

EFFECT OF HEALTH EDUCATION INTERVENTION ON KNOWLEDGE OF BIRTH PREPAREDNESS AMONG PREGNANT WOMEN ATTENDING PRIMARY HEALTH CARE IN ZARIA METROPOLIS

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ABSTRACT

Birth preparedness is a comprehensive strategy to improve the use of skilled providers at birth and the key intervention to decrease maternal mortality. The aim of this work was to assess the level of birth preparedness among pregnant women attending Primary Health Cares in Zaria Metropolis. A quasi experimental design was adopted. A questionnaire was administered to 160 respondents divided into two groups: (80) for the experimental group and control (80) groups. The analysis revealed that there were significant differences in the knowledge level of respondents on birth preparedness in the study group and the control group. The level of respondents who have good knowledge from the study group increased from 20 (25.0 %) before intervention to 61(76.3 %) after intervention ($P = 0.001$). The independent sample t -test on level of birth preparedness showed that the observed t -calculated (-7.586) is greater than the t -critical (1.96) at the probability level of significance of 0.001 ($P < 0.05$). Thus, we concluded that health education has an effect on pregnant women's knowledge of birth preparedness.

Keywords: birth preparedness, pregnancy, maternal mortality, health education

INTRODUCTION

Almost all maternal deaths (99%) occur in developing countries. More than half of these deaths occur in sub-Saharan Africa and almost one third occur in South Asia. Maternal death is being addressed by Millennium Development Goal 5, which aims to decrease maternal

mortality ratio by 75% by 2015 (WHO Fact Sheet, 2016). In 2012, the World Health Organization (WHO) reported that close to 10 million women suffer complications related to pregnancy or childbirth (WHO, 2012). In 2013, an estimated 289,000 women died worldwide, down from 523,000 in 1990. The number of maternal deaths decreased by 43% between 1990 and 2015. Globally, the maternal mortality ratio (maternal deaths per 100 000 live births) fell by nearly 44% over the past 25 years (WHO, 2015). But 800 women a day are still dying from complications in pregnancy and childbirth globally- equivalent to 33 an hour (*The Guardian, 2014*).

From a survey carried in 2011 and 2012 a non-governmental organization, Nigerian Urban Reproductive Health Initiative, NURHI, reported that about 1,999 women die in Kaduna State annually following complications arising from childbirth. This huge loss of life has been attributed to early-age and late-age birth, lack of child spacing and access to health care facilities among others (Premium Times, 2017). A major strategy that can reduce the maternal mortality ratio is making a birth plan or birth preparedness (Acharya, Kaur, Prasuna, and Rasheed, 2015). This is defined as a set of knowledge, behaviours and actions undertaken by women, families, communities, health care providers and facilities to enhance the survival of women and new-borns during pregnancy, childbirth and the postpartum period. It is the

advance planning and preparation for delivery in order to improve maternal health outcomes. However, the application of this concept varies and there is no single agreed upon definition (Fishel, 2001; Roxana and Barco, 2004).

Birth preparedness is a comprehensive strategy to improve the use of skilled providers at birth and the key intervention to decrease maternal mortality (JHPIEGO, 2004). Every pregnant woman is at risk of pregnancy complications which are unpredictable and can lead to morbidity or mortality of herself or her baby (JHPIEGO, 2004). Hence, the concept of birth preparedness in which the family and community should have an advanced planning and preparation is to ensure safety and well-being of the women and new born throughout pregnancy, delivery and after delivery. Skilled care before, during and after childbirth can save the lives of women and newborn babies (WHO, 2016). Good plans and preparations will increase utilization of skilled care and reduce delays in accessing care in case of pregnancy and delivery complications (Urassa, Pembe and Mganga, 2012). It encourages women, households, and communities to make arrangements such as identifying or establishing available transport, setting aside money to pay for service fees and transport, and identifying blood donor in order to facilitate swift decision-making and reduce delays in reaching care once a problem arises.

A study in Zaria Northern Nigeria showed extremely 'poor' knowledge on maternal health by women and men. Only 3% of the men and 1% of the women had 'good' knowledge and perception of maternal health, but a considerable number (44.2% men and 55.7% women) 'fair' knowledge (Butawa, Tukur, Idris, Adiri and Taylor, 2010). A study in Osogbo Southwest Nigeria showed that six-tenth of the women recognized complications such as massive bleeding, prolonged labour, malposition, retained placenta and very high

fever at delivery as serious that could have fatal outcomes. One-tenth attached, no seriousness to vaginal bleeding during delivery.

In Nigeria, the education of a mother is shown to strongly affect the type of antenatal care provider, type of person providing assistance during delivery, access to health care facilities among other health indicators (Health Reform Foundation of Nigeria, 2006). The level of education is positively associated with the knowledge of birth preparedness and danger signs. This may be explained by the fact that there is the possibility that education exposes pregnant women to lots of information (Ibrahim, Owoeye and Wagbatsoma, 2013). The study was aimed to assess the knowledge of birth preparedness among pregnant women attending Primary Health Care centres in Zaria.

METHODOLOGY

This study employed a quasi-experimental design with pre and post intervention components. The effect of a health education intervention on knowledge of birth preparedness among pregnant women attending Primary Health Care Centers in Zaria metropolis was assessed. **Zaria** (latitudes 11°1'30" to 11°13'30"N and longitudes 7°36'0" to 7°46'30"E) covers an area extent of 6100 hectares with a population of approximately 992,958 as at year 2017 according to Population City (<http://population.city/nigeria/zaria/>). Zaria Local Government Area has 13 political wards. The Local Government area has a secondary health facility, 16 primary health care centres and 29 health posts which all offer maternal and child health (MCH) services. Sabongari Local Government area on the other hand has 8 political wards, a secondary health facility, 16 primary health care centres and 12 health posts which all offer maternal and child health (MCH) services. This information was obtained from monitoring and evaluation unit

of the department of health in the two local government areas respectively.

The study population comprised of pregnant women of reproductive age (15 – 49 years) who are in their third trimester and are residents of Zaria metropolis, Zaria and Sabon Gari Local Government. The minimum sample size was determined using the formula for comparing two proportion according to Robert (1997):

$$n = \frac{D[Z_{\alpha} + Z_{\beta}]^2 \times [(P_1 \times (1 - P_1)) + (P_2 \times (1 - P_2))]}{(P_2 - P_1)^2}$$

Where

n = required minimum sample size per comparison group

D = design effect (assuming in the following questions to be 2)

Z_{α} = Z score corresponding to 95% level of significance i.e. 1.96

Z_{β} = Z score corresponding to 80% statistical power of the study i.e. 0.84

P_1 = estimated level of birth preparedness of obstetric danger signs from a previous study 17% (Hailu *et al.*, 2010)

P_2 = estimated level of birth preparedness of obstetric danger signs at the end of the study 37%

A total of 160 pregnant women were recruited in the study (80 for intervention group and 80 for control group). The inclusion Criteria: Pregnant women who are within the third trimester and are willing to participate while the exclusion Criteria: Pregnant women who are in first and second trimester. Multistage sampling technique was employed, the study Local Government Areas (LGAs): Zaria and Sabon Gari were purposively selected. Stage I - Selection of wards: using simple random sampling by balloting; two (2) wards each were selected from the two LGAs: Sabon Gari LGA: Jushi and Samaru wards and Zaria LGA: Tundunwada and Kwarbai A wards. Stage II – Selection of health facilities: one primary health care facility was selected randomly from each of the randomly selected wards: Primary Health Care Babandodo, Primary Health Care Tundunwada, Primary Health Care Jushi and Primary Health Care Samaru. Stage III - Selection of pregnant women: from each of the randomly selected primary health care facilities, 40 pregnant women (20 each for control and intervention groups) were randomly selected, making a total of 160 women.

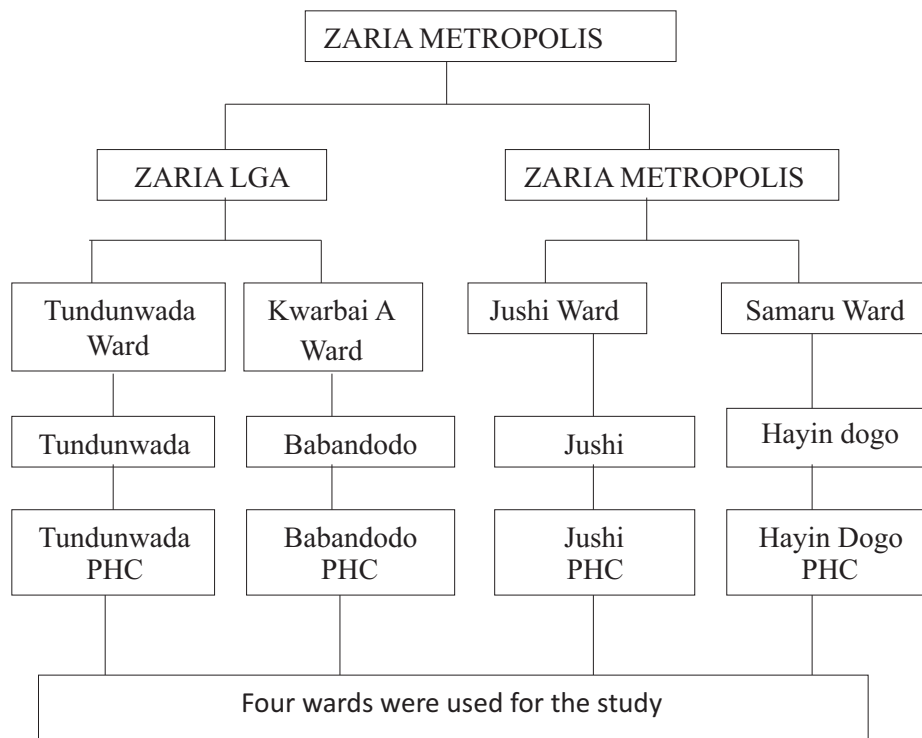


Figure 1: Selection of PHCs from the four wards

Source: authors conceptualisation

Semi-structured adopted modified safe motherhood questionnaire from John Hopkins programme for International Education in Gynaecology and Obstetrics (JHIPEGO, 2004). The questionnaire composed of two (2) sections A and B. Section A: socio-demographic section collected data regarding socio-demographic characteristics. While section B: level of mother's knowledge regarding birth preparedness. Knowledge score on birth preparedness comprises of ten (10) questions. A score of < 40% translates to poor knowledge, 41-59% average knowledge and > 60% as having good knowledge on birth preparedness.

Validity of Instrument. Advocacy visit and meeting with the persons in charge of selected primary health care centres in Zaria metropolis was carried out by the researcher for self-introduction and explanation on the study objectives. One research assistant from each

of the selected primary health care centres were selected by the researcher to assist in the data collection process. The research assistants were taken through the objectives and methodology of the study. They were exposed to practical experiment, conducting interviews and pre-testing the questionnaire. The researcher and the assistants administered the pre-questionnaire to the literate pregnant mothers to answer, while questionnaire was interpreted to the illiterate mothers. The questionnaire was administered to them by face to face interviews after explanation and interpretation they were given opportunity to answer the questions appropriately before the intervention. The pregnant women in the study group were asked to return back for the intervention after four weeks. Their names, phone numbers and home address were collected for contact.

Intervention

The health education intervention was designed based on component of birth preparedness. A flier was also designed which contained picture on the component of birth preparedness which serves as teaching aid guide to the pregnant woman, one health education interaction section. A single interactive session was conducted for the women in each of the four selected PHCs which lasted for a period of 40 minutes. After the session when the teaching was completed, questions and answer session were created for more clarity in place of doubt.

Post-Interventions

For administration of post questionnaire: The researcher and the assistant began a follow up call after 12 weeks of intervention. Assessment

was carried out after 12 weeks of the intervention to assess the effect of health education program on birth preparedness where the post-questionnaire was administered to the women on the various PHC centers on the immunization clinic days, those that were not available were followed up in their residential places respectively. Level of knowledge on obstetric danger signs in pregnancy was scored before and after intervention for the study group as follows: Above 60% good knowledge, 50% to 59% average while less than 50% was scored as poor (WHO, 2015). Data obtained were analysed using descriptive statistics (frequency, percentages, mean, an standard deviation) and hypothesis was tested using t-test. Chi-square was used to test homogeneity of the control and invention group with p value at 0.05, ANOVA test was also used.

RESULTS

Table 1: Distribution of groups and socio-demographic data

	Study				Control			
	Frequency	%	X ²	P value		X ²	P value	
Age group (years)								
15-24	26	32.5			29	36.2		
25-34	42	52.5			40	50		
35-44	8	10			7	8.8		
45 and above	4	5			4	5		
Religion								
Islam	53	66.3	8.450	0.006	50	62.5	5.000	0.025
Christianity	27	33.7			30	37.5		
Level of Education								
Informal	21	26.3			22	27.5		
Primary	15	18.7	11.700	0.008	17	21.3	11.700	0.008
Secondary	32	40			31	38.7		
Tertiary	12	15			10	12.5		
Occupation								
Housewife	25	31.2			27	33.7		
Petty trader	19	23.7			19	23.7		
Student	11	13.8	8.750	0.068	10	12.5	12.500	0.054
Civil servant	13	16.3			13	16.5		
Others	12	15			11	13.8		
Marital status								
Single	23	28.7			20	25		
Married	54	67.5	49.525	0.000	56	70	53.200	0.000
Widow	3	3.8			4	5		
Ethnic group								
Hausa/Fulani	39	48.7			38	47.5		
Yoruba	13	16.3	25.700	0.000	12	15	23.500	0.000
Igbo	10	12.5			11	13.8		
Others	18	22.5			19	23.7		
Parity								
0-1	22	27.5			22	27.5		
2-3	47	58.7	25.525	0.000	58.7	29.4	25.525	0.000
4 and above	11	13.8			11	13.8		

From Table 1, the age group 25 – 34 accounts for the majority of the respondents (52.5%). About a quarter (26.3%) have informal

education while others have attained one level of formal education, 31.2% were housewives and about 67.5% were married.

Table 2: Distribution of groups by level of knowledge of birth preparedness before intervention.

Statement	Study group n = 80						Control group n = 80					
	< 40% Poor knowledge		41-59% Averaged knowledge		> 60% Good Knowledge		< 40% Poor Knowledge		41-59% Averaged knowledge		> 60% Good knowledge	
	F	%	F	%	F	%	F	%	F	%	F	%
Birth preparedness should start as soon as pregnancy is diagnosed	36	45	23	28.7	21	26.3	41	51.2	21	26.2	18	22.6
Birth preparedness should start 3 months before delivery	30	37.5	27	33.7	23	28.7	28	35	30	37.5	22	27.5
Birth preparedness should start few weeks before delivery	33	41.2	26	32.5	21	26.3	35	43.7	25	31.2	20	25
Identification of transport is part of birth preparedness	62	77.5	18	22.5	10	12.5	41	51.2	27	33.7	12	15
Identification of blood donor is part of birth preparedness	49	61.2	19	33.7	12	15	48	60	21	26.2	11	13.7
Identification of health facility is part of birth preparedness	22	27.5	32	40	26	32.5	18	22.5	37	46.2	25	31.2
Birth preparedness entails saving money for delivery	37	46.5	27	33.7	16	20	35	43.7	28	35	17	21.2
There is need to identify who will escort you to skilled care	19	23.7	21	26.2	40	50	16	20	26	32.5	38	47.5
Birth preparedness entails preparing clean items for birth	22	27.5	29	36.2	29	36.3	19	23.7	24	30	31	38.7
Substantial amount of money should be saved in preparation of birth	53	66.2	16	20	11	13.7	52	65	19	23.7	9	11.2

Table 3: Distribution of group by level of knowledge for birth preparedness before and after intervention.

Statement	Before intervention n= 80						After intervention n= 80					
	< 40% Poor knowledge		41-59% Averaged knowledge		> 60% Good Knowledge		< 40% Poor Knowledge		41-59% Averaged knowledge		> 60% Good knowledge	
	F	%	F	%	F	%	F	%	F	%	F	%
Birth preparedness should start as soon as pregnancy is diagnosed	36	45	23	28.7	21	26.3	9	11.2	13	16.3	58	72.5
Birth preparedness should start 3 months before delivery	30	37.5	27	33.7	23	28.7	6	7.5	9	11.3	68	81
Birth preparedness should start few weeks before delivery	33	41.2	26	32.5	21	26.3	7	8.7	13	16.3	60	75
Identification of transport is part of birth preparedness	62	77.5	18	22.5	10	12.5	9	11.2	3	3.8	68	85
Identification of blood donor is part of birth preparedness	49	61.2	19	33.7	12	15	5	6.2	12	15	63	78.8
Identification of health facility is part of birth preparedness	22	27.5	32	40	26	32.5	5	6.3	8	10	67	83.7
Birth preparedness entails saving money for delivery	37	46.5	27	33.7	16	20	12	15	14	17.5	54	67.5
There is need to identify who will escort you to skilled care	19	23.7	21	26.2	40	50	2	2.5	11	13.8	67	83.7
Birth preparedness entails preparing clean items for birth	22	27.5	29	36.2	29	36.3	4	5	18	22.5	58	72.5
Substantial amount of money should be saved in preparation of birth	53	66.2	16	20	11	13.7	12	15	18	22.5	50	62.5

Table 4: Distribution of groups by level of knowledge for birth preparedness After intervention

Statement	study group n = 80						Control n = 80					
	< 40% Poor Knowledge		41-59% Averaged knowledge		> 60% Good Knowledge		< 40% Poor Knowledge		41-59% Averaged knowledge		> 60% Good knowledge	
	F	%	F	%	F	%	F	%	F	%	F	%
Birth preparedness should start as soon as pregnancy is diagnosed	9	11.2	13	16.3	58	72.5	41	51.2	21	26.2	18	22.6
Birth preparedness should start 3 months before delivery	6	7.5	9	11.3	68	81	28	35	30	37.5	22	27.5
Birth preparedness should start few weeks to delivery	7	8.7	13	16.3	60	75	35	43.7	25	31.2	20	25
Identification of transport is part of birth preparedness	9	11.2	3	3.8	68	85	41	51.2	27	33.7	12	15
Identification of blood donor is part of birth preparedness	5	6.2	12	15	63	78.8	48	60	21	26.2	11	13.7
Identification of health facility is part of birth preparedness	5	6.3	8	10	67	83.7	18	22.5	37	46.2	25	31.2
Birth preparedness entails saving money for delivery	12	15	14	17.5	54	67.5	35	43.7	28	35	17	21.2
There is need to identify who will escort you to skilled care	2	2.5	11	13.8	67	83.7	16	20	26	32.5	38	47.5
Birth preparedness entails preparing clean items for birth	4	5	18	22.5	58	72.5	19	23.7	24	30	31	38.7
Substantial amount of money should be saved in preparation of birth	12	15	18	22.5	50	62.5	52	65	19	23.7	9	11.2

Table 5: Difference mean levels of knowledge in both control and experimental groups on birth preparedness before intervention.

Level of knowledge	Study group n = 80				Control group n = 80				t	P	df
	F	%	Mean	SD	F	%	Mean	SD			
Poor	36	45	45.8	± 17.4	33	41.2	45.9	± 17.4	.011	0.991*	79
Average	24	30			26	33.8					
Good	20	25			20	25					
* Not sig		Mean 45.8		S.D ± 17.4		Mean 45.9		S.D ± 7.4			

From the analysis on Table 5, majority of the respondents from both the study and control groups had poor knowledge on birth preparedness as represented by 36(45%) and 33(41.2%) before intervention. Also, 24(30%) for study group and 27(33.8%) control group had average knowledge and 20(25%) and

20(25%) having good knowledge before intervention. The analysis from the table showed that there was no statistically significant differences in the level of knowledge as regards to birth preparedness from both the study group and the control group before intervention (p value = 0.99).

Table 6: Knowledge on birth preparedness before and after intervention

Level of knowledge	Study group Before n = 80				Study group After n = 80				T	P	df
	F	%	Mean	SD	F	%	Mean	SD			
Poor	36	45	45.8	± 17.4	7	8.7	63.8	± 11.9	-9.738	0.001	79
Average	24	30			12	15					
Good	20	25			61	76.3					
F = Frequency			Mean 45.8. S.D ± 17.4				Mean 63.8. S.D ± 11.9				

There was a notable improvement on the knowledge of respondents on birth preparedness as represented by 36(45%) having poor knowledge before intervention and 61(76.3%) having adequate knowledge

after intervention (Table 6). 24(30%) had average knowledge before intervention and 12(15%) had average knowledge after intervention (p value 0.001).

Table 7: Independent t-test of birth Preparedness before and after intervention (treatment group)

variables	N	Mean	SD	t-cal	df	P
Knowledge on Birth preparedness (Before)	80	45.87	17.43			
				-7.586	158	0.001
Knowledge on Birth preparedness (After)	80	63.80	11.95			

*significant at 0.05 level; critical t-value 1.96

Table 7 revealed that health education has effect on pregnant women's knowledge towards birth preparedness. Therefore, the null hypothesis that health education programme

does not have effect on pregnant women's knowledge towards birth preparedness was rejected (P=0.001)

Table 8: Independent t-test of birth preparedness pre and post test (control group)

variables	N	Mean	SD	t-cal	df	P
Knowledge on Birth preparedness (Before)	80	45.88	17.47			
				-0.687	158	0.493
Knowledge on Birth preparedness (After).	80	47.73	16.57			

*significant at 0.05 level; critical t-value 1.96

Table 8 revealed that there is no significant difference in the level of knowledge of pregnant women towards birth preparedness during pregnancy (P=0.493).

DISCUSSION OF FINDINGS

From the sociodemographic characteristics majority 90% of the respondents were within 14-44 years of age. This was predictable because most women marry at this age and would like to have babies during this period in life to continue their generation. Despite the warning on the risk of maternal death for mothers with age range of 11-20 years, low income communities especially in Nigeria still practice teenage marriage. These findings are consistent with the study (Markos and Bogale, 2014) who found that older women were more likely to seek maternal healthcare than younger women. Similarly, in Nigeria, women in the middle child bearing ages were more likely to use maternal health services than women in early and late child bearing.

in relation to the level of education 80% were between the primary level to tertiary level with the remaining 19% had informal education. It is revealed that women who had at least primary education are more likely to be prepared for birth and its complications

compared to those who did not. These findings have also been observed in the study conducted in Mpwapwa district Tanzania, rural Uganda, North Ethiopia and Indore City India (Agarwal *et al.*, 2010). This might be due to the fact that educated women knows the importance of planning for birth, adhere to counseling provided at antenatal care, and also have the capability of making decisions on issues related to their health. Also, a study done in Arizone central Ethiopia indicated that women who had no formal schooling are found to attend antenatal care less likely (Muhammedawel and Mesfin, 2013). It is obvious that more educated mothers tend to have better awareness on warning signs of obstetric complications. It also might be related to the fact that educated women have better power to make their own decision in matters related to their health.

From the study, it was found that women with parity range of 2-3 were 57.1%. This could be attributed to the fact that women with more children are more likely to prepare for birth and its complication than primiparous women (first time delivery). In typical Nigerian societies, cultural beliefs and lack of awareness inhibit preparation for delivery during pregnancy.

To ascertain the knowledge about birth preparedness among women attending PHCs in Zaria Metropolis. Research question two

investigated the knowledge of respondents about birth preparedness before and after intervention. There were significant differences in the mean scores before intervention mean score = 45.8 and after intervention mean score = 63.8 and $T = -9.738$ while $p = .001$ of the respondents before and after the intervention to the study group who received intervention have good knowledge of birth preparedness than those who do not receive intervention. This finding is in consonance with the study conducted by Mutiso *et al.* (2008) who reported appreciable good knowledge of birth preparedness among respondents in Nairobi after intervention. The significantly good level of knowledge translates to practice. This might suggest that health education intervention may have been responsible for the good level of knowledge on preparedness among study group.

From the findings, respondents reported that birth preparedness entails the identification of transport (85%), health facility (86.3%) and saving of money for delivery (67.5). This is consistent with the study conducted in India by Siddharth *et al.* (2010) where the knowledge on birth preparedness though they had only assessed three instead of the six aspects of birth preparedness. Deoki (2009) found a lower proportion of respondent on knowledge of birth preparedness (47.5%) in the same area of study. Almost the same knowledge of birth preparedness was found in Adrigat, Ethiopia (52%) (Mihret *et al.*, 2006).

Conclusion and Recommendations

From this study, the level of knowledge on birth preparedness reveals a remarkable difference on mean score before intervention and after intervention. Before the intervention, the pregnant women's knowledge was poor as compared to after intervention. Therefore, health education session on knowledge on birth preparedness was effective and can be used as a

measure of inculcating birth preparedness.

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