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Effectiveness of a Theory-Based Health Education on Intention to Delay Next Pregnancy using Long-Acting Contraceptives (LARC) Among Women Attending Antenatal Clinics in Katsina State, Nigeria

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Abstract

Pregnancies conceived after a short interval within less than 2 years of deliver are associated with increase health risks for both mothers and the child. A large number of women in developing countries would like to delay or stop childbearing but are not using any method of contraception due to limited choice of methods A randomized controlled trial was conducted involving 685 women attending selected antenatal clinics across Katsina State, Nigeria to determine effectiveness of a theory-based health education intervention on women's intention to delay next pregnancy using Long-Acting Reversible Contraceptives (LARC). Data was collected at baseline and six months post-intervention using a validated questionnaire. Data was analyzed using SPSS version 26. Descriptive analysis was performed first to explore the baseline characteristics of the respondents as well as to explore their socio-demographic and reproductive and obstetric history. Findings reveal significant improvements in intention to utilize LARCs post-intervention, suggesting that theory-driven education can effectively bridge the gap between knowledge and practice in contraceptive uptake. Limitations include potential self-reporting bias and loss to follow-up which might affect generalizability. However, the large sample size, rigorous methodology, and strong statistical significance enhance the reliability of the findings.

Keywords: *Antenatal Care, Contraceptive Intention, Health Belief Model Health Education, Katsina State, Long-Acting Reversible Contraceptives*

Introduction

Even though Long-Acting Reversible Contraceptives (LARCs) have been proven to be safe and efficient in preventing unintended pregnancies, their usage is still very low especially in Africa [1]. A number of multiple and complex barriers which include cost, providers' competence and knowledge have been identified to investigated for as factors resulting in the low utilization [1-3]. LARC uptake in Nigeria remains low [4] with usage rates of just 0.2% for IUDs and 2.2% for implants in Katsina State [5].

Unintended pregnancies decrease educational and career opportunities, may contribute to socioeconomic deprivation and wide disparity in income. Long-acting reversible contraception (LARC) provide opportunity to change unplanned pregnancy and parenthood to planned pregnancy or conception. LARC methods are unforgettable and once inserted provides highly effective and long-term contraception. Increasing evidence However, barriers to more widespread use of LARC methods persist and include knowledge and access [6].

Pregnancies conceived after a short interval within less than 2 years of deliver are associated with increase health risks for both mothers and the child [7]. A large number of women in

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developing countries would like to delay or stop childbearing but are not using any method of contraception due to limited choice of methods; limited access to contraception; fear or experience of side-effects; cultural or religious opposition and poor quality of available services [8]. This study evaluated the effectiveness of a Theory based health education intervention on improving intention to delay next pregnancy using LARC among women attending antenatal clinics in Katsina State.

Materials and Methods

A randomized controlled trial was conducted involving 685 women attending antenatal care in selected health facilities across Katsina State. A multi stage cluster sampling method was used with each of the primary health center serving as cluster. Participants were assigned randomly assigned to either an intervention group which received a structured theory-based health education module grounded in the HBM or a control group which received on health education on immunization and breastfeeding. Data was collected at baseline, 3 months and six months post-intervention using a validated questionnaire. The sample size for this study was calculated using the two proportions formula (Lwanga & Lemeshow, 1991) and the estimated sample size was 346 for the Intervention and Control group.

The inclusion criteria for the study was pregnant women between the ages of 15-49 years attending ante-natal clinics in a primary health centre irrespective of marital status, women who have never used any LARC method before, women who have no any medical, psychological, Obstetric or Gynecological conditions that are considered as contra-indicated (WHO guideline) to the use of LARC and women who are indigenes of Katsina State and reside in the respective ward/wards being served by the corresponding primary health centre. While the Exclusion Criteria for the study include women less than the ages of 15 years irrespective of marital status, women who were using LARC method prior to index pregnancy and are willing to continue, women with any condition (medical, psychological, Obstetric and Gynecological) that makes use of LARC contra-indicated (WHO guideline) and pregnant women that came to the who do not reside in Katsina were also excluded from the study.

Data was analyzed using SPSS version 26. Descriptive analysis was performed first to explore the baseline characteristics of the respondents as well as to explore their reproductive and obstetric history. Chi-square test was performed to explore the homogeneity of participants' socio-demographic at baseline between the health education intervention and the control groups. McNemar's test was conducted to assess the effect of Health education intervention on intention to utilize LARC; Mixed design repeated measures ANOVA was conducted to explore the difference between and within group pre and post intervention as well as interactions.

Results

Response Rate

Seven Hundred and Ninety-Six (796) were enrolled into the study with 398 participants in each arm of intervention and control groups. Of these, 56 participants were lost to follow-up at two months; 31 among the intervention group and 26 among the control group. The response rate at two months was 92.9% overall with 92.2 % and 93.5% for intervention and control groups respectively. Similarly, the response rate at six months was 86.1% overall with 85.1% and 86.9% for intervention and control groups respectively. Figure 1 below shows the participant recruitment process until the end of the study.

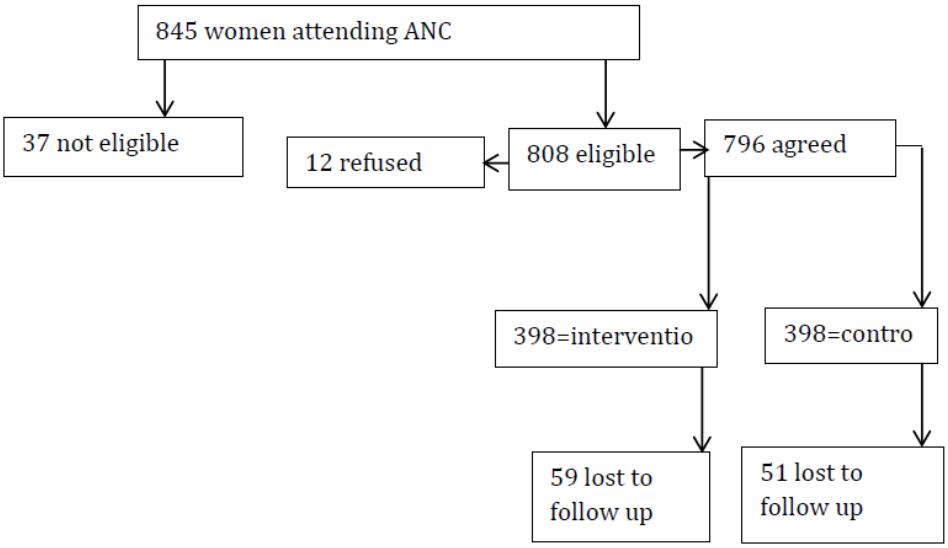

Figure 1. Flow Chart of Recruitment of Respondents

Reproductive and Obstetric History

Table 1 below shows reproductive and obstetric history of respondents. Majority of responds were married between 20-29 years of age (79.7%). Almost half of the respondents 168 (49.6%) in the intervention group and 182 (52.6%) of respondents in the intervention groups were gravida 1-3. Majority of the respondent 248(53.1%) in the intervention and 245(70.8%) of respondent have desired to have 5-8 children. Majority of the respondents both in the intervention and control group had their first delivery with the age group of 20-29yeras (53.1% and 60.4% respectively).

Majority of the respondents 263 (77.6%) in the intervention and 268 (77.5) in the control group have previous history of contraceptive use. However, only 7.9% (5.4% and 2.5%) in the intervention and control group respectively used LARC. More than ninety percent (92.8%) of the respondents had no history of abortion.

Table 1. Reproductive and Obstetric History of Participants (n=685)

Variables	**Frequency and Percentage (%)**				
	Intervention	**Control**	**Total**	**Type of test (value)**	**p-value**
Age at first marriage (years)					
15-19	30 (8.8)	23 (6.6)	53 (7.7)	$\chi 2$ (7.040)	0.030
20-29	280 (82.6)	266 (76.9)	546 (79.7)		
30-39	29 (8.6)	57 (16.5)	86 (12.6)		
No of pregnancy including index					
1-3	168 (49.6)	182 (52.6)	350 (51.1)	$\chi 2$ (4.950)	0.084
4-6	98 (28.9)	112 (32.4)	210 (30.7)		
7 and above	73 (21.5)	52 (15.0)	52 (18.2)		
No. of Deliveries					
0-4	252 (60.5)	221 (63.9)	473 (69.1)	$\chi 2$ (4.961)	0.030
Above 4	134 (39.5)	125 (36.1)	259 (37.8)		
No of living children					
1-4	231 (68.1)	245 (70.8)	476 (69.5)	$\chi 2$ (4.012)	0.045
More than 4	108 (31.9)	101 (25.7)	209 (30.5)		

Desired family size					
1-4	48(14.4)	61(17.9)	109 (16.1)	$\chi 2$ (1.620)	0.445
5-8	248 (53.1)	245(26.6)	245 (71.8)		
More than 8	38 (11.4)	35 (10.3)	73910.8)		
Abortion history					
No	324 (95.6)	312 (90.2)	636 (92.8)	$\chi 2$ (7.523)	0.006
Yes	15 (4.4)	34 (9.8)	49 (7.2)		
Contraceptive use history					
No	263 (77.6)	268 (77.5)	137 (20.0)	$\chi 2$ (11.720)	0.008
Yes	76 (22.4)	78 (22.5)	551 (80.0)		
Method of contraception used					
LARC(Implant)	19 (5.6)	18 (5.2)	37 (5.4)	$\chi 2$ (8.907)	0.063
LARC(IUD)	11 (3.2)	6 (1.7)	17 (2.5)		
None	76 (22.4)	110 (31.8)	186 (27.2)		
Short acting	217 (64.0)	200(57.8)	417 (60.9)		
Traditional method	16 (4.9)	12 3.5)	28 4.1)		

Change in Intention to Delay Next Pregnancy from baseline to three-month and six-month post-intervention in Intervention and Control Group

Result of McNemar's test shows that there was a significant increase in the proportion of those intending to delay next pregnancy following intervention from three month to six-month post intervention among intervention group (p-value <0.001) as indicated in Table 2 below. However, the participants in the control group shows no significant increase in the proportion of those intending to delay next pregnancy from baseline to three-month and three months to six months post intervention (p-value =0.250; 0.230; 0.303) respectively.

Table 2. Change in intention to delay next pregnnacy following intervention in Intervention (N=339) and control group (N=346)

Variables	**Frequency (n) and Percentage (%)**			
	Time 1	**Time 2**	**Change**	**p-value**
Intervention group				
	Baseline	3 Month post		
Yes	236 (69.6)	255 (75.2)	5.6	0.001*
No	103(30.4)	84 (24.8)		
	Baseline	6 Months post		
Yes	236 (69.6)	283 (83.5)	13,9	0.001*
No	103(30.4)	56 (16.5)		
	3 Month post	6 Months post		
Yes	25 (75.2)	283 (83.5)	8.3	0.001*
No	84 (24.8)	56 (16.5)		
Control group				
	Baseline	3 Months post		
Yes	226 (65.3)	227 (65.6)	0.3	0.250
No	120 (34.7)	119 (34.4)		

	Baseline	6 Months post		
Yes	226 (65.3)	226 (65.3)	0.0	0.230
No	120 (34.7)	120 (34.7)		
	3 Months post	6 Months post		
Yes	227 (65.6)	226 (65.3)	-0.3	0.303
No	119 (34.4)	120 (34.7)		

*p-value was calculated using McNemar's test. *Significant at <0.05*

Effect of Group, Time and their Interaction on Intention to Delay Next Pregnancy

A mixed design ANOVA on intention to delay next pregnancy revealed significant main effects on time and group as well as time*group interaction as shown in table 3 below. Knowledge scores changed significantly across the time points. The intervention group were willing to delay next pregnancy than the control group (F (1, 678) = 1812.114, *p*-value <0.001, η^2 = 0.726). Moreover, there was statistically significant interaction between time and group (F (2, 1366) = 37.928, *p*-value <0.001, η^2 = 0.57) shown in Table 3 indicting that intention to delay next pregnancy increase over time differently for the two groups.

This indicate that educational intervention changes intention to delay next pregnancy that was sustained at 6 months whereas the control group showed no improvement in unchanged finding means that the intervention and control groups exhibited intention differently pre and post intervention.

Table 3. Summary table of repeated measures ANOVA for mean LARC knowledge scores (Within and Between Group)

Source Variable						
LARC knowledge scores	**Type III sum of squares**	**df**	**Mean square**	**F**	**p-value**	**Partial Eta η2**
Within Group						
Time	1.740	2	0.870	41.403	<0.001*	0.57
Group*time	1.594	2	0.797	37.928	<0.001*	0.53
Error (time)	28.700	1366	0.21			
Between Group						
Group	5.872	1	1028.83	1812.1	<0.001*	0.726
Error	387.775	638	0.568			

Note: (*) – significant p< 0.05

Discussion

The Study assessed the effectiveness of theory-based health education intervention on intention to delay next pregnancy among women attending antenatal care in Katsina State, Nigeria. Finding of the study there is significant improvement in intention to delay next pregnancy among women in the intervention group which was sustained six months post women. The findings were similar to the findings of a study conducted based on national data in India to assess desire to delay first delivery among married women which shows that women with higher education (28.8%, $p < 0.01$); women with high income (23.4%, $p < 0.01$) and those exposed to family planning (22.7%, $p < 0.01$) were more likely to wait longer for the birth of their first child [9]. The findings were also similar to findings from a study among women with private insurance to assess How pregnancy intentions affect contraceptive choices when cost for

contraception is not a factor which shows that pregnancy intentions predicted LARC use and other methods modern contraceptive when compared with no method with 8.4% of the respondents using LARC [10].

However, the results contradict that of findings from a study conducted among young women in changing desire for pregnancy in changing relationship dynamics with stated that the desire to have pregnancy increased over time as relationship became more serious and those women with lower education status were less likely to became pregnant that men with equal education status [11].

Conclusion

This study demonstrated that a theory-based health education intervention significantly improves women's intention to delay next pregnancy using LARCs in Katsina State, Nigreia. The findings support the integration of behavioral models, particularly the Health Belief Model, into reproductive health programming to address gaps in contraceptive uptake. Policymakers and program implementers should scale up structured health education campaigns at antenatal clinics to enhance informed contraceptive choices among women.

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