducted among pregnant women at the ANC of the University College Hospital, Ibadan, Nigeria.
Materials and Methods: A pretested structured questionnaire that contains sociodemographics, past obstetrics history, and a list of test questions to assess correct knowledge of danger signs was administered to each consenting participant.
Statistical Analysis Used: Descriptive and bivariate analyses were performed. The knowledge score of key danger signs in pregnancy (KDSP) was measured on a scale of 0–7 and participants were scored as having poor (0–2), fair (3–4), or good (5–7) knowledge. The reliability of the questionnaire to assess knowledge score was determined with Cronbach's alpha. Statistical significance was set 5%. STATA 12.0 Software was used.
Results: The mean age of respondents was 30.28 ± 4.56 with the majority (75.1%) of respondents aged 26–35 years. The Cronbach's alpha was 0.871. In general, the knowledge score was good and the associated factors on bivariate analysis were younger age ($P = 0.028$), Islamic religion ($P = 0.048$), ethnicity ($P = 0.03$), professional occupation ($P = 0.01$), and previous attendance of health talk on KDSP ($P < 0.0001$).
Conclusion: There was a high knowledge score of KDSP, but some still have some misconceptions that need to be addressed.

Key words: Key danger signs in pregnancy, knowledge, Nigeria

Introduction

Every year over half a million women die worldwide from the complications related to or aggravated by pregnancy and childbirth.[1] About 99% of these deaths occur in developing countries, and about half of this burden is in sub-Saharan Africa.[1] At the moment, the current average

national maternal mortality ratio is about 576/100,000 live births (2013 NDHS report). The direct causes of maternal deaths are hemorrhage, sepsis, hypertensive disorders, obstructed labor, and unsafe abortion.[2] Evidence has shown that these causes are preventable and treatable

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with timely access to appropriate emergency obstetric care services.[1,3]

Early recognition of danger signs is an important indicator to seek healthcare promptly.[4] The most common danger signs during pregnancy include vaginal bleeding, headache, fever, drainage of liquor, abdominal pain, blurring of vision, facial and hand swellings.[5,6] Knowledge of obstetric danger signs and birth preparedness enhance utilization of skilled care during childbirth, and emergency obstetric care services.[7] Previous studies have reported different prevalence of awareness of danger signs in different settings among pregnant women.[8,9] For example, Kabakyenga *et al.* identified severe vaginal bleeding as the most mentioned complication by women during pregnancy (49%), childbirth (64%), and postpartum (57%) period.[6] studies elsewhere also observed similar findings.[9,10]

The following factors have been associated with awareness of danger signs during pregnancy in previous studies, and they include; age, educational level, number and place of deliveries, number of antenatal care visits, and woman informed of risk/complication during antenatal care.[9] Pembe *et al.* found no differences in the awareness of danger signs during pregnancy, delivery or after childbirth in relation to age, educational level, number and place of deliveries, number of antenatal care visits, and women informed of risks/complication during antenatal care.[11] Furthermore, some studies investigated the association between correct knowledge of danger signs and birth preparedness. Findings showed that women with knowledge of at least one danger sign were more likely to be birth prepared than those without.[5,6,12]

In most health facilities in Nigeria, routine health education is offered before clinical consultation is performed at all levels of healthcare. During this session, health care providers counsel pregnant women on various health promotional methods including discussion on key danger signs in pregnancy (KDSP). The expectation is that each of these signs could act as a catalyst for women to seek care early, and possibly avert serious adverse pregnancy outcomes and consequent fatalities. Currently, there is a dearth of information on test of knowledge of pregnant women on danger signs as a marker to assess the quality of health education as well as their understanding of it. The study, therefore, aims to fill this gap by assessing the correct knowledge of danger signs among pregnant women who attend the antenatal clinic (ANC).

Materials and Methods

The study is a cross-sectional study conducted at the ANC of the University College Hospital (UCH), one of the foremost Tertiary Health Care facility located in Oyo State,

Nigeria. The hospital has a bed capacity of about 850 beds, averaging 2000 deliveries annually. Presently, the 5 sub-specialty units of the department of obstetrics and gynecology conduct the ANC weekly with an average of 40–50 women per clinic session. At each ANC visit, the routine care involves registration, vital signs measurement, and group health talk before consultation by doctors.

At UCH, the health educators – who are nurse/midwives – offer group counselling on several health related issues including the danger signs in pregnancy at every clinic session. In addition, the doctors reinforce this information during the clinical consultation, and there is also information, education, and communication materials pasted in strategic locations within the clinic on danger signs.

An eligible pregnant woman was any booked patient that has attended at least one ANC session and consented to this study. A simple random sampling technique was used to select from a sampling frame of eligible pregnant women at every clinic session for the duration of the study. A pretested structured questionnaire that contains sociodemographics, past obstetrics history, and a list of test questions to assess correct knowledge of danger signs was administered to each participant. It was self-administered, but those that could not understand were assisted by interpreting the meaning by trained research assistants.

The initial exploratory analysis was performed and thereafter, test of association using Chi-square was performed between selected explanatory variables and the outcome measure – knowledge of KDSP. Due to multiple collinearity of explanatory variables multivariable analysis was not performed.[13] For the purpose of analysis, danger signs in pregnancy were categorized into KDSP and non-KDSP (NKDSP). The reliability of the questionnaire to assess good knowledge of KDSP was determined using the Cronbach's alpha. The knowledge of KDSP was measured on a scale of 0–7 with each correctly identified sign was allocated a mark. The seven correct KDSP used were bleeding per vagina, severe abdominal Pain, convulsion/loss of consciousness, labor pain before 37 weeks, drainage of liquor, fever, and severe headache/blurring of vision. Respondents who scored between 0 and 2 were classified as having "poor knowledge" while those who scored either 3 or 4 as having fair knowledge while those who scored 5–7 were classified as having "good knowledge." Similarly, we scored awareness of KDSP from 0 to 7, respondents who scored 0–2 were regarded as having poor awareness, three has fair awareness while 4–5 scores and 6–7 scores as good and very good awareness of KDSP, respectively. The level of statistical significance was set at 5%. The analysis was performed with STATA statistical software: Release 12. College Station, TX: StataCorp LP.

Results

Of the 570 eligible women recruited, 556 consented to participate, but only 531 had complete and valid data that was good enough for analysis giving a response rate 95.5%.

The mean age of respondents was 30.28 ± 4.56 with the majority (75.1%) of respondents aged 26–35 years and the minimum and maximum ages were 16 and 42 years respectively. Almost all respondents were Yoruba (86.4%) and had a tertiary level of education 76.8% [Table 1]. Though all respondents were recruited at the ANC, only 510 (96.0%) had attended health talk sessions during their antenatal visits with the majority attending 10 sessions and less. About half of the respondents registered for antenatal care (56.5%) and were interviewed in the second trimester (72.2%) [Table 2].
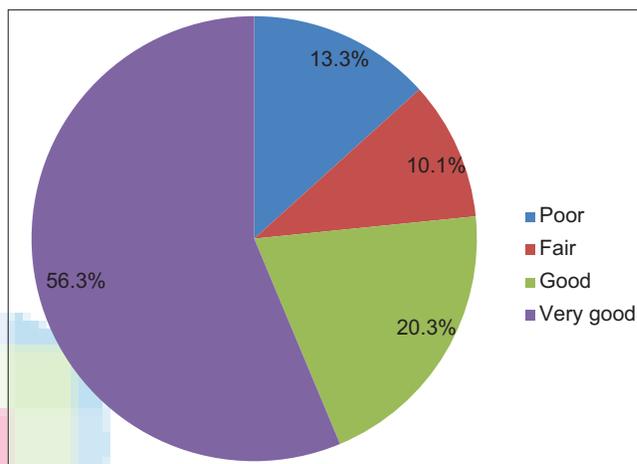
Almost all respondents had knowledge of the KDSP; 390 (76.0%) are aware of bleeding per vagina, 369 (71.5%) were aware of Severe abdominal pain, 318 (62.0%) were aware of convulsion/loss of consciousness, 324 (64.3%) were aware of labor pain before 37 weeks, 309 (61.3%) were aware of drainage of liquor, 408 (78.6%) were aware of fever while 357 (70.0%) were aware of severe headache/blurring of vision. On NKDSP, 243 (48.8%) were aware of frequent movement of the fetus, 273 (54.5%) were aware of diarrhea, 312 (62.3%) were aware of reduced fetal movement, 120 (25.0%) were aware of "verbal attack by your enemy," 129 (25.6%) were aware of excessive sleep, 279 (54.4%) were aware of difficulty in breathing. Almost all respondents knew that they should come to the hospital anytime they noticed any of the key danger signs [Table 3].

The reliability test gave a Cronbach's alpha of 0.871, which indicates a high level of internal consistency for our scale. Overall, a little over half of the respondents, 267 (56.3%) have a very good awareness of danger signs in pregnancy. About 96 (20.3%) had good knowledge of danger signs in pregnancy, while 48 (10.1%) and 63 (13.3%) had fair and poor knowledge of danger signs in pregnancy, respectively [Figure 1].

Bivariate analysis of respondents' knowledge about KDSP and some variables showed that all the respondents below 20 years had good knowledge, while there was 81.3% good knowledge among those aged 20–24 years, 63.5% among those aged

Figure 1: Overall awareness of danger signs in pregnancy

Table 1: Sociodemographic characteristics of respondents

Variable	Frequency (n=531)	Percentage
Age of respondents (years)		
Below 20	6	1.1
21-25	48	9.0
26-30	162	30.5
31-35	237	44.6
Over 35	78	14.7
Religion		
Christianity	381	71.8
Islam	159	28.2
Education		
Primary	18	3.7
Secondary	96	19.5
Tertiary	378	76.8
Tribe		
Hausa	9	1.7
Yoruba	459	86.4
Ibo	48	9.0
Others	15	2.8

Table 2: Health education sessions and awareness of danger signs in pregnancy

Variable	Frequency (n=531)	Percentage
Ever attended sessions		
Yes	510	96.0
No	21	4.0
Number of sessions		
Below 10	447	90.8
10-19	18	3.7
20 and above	27	5.5
Gestational age at booking (weeks)		
≤12	120	23.5
13-24	288	56.5
≥25	102	20.0
Gestational age at time of interview (weeks)		
≤24	69	13.6
25-34	366	72.2
≥35	72	14.2
Awareness of danger signs		
Poor	63	13.3
Fair	48	10.1
Good	96	20.3
Very good	267	56.3

Table 3: Analysis of quality of health education heard on key danger signs during pregnancy

	Yes	No	Not sure	Total
Key danger signs				
Bleeding per vagina	390 (76.0)	111 (21.7)	12 (2.3)	513
Severe abdominal pain	369 (71.5)	135 (26.2)	12 (2.3)	516
Convulsion/loss of consciousness	318 (62.0)	165 (32.2)	30 (5.8)	513
Labor pain before 37 weeks	324 (64.3)	147 (29.2)	33 (6.5)	504
Drainage of liquor	309 (61.3)	168 (33.3)	27 (5.4)	504
Fever	408 (78.6)	93 (17.9)	18 (3.5)	519
Severe headache/blurring of vision	357 (70.0)	138 (27.1)	15 (2.9)	510
Non-key danger signs				
Frequent movement of the fetus	243 (48.8)	228 (45.8)	27 (5.4)	498
Diarrhea	273 (54.5)	201 (40.1)	27 (5.4)	501
Verbal attack by your enemy	120 (25.0)	327 (68.1)	33 (6.9)	480
Excessive sleep	129 (25.6)	336 (66.7)	39 (7.7)	504
Difficulty in breathing	279 (54.4)	222 (43.3)	12 (2.3)	513

Table 4: Relationship between knowledge score of key danger signs and selected characteristics

Variable	Knowledge of key danger signs			
	Good	Poor	χ^2	P
Age (years)				
Below 20	6 (100.0)	0 (0.0)	10.913	0.028
20-24	39 (81.3)	9 (18.8)		
25-29	99 (63.5)	57 (36.5)		
30-34	147 (62.0)	90 (38.0)		
Over 34	51 (70.8)	21 (29.2)		
Religion				
Christianity	237 (62.2)	144 (37.8)	4.034	0.048
Islam	99 (71.7)	39 (28.3)		
Education				
Primary	12 (66.7)	6 (33.3)	2.421	0.298
Secondary	69 (71.9)	27 (28.1)		
Tertiary	234 (63.4)	135 (36.6)		
Tribe				
Hausa	6 (66.7)	3 (33.3)	13.841	0.003
Yoruba	297 (66.4)	150 (33.6)		
Ibo	30 (62.5)	18 (37.5)		
Others	3 (20.0)	12 (80.0)		
Occupations				
Med Practitioners	51 (75.0)	17 (25.0)	23.759	0.001
Professionals	33 (82.5)	7 (17.5)		
Business/trading	87 (57.6)	64 (42.4)		
Teaching/civil servants	74 (64.3)	41 (35.7)		
Students/corpers	30 (57.7)	22 (42.3)		
Artisans	12 (48.0)	13 (52.0)		
Unemployed/housewife	46 (82.1)	10 (17.9)		
Had education on danger signs				
Yes	336 (67.1)	165 (32.9)	24.661	<0.001
No	3 (14.3)	18 (85.7)		
Not sure				
Gestation age at booking (weeks)				
≤12	78 (65.0)	42 (35.0)	0.368	0.832
13-24	192 (67.4)	93 (32.6)		
≥25	60 (64.5)	33 (35.5)		
Gestation age at interview time (weeks)				

Contd...

Table 4: Contd...

Variable	Knowledge of key danger signs			
	Good	Poor	χ^2	P
≤24	39 (56.5)	30 (43.5)	5.458	0.065
25-36	237 (66.9)	117 (33.1)		
≥35	54 (75.0)	18 (25.0)		

25–29 years, 62.0% among those aged 30–34 years, and 51% of over 34 years (P = 0.028). Proportion of respondents having good knowledge was 62.2% and 71.7% among those practicing Christianity and Islam, respectively (P = 0.048). For highest education obtained, proportion of those with good knowledge was 66.7%, 71.9%, and 63.4% for those who had up to primary education, secondary education, and a tertiary education, respectively (P = 0.298).

About three-fifths (61.5%) of the respondents who attended the ANC for up to 12 weeks had good knowledge about KDSP while 74.3% for those who had 13–24 weeks attendance and 71.4% for those who attended for more than 24 weeks (P = 0.013). Furthermore, proportion of respondents having good knowledge about KDSP was 61.9%, 83.3%, and 88.9% among those that attended sessions on education for up to 12 weeks, 13–24 weeks and more than 24 weeks, respectively (P = 0.004). About two-third (67.1%) of respondents who had education on danger signs in pregnancy had good knowledge), while the majority (85.7%) of those who didn't have the training had poor knowledge [Table 4].

Discussion

This study evaluated correct knowledge of KDSP among ANC attendees in a Nigerian tertiary healthcare setting. The commonly mentioned KDSP were bleeding per vaginam, severe abdominal pain, severe headache/blurring of vision, and fever as more than 70% recognized them. Although the KDSP mentioned were similar to other previous studies in Africa, but most of them reported lower proportions of those that correctly identified each of these signs.[5,9] The possible reason for the higher proportion in this study could be due to any of the followings. First, unlike other studies that were conducted in the community, this study was conducted at a tertiary health facility where health education is a routine component of ANC. Second, most of the respondents had a tertiary education. Interestingly, some respondents in this study mentioned "verbal attack by enemy" and "excessive sleep" as danger signs in pregnancy. This misconception suggests the need for more education on KDSP to dispel any negative effect on pregnancy outcome.

Regarding the score of KDSP, about 76.6% of respondents had good knowledge score. Further analysis showed that younger age, religion, occupation, and having attended a session where danger signs were discussed were associated

with good knowledge score of KDSP. In other similar studies, report of age and knowledge of danger signs were mixed.[9] The Tanzania study showed a better knowledge of danger signs with age with an adjusted odds ratio of about 2.5 times and one of the reason adduced to this observation is that older pregnant women are more likely to use their experience of pregnancy and childbirth.[10] On the contrary, Kabakyenga *et al.* reported better knowledge of danger signs among women that are younger in a study conducted in a rural Ugandan community.[6] This finding is similar to our result as women <25 years of age had a higher proportion of those with good knowledge of KDSP.

Expectedly, women who are professionals had a higher proportion of those with good knowledge of KDSP. This group of women are more likely to have access to maternal health instructional materials and other resources that could have informed their choice of these KDSP. Religion alone as a factor predicting better knowledge of KDSP is difficult to interpret as an explanatory variable because of several confounders, which could affect it. For instance, education and belief are difficult to tease out from each other. Second, multivariable analysis was not performed due to collinearity effect to see the independent effect observed with religion. The finding that higher proportion of those that are Muslim had good knowledge of KDSP may be circumstantial rather than a fact. More studies may be needed to further explore the effect of religion on this subject.

Attendance of health education session provides opportunity for improved knowledge, it is therefore not surprising that women that attend health education sessions had better knowledge of KDSP and this is similar to findings by several studies that attendance of ANC strongly influences their knowledge. Other factors identified elsewhere to be associated with better knowledge of KDSP include educational level, possession of mobile phones, and electronics radio and television.[14] Apart from educational attainment that was found not to be significantly associated with good knowledge score as about four of every five respondents had a tertiary education in this study, means of telecommunication and household items were not considered.

The result of this study should be interpreted with caution because of the following limitations. First, this was a cross-sectional design and this implies that causality effect of associated factor cannot be made. Second, the study was conducted among a relatively highly educated population

in a tertiary health setting. This might not be a reflection of reality in the community as majority of women do not have a tertiary level education and they may not be exposed to quality health education as it is been conducted at the study site. Third, multivariable analysis was not performed due to collinearity effect and this could limit the degree of reported association discussed. Notwithstanding, this study has several strengths. The use of knowledge score for KDSP appears to be more objective assessment and the internal reliability was good as shown by the Cronbach's alpha of 0.87. The composite scoring ensures broader assessment of KDSP, unlike other studies that draws their conclusion from the individual sign. Furthermore, the use of Likert scale for assessment of knowledge as "not sure" response is different from those that choose absolute "no".

In conclusion, the correct knowledge of KSDP appear to be better among women interviewed as danger signs for most of the common causes of maternal mortality were mentioned. We recommend that health education should focus on KDSP and its significance to antenatal women while also paying attention to any sociocultural misconceptions and taboos. Future research should focus on qualitative designs among women attending secondary and primary health care facilities to further unearth depth of knowledge on this subject in the community.

Acknowledgments

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