

# Effect of Health Education Intervention on Knowledge and Utilization of Health Facility Delivery Services by Pregnant Women in Sokoto State, Nigeria

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## ABSTRACT

**Introduction:** Although, maternal health care services have been found to improve the survival and quality of life for mothers and children, they are often underutilized by the mothers and children who are in greatest need. This study aimed to assess the effect of health education intervention on knowledge and utilization of health facility delivery services by pregnant women in Sokoto State, Nigeria.

**Material and methods:** This was a quasi- experimental study among 232 randomly selected pregnant women (with 116 each in the intervention and control groups) attending antenatal clinic in the health facilities in Sokoto State, Nigeria. A semi-structured interviewer- administered questionnaire was used to collect data on the research variables. Data were analyzed using IBM SPSS version 20 statistical package.

**Results:** The mean age of the respondents in the intervention and control groups was  $26.67 \pm 6.01$  and  $27.80 \pm 6.53$  years respectively. The proportion of participants with good knowledge of the danger signs of pregnancy and labour increased significantly ( $p < 0.05$ ) from 96.6% in both groups at baseline to 100% and 98.1% in the intervention and control groups respectively at post intervention. However, the proportion of participants that delivered in the health facility increased significantly ( $p < 0.05$ ) only in the intervention group.

**Conclusion:** This study showed that health education intervention is effective in improving knowledge and utilization of health facility delivery services among pregnant women in Sokoto State, Nigeria. Periodic education of the public is hereby suggested to promote utilization of health facilities delivery services.

**Keywords:** Health Education, Intervention on Knowledge and Utilization, Health Facility, Delivery Services by Pregnant Women

## INTRODUCTION

Utilization of maternal health services has been identified as an important factor determining maternal, infant and child morbidity and mortality in a number of studies.<sup>1,2,3</sup>

In fact, skilled attendance at birth has been identified as the single most important factor in preventing maternal deaths and most important element in reducing neonatal deaths.<sup>2,3</sup>

Globally, maternal mortality ratios present the largest discrepancy in any public health statistics between developed and developing nations.<sup>4</sup> Africa has the highest burden in the world and sub-Saharan Africa is largely responsible for the dismal maternal deaths figure, contributing approximately 98% of maternal deaths.<sup>4</sup> An estimated 99% of pregnant

women in developed countries use skilled obstetric care, compared to 53% of their developing countries counterparts.<sup>4</sup> Nigeria is among the worst in the world, and contributes approximately 10% of the global burden of maternal and child deaths.<sup>5</sup> There is a very huge risk differential among pregnant women in developing countries and industrialized countries.<sup>6</sup> The very low maternal/infant mortality and morbidity rates reported in developed countries compared to developing countries have been attributed to the higher utilization of modern obstetrics services in the developed countries.<sup>7</sup> The situation in Northern Nigeria where the maternal mortality is much higher than the national average is a particular cause of concern.<sup>8</sup>

Utilization of maternal delivery services continues to be sub optimal in sub-Saharan Africa with wide variations within and across the countries.<sup>9</sup>

In Nigeria only 34% of pregnant women have access to skilled attendance during delivery.<sup>8</sup>

The proportion of the pregnant women utilizing delivery services in the study area was estimated at 32%.<sup>10</sup>

The key to reducing maternal mortality ratio and improving maternal health is increasing attendance by skilled health personnel throughout pregnancy and delivery.<sup>12</sup> Accessibility to health facilities and services in terms of distance, poor or lack of Ante-Natal Care (ANC) and delay in presentation to the hospital were among the risk factors leading to high maternal mortality in the study area.<sup>13</sup>

A survey carried-out in Northern Nigerian States of Katsina, Yobe and Zamfara to assess the use of antenatal service and delivery care among 6,924 pregnant women attending ANC, it was found that most of the women (90.7%) delivered at home.<sup>7</sup>

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Another study conducted in Gidan Igwe, Sokoto, Sokoto state Nigeria among women of child bearing age to assess the determinants of utilization of maternity services, observed that of the 300 respondents 190 (67.3%) had their last delivery at home.<sup>10</sup>

A cross-sectional study conducted in north Western Ethiopia among 314 mothers who gave birth in the last 12 months in Sekele district, reported a very low (12.1%) institutional delivery, it was also found that knowledge of the mother on pregnancy and delivery was significantly associated with institutional delivery utilization ( $p < 0.05$ ).<sup>11</sup>

Another study carried-out in southern Tanzania to assess use of maternal health services and determinants of skilled care delivery, reported that among the 914 respondents, the proportion of women who enjoyed skilled care at delivery increased with respondents' knowledge of danger signs of pregnancy and delivery from 39% to 68%.<sup>13</sup>

A survey conducted among 7005 women to assess the possible factors contributing to women obtaining antenatal care service and to determine whether these services influenced their decision regarding the place of delivery, in 14 states in rural areas of India found that awareness of care during pregnancy and knowledge of pregnancy related complications were associated with increased utilization of antenatal care services and place of delivery.<sup>14</sup>

In a study to determine the effect of health education intervention on utilization of maternal and child health services, among 257 women of reproductive age in Pa-oh villages, Shan State, Myanmar, reported positive changes in knowledge, attitude and practice of utilization of antenatal, delivery and postnatal services following the health education intervention.<sup>15</sup>

In another study to assess the impact of community -based interventions (that included health education) on maternal and neonatal health indicators among 4,000 pregnant women in rural Balochistan, Pakistan, it was reported that proportion of women delivering in the district hospital after the intervention was higher in the intervention group compared with the control group 28.0% to 46.8% ( $p < 0.05$ ).<sup>16</sup>

A similar study carried-out to assess the effect of participatory intervention (including health education intervention and action learning) on birth outcomes among women groups in Makwampur district, Nepal, It was reported that, women in the intervention cluster were more likely to have antenatal care, institutional delivery and hygiene care as compared to the women in the control group.<sup>17</sup>

This study aimed to assess the effect of health education intervention on knowledge and utilization of health facility delivery services by pregnant women in Sokoto State, Nigeria.

## MATERIAL AND METHODS

This was a quasi- experimental study design among 232 randomly selected pregnant women with gestational age of 6 months and above (with 116 each in the intervention and control groups) attending ante-natal clinic in the health facilities in Sokoto State, Nigeria. The study was conducted

in 3 of the 23 Local Government Areas (LGAs) of Sokoto state. Sokoto state has a land mass of 25,972 km<sup>2</sup> and an estimated population of 4,802,298 projected for 2015 based on the 2006 census.<sup>8</sup> The state is divided into three health zones (East, West, and Central), and there are 714 health facilities.

### Scoring and Grading of Participants Knowledge of Danger signs of Pregnancy and Labour

Each correct response was allocated 1 mark while wrong or no response was scored zero.

Greater or equal to 50% score for knowledge was considered as good knowledge and less than 50% score on knowledge was considered as poor knowledge. The total score was determined by calculating the total correct responses divided by the total number of expected correct responses multiplied by one hundred. Knowledge of danger signs of pregnancy was scored and converted into categorical variables (good and poor knowledge). Chi- square test was used to test for statistical significance.

### Sample size estimation and Sampling Technique

The sample size was estimated at 116 per group using statistical formula for calculating sample size for intervention studies to compare proportions in 2 independent groups (intervention and control) with pre and posttest.<sup>18</sup> a 65% prevalence of knowledge of utilization of delivery services among pregnant women from a previous study,<sup>5</sup> a precision level of 5% and an anticipated response rate of 90%.

The eligible participants were selected by a multistage sampling technique.

At first stage one LGA was selected in each of the 3 health zones (i.e., 3LGAs) for the intervention group by simple random sampling, using the balloting procedure; likewise one LGA was selected in each of the 3 health zones (i.e., 3 LGAs) for the control group, making a total of 6 LGAs (3 for intervention and 3 for control).

A list of all the health facilities in the selected LGAs was obtained from Sokoto State Ministry of Health, and at the second stage, three health facilities were selected from each of the selected intervention and control groups LGAs by simple random sampling. At the third stage, eligible study participants were selected by systematic sampling technique using the ANC's attendance list in the selected health facilities to constitute the sampling frame and proportionate allocation based on the total number of client flow was used in the selection of study participants in the selected health facilities.

### Data Collection

A semi-structured, interviewer-administered questionnaire was developed and used to obtain information on participants' socio-demographic characteristics, knowledge of danger signs of pregnancy and utilization of delivery services (at baseline and at post-intervention). It was reviewed by researchers in the Department of Community Health, Usmanu Danfodiyo University, Sokoto, Nigeria. Corrections were made based on their inputs on content validity. The questionnaire was pretested on 20 pregnant women who

were 6 month pregnant and attending ANC in Kware and Shagari LGAs that were not selected for the study.

The post intervention data was collected 12 weeks after the first health education session from the same participants during delivery at the respective health facilities where the study was conducted. Those that did not delivered in the health facility were followed down to their houses and the same questionnaire was administered to obtained information on delivery.

Approval for the study was obtained from the Ethical Committee of the Usmanu Danfodiyo University Teaching Hospital Sokoto. Permission to carry out the study was sought from the State Ministry of Health, Sokoto and the respective LGAs' authorities. Written informed consent was also obtained from the study participants.

### Procedure of Health education Intervention

The health education intervention comprised of health talks and role play. Two sessions of health talk (reinforced with wall mounted posters and hand bills) were given to the intervention group participants and they were focused on relevant topics of delivery services utilization such as: meaning of health facility delivery services; advantages of utilizing health facility delivery services; and dangers of non- utilization of health facility delivery services, and its consequences on the lives of the mother and the baby.

The first session of health talk was held immediately after the pre intervention data collection. Each session lasted for one hour, out of which 45 minutes were allocated for the lecture which was didactic in nature and 15 minutes were allocated for questions and answers. Following the lectures, some of the participants were selected to perform role play so as to demonstrate the importance of utilization of health facility delivery services and the consequences of the non- utilization of the services as well as where and when to access such services. This was done to re-enforce the information given to them and enable them internalize it. The participants were also exposed to posters and hand bills to reinforce the health education message.

Four weeks after first health education lectures, the second health education session was held to re-inforce the information given to them at the first health education session

### STATISTICAL ANALYSIS

Data were analyzed using IBM SPSS version 20 computer statistical software package. The Chi-square test was used for bivariate analysis involving categorical variables. All levels of significance were set at  $P < 0.05$ .

### RESULT

#### Socio-demographic Characteristics of Respondents

All the questionnaires administered to both the intervention and control group participants at baseline were adequately completed and found suitable for analysis, giving a response rate of 100%

The mean age of the respondents was  $26.67 \pm 6.01$  years and  $27.80 \pm 6.53$  years for intervention and control groups respectively and majority (33% and 29%) were aged 25-29

Variables	Intervention Group n=116 (Number(%))	Control Group n=116 (Number(%))	Test Statistics & P-value
<b>Age</b>			
15 – 19	11 (9.5)	13 (11.2)	$\chi^2 = 21.26$ $p = 0.879$
20 – 24	33 (28.4)	22 (19.0)	
25 – 29	38 (32.8)	34 (29.3)	
30 – 34	24 (20.7)	27 (23.3)	
35 – 39	3 (2.6)	11 (9.5)	
40 – 44	6 (5.2)	0 (0)	
45 – 49	1 (0.9)	9 (7.8)	
Mean age $\pm$ SD	$26.66 \pm 6.01$	$27.80 \pm 6.52$	
<b>Religion</b>			
Islam	105 (90.5)	106 (91.4)	$p = 0.241$
Christianity	11 (9.5)	10 (8.6)	
<b>Ethnic Group</b>			
Hausa/Fulani	84 (72.4)	84 (72.4)	$\chi^2 = 11.49$ $p = 0.243$
Yoruba	12 (10.3)	11 (9.5)	
Igbo	8 (6.9)	7 (6.0)	
Others	12 (10.3)	14 (12.1)	
<b>Marital Status</b>			
Single	1 (0.9)	1 (0.9)	$\chi^2 = 116$ $p = 0.0001$
Married	113 (97.4)	115 (99.1)	
Divorced	1 (0.9)	0 (0)	
Widow	0 (0)	0 (0)	
Separated	1 (0.9)	0 (0)	
<b>Occupation</b>			
House wives	86 (74.1)	87 (75.0)	$\chi^2 = 405.152$ $p = 0.0001$
Farmer	3 (2.6)	3 (2.6)	
Petty Trader	15 (12.9)	11 (9.5)	
Civil Servant	10 (8.6)	13 (11.2)	
Others	2 (1.7)	2 (1.7)	
<b>Educational Status</b>			
None	6 (5.2)	3 (2.6)	$\chi^2 = 177.78$ $p = 0.000$
Qur'anic	67 (57.8)	44 (37.9)	
Primary	14 (12.1)	32 (27.6)	
Secondary	24 (20.7)	30 (25.9)	
Tertiary	5 (4.3)	7 (6.0)	

**Table-1:** Socio-demographic characteristics of participants

years. The most predominant religion was Islam (90.5% and 91.4%) for both intervention and control groups respectively. A large proportion were married (97.4% and 99.1%) both intervention and control groups. Most of the respondents in both intervention and control groups had Qur'anic education (57.8% and 37.9%) respectively. A larger proportion (74.1% and 75.0%) of the respondents in both study and control were house wives while civil servants constituted only 8.6% and 11.2% for intervention and control groups respectively (Table 1). Furthermore, a larger proportion of the participants (52.7% and 45.7%) of intervention and control groups respectively were Multipara (had between 2-4 deliveries) as shown in Figure 1.

#### Effect of intervention on participant' knowledge of danger signs of pregnancy

There was an increase in the proportion of the respondents in the intervention group who identified vaginal bleeding during pregnancy as a danger sign of pregnancy from 96.6% to 100% at pre and post interventions respectively.



Variables	Intervention group		Control group	
	Pre intervention (n = 116) Number (%)	Post intervention (n = 110) Number (%)	Beginning of study (n = 116) Number (%)	End of study (n = 108) Number (%)
Vaginal bleeding during pregnancy	112 (96.6)	110 (100)	112 (96.6)	101 (98.1)
Severe headache during pregnancy	62 (53.4)	97 (88.2)	65 (56.0)	61 (56.5)
Seizures while pregnant	110 (94.8)	110 (100)	112 (96.4)	100 (97.1)
Decrease or absent of foetal movement	89 (76.7)	102 (92.7)	88 (75.9)	85 (78.7)
Swelling of legs	63 (54.3)	100 (90.9)	58 (50.0)	62 (57.4)

**Table-2:** Effect of intervention on participants' knowledge of danger signs of pregnancy

Variables	Intervention group		Control group	
	Pre intervention (n = 116) Number (%)	Post intervention (n = 110) Number (%)	Beginning of study (n = 116) Number (%)	End of study (n = 108) Number (%)
Labour lasting for more than 12hours	85(73.3)	87 (79.1)	83 (71.6)	78(72.2)
Excessive bleeding after delivery	112 (96.6)	110 (100)	114 (98.3)	106(98.1)
Any part of the baby showing during labour other than the head	100 (86.3)	97 (88.1)	106 (91.4)	97 (89.8)

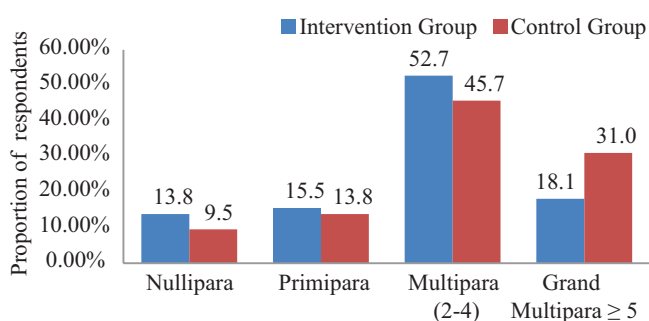
**Table-3:** Effect of intervention on participants' knowledge of danger signs of labour

Variable	Intervention group		Control group	
	Pre intervention (n = 116) Number (%)	Post intervention (n = 110) Number(%)	Beginning of study (n = 116) Number(%)	End of study (n = 108) Number(%)
	Good	Poor	Good	Poor
Beginning of study	112 (96.6)	4 (3.4)	112 (96.6)	4 (3.4)
End of study	110 (100)	0 (0)	106 (98.1)	2 (1.9)

**Table-4:** Effect of intervention on participants' knowledge of various aspects of danger signs of pregnancy and labour

Variables	Intervention group		Control group	
	Pre intervention (n = 116) Number (%)	Post intervention (n = 110) Number (%)	Beginning of study (n = 116) Number (%)	End of study (n = 108) Number (%)
Place of delivery				
Health facility	42 (42.4)	58 (53.2)	47 (48.5)	51 (47.2)
Home	57 (57.6)	51 (46.8)	50 (51.5)	57 (52.8)

**Table-5:** Effect of intervention on utilization of health facility delivery services



**Figure-1:** Parity of respondents

About 77% of the respondents in the intervention group identified decrease or absent of foetal movement as danger sign during pregnancy at pre intervention while at post intervention this increased to 93%. There was statistically significant increase between pre and post intervention phase in the intervention group (Fisher exact,  $\chi^2 = 97.022$ ,  $p < 0.001$ ).

In the intervention group, the proportion of respondents who

knew legs swelling as a danger sign of pregnancy increased from 54% at pre intervention to 91% at post intervention. The increase was statistically significant ( $p < 0.001$ ).

There was a statistically significant increase in the proportion of the respondents in the intervention group who identified severe headache as danger sign during pregnancy from 53.4% at pre intervention to 88.2% at post intervention ( $\chi^2 = 17.055$ ,  $p < 0.001$ ).

At pre intervention 94.8% of respondents identified seizure during pregnant as a danger sign of pregnancy while at post intervention, all of them (100%) identified it as a danger sign of pregnancy (Table 2).

**Effect of intervention on participants' knowledge of danger signs of labour**

There was a statistically significant ( $p < 0.05$ ) increase in the proportion of the respondents in the intervention group who identified labour lasting for more than 12hours as a danger sign of labour from 73.3% at pre intervention to 79.1% post intervention.

There was also a statistically significant ( $p < 0.001$ ) increase in the proportion of respondents in the intervention group who identified any part of the fetal body other than head showing during labour as a danger sign from 86.3% at pre intervention to 88.1% post intervention.

In the intervention group the proportion of those who knew excessive bleeding after delivery is danger sign of pregnancy also increased from 96.6% to 100% (Table 3).

Effect of intervention on participants' knowledge of various aspects of danger signs of pregnancy and labour

There was an increase in the proportion of the respondents with good knowledge of various aspects of danger signs of pregnancy and labour from 96.6% at pre intervention to 100% at post intervention among the intervention group. There was also an observed increase in the proportion of respondents among control group who had good knowledge of various aspects of danger signs of pregnancy and labour from 96.6% at beginning of study to 98% at the end of the study ( $p < 0.001$ ) (Table 4).

#### Effect of intervention on utilization of health facility delivery services

The proportion of respondents in the intervention group that delivered at health facility increased from 42.4% at pre intervention, to 53.2% at post intervention. The observed increase was statistically significant ( $p < 0.001$ ) (Table 5).

## DISCUSSION

Majority (32.8% and 29.3%) of the respondents in the intervention and control groups were aged 20 to 29 years and a mean age of  $26.6 \pm 6.0$  years, is in consonance to the finding of the study conducted in Gidan Igwe, Sokoto, Nigeria in which majority of the respondents had a mean age of  $27 \pm 6.0$  years.<sup>11</sup>

The preponderance of Muslims among the respondents in this study could be due to the fact that Islam is the predominant religion in northern Nigeria, and the religious/cultural practices that prohibit giving birth outside wedlock in the study area could be the reason why most of the respondents in the intervention and control groups (97.4% and 99.1%) were married.

This finding is closely related to a study conducted in Sagamu, South western Nigeria where the majority of the respondents (79%) were married<sup>20</sup> but contrast to a study conducted in Eretria where the majority of the respondents (66.0%) were unmarried,<sup>21</sup> and also in contrast to another study conducted in Mongomo, Guinea Equatorial where also larger proportion of the respondents (60%) were unmarried.<sup>22</sup> The finding of a larger proportion (74.1% and 75%) of the participants in the intervention and control groups respectively being full-time housewives and a smaller proportion of the respondents (8.6% and 11.2%) being civil servants could be due to the fact that majority (57.8% and 37.9%) of the participants in the intervention and control groups respectively had either Quranic education or none at all (and as such, they lack the basic requirements for recruitment into the civil service). Furthermore, this study also showed that larger proportion of the participants

(52.7% and 45.7%) in the intervention and control groups respectively were Multipara (had between 2-4 deliveries).

In this study majority (96.6%) of the respondents in both the intervention and control groups who delivered in health facilities had good knowledge of danger signs of pregnancy and labour, the high score in knowledge is not surprising as the study was conducted in health care settings where the respondents came for ANC. This is commensurate with the finding in a study conducted in south-Western Ethiopia which reported 90.2% good knowledge of mother on pregnancy and delivery and was significantly associated with institutional delivery utilization.<sup>12</sup> This is also in consonance with the findings of a study conducted in Matagalpa, Nicara, which reported that 85.4% of the respondents had good knowledge on maternal health care services and delay in seeking health care during pregnancy was influenced by individual and community knowledge of maternal health services.<sup>22</sup>

In contrast to the control group, the proportion of the study participants in the intervention group who delivered in a health facility increased from 42.2% at pre intervention to 53.2% at post intervention, and the observed increase was statistically significant ( $p=0.001$ ); this shows that the health education intervention was effective in improving utilization of health facility delivery services among them. Similar to the finding in this study, a study conducted in Shan state, Myanmar, also found significant increase in utilization of ANC and delivery services following a health education intervention.<sup>16</sup> The finding in this study is also in agreement with the finding in a health education intervention study conducted in Balochistan, Pakistan which reported an increase in the proportion of women delivering in the district hospital after the health education intervention from 28.0% to 46.8%  $p < 0.05$ ,<sup>16</sup>

Also similar to a randomized controlled study carried-out to assess the effect of participatory intervention (including health education intervention and action learning) among women groups on birth outcomes in Makwampur district, Nepal, which reported that women in the intervention cluster were more likely to have antenatal care, institutional delivery as compared to the women in the control group.<sup>18</sup>

## CONCLUSION

This study showed high level of knowledge on utilization of health facility delivery services in both groups (96.6%), at baseline, but poor utilization of the services in both the intervention group (42.4%) and the control group (48.5%). In contrast to the control group participants, a statistically significant increase in the knowledge and utilization of health facility delivery services was recorded among the intervention group participants. These findings underscore the need for periodic and sustained education of the public through the mass media in order to promote utilization of health facilities delivery services.

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