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EFFECT OF HEALTH EDUCATION INTERVENTION ON THE UTILIZATION OF MODERN CONTRACEPTIVES AMONG ADOLESCENT MOTHERS IN ONDO STATE, NIGERIA

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ABSTRACT: *Background: Modern contraceptives help women control the number of children they have, the spacing between pregnancies, and the timing of deliveries, which lowers the likelihood of recurring unintended pregnancies. Contraception refers to the deliberate prevention of pregnancy by employing a range of methods such as objects and devices, sexual practices, chemicals, medications, or surgical interventions. However, this study examined the effect of health educational intervention on the utilization of modern contraceptives among adolescent mothers in Ondo State, Nigeria. Methodology: The study employed a quasi-experimental design with one-arm intervention group and control. A sample size of 60 participants was computed for the study (30 participants for each group). A structured and validated questionnaire was used to collect data with Cronbach's alpha reliability index 0.85. Data was collected at baseline, immediate post-intervention and 12th week follow-up. Data was analyzed using descriptive and inferential statistics at 5% level of significance. Results: Findings showed that at baseline, the mean score for utilization of modern contraceptives of the control group (6.30 ± 0.45) was significantly moderate than the experimental group (7.65 ± 0.74), with $p < 0.001$. This indicates that there is not much difference in baseline utilization between the two groups. There was also a significant difference ($p < 0.05$) in the utilization of modern contraceptives among adolescent mothers in the control group and the experimental group at 12th follow-up, which indicates an impact in the utilization of modern contraceptives due to the intervention study. Conclusion: The education intervention increased the utilization of modern contraceptives among adolescent mothers in selected primary healthcare facilities in Ondo State. It was recommended that primary health facilities should adopt this program for developing self-efficacy and right perception about modern contraceptives for adolescent mothers and encourage replication throughout the country.*

KEYWORDS: Adolescents Mothers, Health Education, Knowledge, Modern Contraceptives.

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INTRODUCTION

Modern contraceptives help women control the number of children they have, the spacing between pregnancies, and the timing of deliveries, which lowers the likelihood of recurring unintended pregnancies. Contraception refers to the deliberate prevention of pregnancy by employing a range of methods such as objects and devices, sexual practices, chemicals, medications, or surgical interventions. Therefore, any device or action that aims to prevent a woman from conceiving can be classified as a contraceptive (Jain & Muralidhar, 2011).

Modern contraceptive refers to a device or medical procedure that disrupts the process of reproduction resulting from sexual intercourse. These technological advancements have been designed specifically to surpass biological limitations and enable unrestricted sexual freedom (Hubacher & Trussell, 2015).

Adolescent mothers are at risk of experiencing bad health outcomes due to the limited access to and utilization of modern contraceptives. In addition, this age group experiences a greater discrepancy between their desire for modern contraception and their actual age (UNFPA, 2015). Morgan and colleagues (2020) found out that all these factors emphasize the specific challenges that adolescent mothers face, especially during their initial experiences of pregnancy, childbirth, and parenting. The currently available national- and state-level statistics in 2017 indicated that sexual activity and motherhood commenced at a young age (Morgan et al., 2020). Within the context of Cross Rivers State, Nigeria (NPC, 2014), 18% of young females between the ages of 15 and 19 have initiated the process of becoming mothers (Morgan et al., 2020).

Many reproductive health and contraceptive studies on adolescent mothers are more likely to miss the significance of knowledge of the fertility window with the prevention of unintended pregnancy through contraception (Ojoniyi et al., 2022). Several studies have documented that unwanted pregnancy can be prevented through the effective use of modern contraceptive intervention. Circumstances such as age and sociocultural factors to effective contraceptive methods have restricted adolescents from access (Ajayi et al., 2021). This is because the lack of knowledge surrounding contraceptive methods further contributes to the unfortunate reality of widespread non-use among adolescent mothers. Furthermore, adolescent mothers seeking to use contraceptive methods often face mistrust or rejection by health care providers for their age (Demeglio et al., 2018), as well as general difficulties accessing contraceptive services (Chae & Woog, 2016).

Limited awareness of contraceptive alternatives and enduring stigmas surrounding adolescent sexual health contribute to the high rate of recurring unplanned pregnancies in Nigeria. According to recent research, many adolescent mothers are unaware of the best ways to prevent pregnancy, which makes them more susceptible to future unintended births (Ogujiuba et al., 2022; OlaOlorun et al., 2020). A cycle of repeat unplanned pregnancies is caused by socioeconomic variables that further impede access to reproductive health treatments, such as poverty and low educational attainment (Ibikunle et al., 2023; Ojoniyi et al., 2022). Furthermore, repeat unplanned pregnancies have serious repercussions, impeding young women's access to economic and educational possibilities in addition to negatively impacting the health of the mothers and their offspring (Ukoji et al., 2022; Kaphagawani & Kalipeni, 2017).

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This problem has wider ramifications for Nigeria's socio economic development, public health and also posing risks to individuals. Previous studies reported the need for comprehensive strategies to address the multifaceted factors contributing to repeat unplanned pregnancy among adolescent mothers in Nigeria. Such studies highlighted the significant knowledge gaps and sociocultural barriers affecting modern contraceptive use (Ogujiuba et al., 2022; Kaphagawani & Kalipeni, 2017), the impact of community-based programs on contraceptive uptake (Morgan et al., 2020), and the role of access to services in shaping reproductive health behaviors (Olaolorun et al., 2020; Ojoniyi et al., 2022; Ibikunle et al., 2023).

The provision of comprehensive health education to adolescent mothers regarding the significance of utilizing modern contraception as a strategy to minimize the potential risks associated with rapid recurrent births is of the utmost significance. Hence, the primary objective of this study is to examine the effect of health educational intervention on the utilization of modern contraceptives among adolescent mothers in Ondo State, Nigeria.

METHODOLOGY

Study Design

For this study, a quasi-experimental design was employed, consisting of one experimental group and one control group, to assess the effect of health educational intervention on the utilization of modern contraceptives among adolescent mothers in Ondo State, Nigeria. The choice of a quasi-experimental design is appropriate since the groups were not randomly assigned. This design has proven effective for similar studies as it allows for the identification of a comparison group or time period that closely resembles the treatment group or time period in terms of baseline characteristics. Prior to the intervention, a baseline data was collected from both the control and experimental groups. This was followed by the designed intervention in the experimental group for a period of six (6) weeks while the control group was given necessary attention but not the designed intervention. An outcome evaluation was carried out in both the control and experimental groups soon after the intervention. Then, at the twelfth (12^{th}) week, from the date of the first data, an impact evaluation was carried out in the two groups.

A sample size of 30 adolescents mothers for each group was derived using Cochran's formula. Adolescent mothers in each of the selected PHCs were selected purposively during immunization clinics resulting in a total of fifteen (15) participants per LGA for this study. Experimental Group was assigned to health education modules on knowledge of modern contraceptives for 1 hour once weekly and Control Group had training on menstrual hygiene for 1 hour once a week, both for six weeks. A total of three research assistants were trained to this effect.

Research Instrument and Data Collection

The research method chosen for this study was quantitative in nature. To create a reliable and valid instrument for data collection, the researcher gathered information from various sources including a review of relevant literature, as well as examining instruments used in similar studies. With this information, an appropriate instrument was developed for use in collecting

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data from the participants. The instrument was designed to ensure that it aligns with the research objectives and the research questions. The instrument measured respondents' personal level factors, environmental factors and utilization of modern contraceptives. The same instrument was administered at the baseline, immediate post intervention and 12-weeks follow up.

Table 1: Description of the Data Collection

Groups	Baseline Data	Interventions	Outcome Evaluation (end of intervention program)	Impact Evaluation(at 12th weeks)
Control Group	O	-	O	O
Experimental Group	O	X	O	O

Key: X = Intervention

O = Outcome

Baseline Data Collection

Baseline was the first phase of data collection from the participants. The baseline data served as bases for comparison between the intervention and control. This also served as means of detecting changes attributable to the intervention. Data were obtained from the intervention and control groups with the use of structured and validated questionnaire.

Immediate Post-intervention Data Collection

Immediately after the experimental group received the 6-week intervention, the same data collection instrument used for baseline data collection was used to get responses from the intervention and control group for the second time. The control group received just a 1-day health talk on menstrual hygiene, not related to the subject matter as recommended in the principles of ethics that the control group should also benefit from the study (SASLHA, 2011). The variables measured basically were the independent and dependent variables. Socio demographic data were kept throughout the study.

End Line Data Collection

The end line data collection was the third and the last phase of data collection. The end line data was obtained using the same data collection instrument and this was done at the 12th week follow up. Focus was more on the outcome variable which was the utilization of modern contraceptives.

Sample Size

A sample size of 60 participants was computed for both groups using sample size determination for intervention. According to Zamboni (2018), having a sample size of 30 and above will minimize the margin of error, give accurate mean value and identify outliers that could skew the data in a smaller sample size (Zamboni, 2018; Sarah, 2015). Hence, a total of 30 participants were recruited equally from four (4) local government areas of the state for the study for those that met the inclusion criteria on the intervention arm.

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Study Area

Ondo State is a state in southwestern Nigeria, located at the coordinates of 4° 3011 and 611 East longitude from the Greenwich Meridian, and 5° 4511 and 8° 1511 North latitude from the Equator. The land area of Ondo State is around 14,793 square kilometers (km^2) (Ondo State Government, 2016). The population of the state is estimated to be around 3,460,877 as reported by the National Bureau of Statistics (NBS) in 2019. The state has copious precipitation and possesses a climate that is representative of tropical regions. The dry season spans from November to February/March, whereas the rainy season typically commences in March and lasts until approximately October. The state experiences consistently high levels of humidity, with temperatures ranging from 21°C to 29°C year-round. The state experiences an annual precipitation ranging from 1,150 mm in its Northern parts to 2,000 mm in the south. The state possesses abundant vegetation, characterized by a dense rainforest in the southern areas and a less dense sub-savannah forest in the northern area.

There are a total of eighteen (18) local government areas in the three (3) senatorial districts in Ondo State. In Ondo central, there are six (6) local governments, which include: Akure North, Akure South, Idanre, Ifedore, Ondo East and Ondo West. In Ondo North, there are six (6) local governments which include: Akoko Northeast, Akoko Northwest, Akoko Southeast, Akoko Southwest, Ose and Owo. In Ondo South, there are six (6) local governments, which include: Ese Odo, Ilaje, Ile Oluji/Okeigbo, Irele, Odigbo, and Okitipupa.

For this study, a total of four (4) LGAs were randomly selected across the state. Two (2) LGAs each for the control and intervention groups. The two (2) LGAs assigned for the intervention group and the two LGAs for the control groups are extremely located to each other and the minimum distance between the two is 100 km. This is a reasonable distance between the control and interventional group to avoid contamination of data between the groups.

Population of Study

The population for this study were recruited adolescent mothers identified in the primary health care facilities within the selected local government areas of Ondo State for both the experimental and control groups. A total of four local government area were used for the study with 15 respondents recruited from each LGA through purposive sampling during immunization clinics. The postpartum period is an excellent opportunity to initiate contraception because, at this moment, women are motivated to avoid a new pregnancy (Almeida et al., 2018). The adolescent mothers were within the age range of 15-19 years old. The age range selected is the adolescence age recognized globally.

Ethical Consideration

Prior to data collection from the respondents, a detailed proposal containing the study protocol was submitted to Babcock University Health Research Ethics (BUHREC) seeking approval for the study. After the proposal was dully reviewed, an approval was obtained to proceed in carrying out the study. Ethical approval was also obtained from the various local government areas selected for the study with collaboration with the head of primary health care centers in all the LGAs. Consent was sought from participants who were 18 years and above and from parents/guardians who had under 18 years adolescent mothers. Also, assent

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was sought from participants who were below 18 years before data collection after they were told the purpose of the study.

Data Analysis

The data collected for the study was collated, entered and coded using the Statistical Product for Service Solutions (SPSS) version 23. The data was cleaned by running a frequency analysis on each item and checking responses to ensure that the values were accurately coded. Data was analyzed using descriptive and inferential statistics at 5% level of significance. Effect size (ES) was used to measure the magnitude of the intervention in the experimental group.

RESULTS

Demographic Characteristics of Participants

Overall, there were 60 participants recruited into either control or interventional groups in equal proportions. The majority (60%) of the participants were between age 15 and 17 and there were more singles in both control (90%) and the experimental group (73.3%). More than 90% of the participants are of Yoruba ethnicity and two-third were in senior secondary school while others were still in primary school. Moreover, there is no significant association between the comparison groups and the demographic variables (p-value > 0.05). Therefore, the two groups are comparable at baseline before the implementation of health education as a sole intervention in the study.

Table 2: Socio-demographic Characteristics of Participants at Baseline

Variables		Baseline Control n (%)	Baseline Experimental n (%)	Total n (%)	Chi-sq.	P-value
Age	15-17 years	21 (70.0)	15 (50.0)	36 (60.0)	2.500	0.187
	18-19 years	9 (30.0)	15 (50.0)	24 (40.0)		
	Total	30 (100.0)	30 (100.0)	60 (100.0)		
Marital status	Single	27 (90.0)	22 (73.3)	49 (81.7)	2.783	0.181
	Married	3 (10.0)	8 (26.7)	11 (18.3)		
	Total	30 (100.0)	30 (100.0)	60 (100.0)		
Religion	Christian	23 (76.7)	19 (63.3)	42 (70.0)	1.270	0.399
	Muslim	7 (23.3)	11 (36.7)	18 (30.0)		
	Total	30 (100.0)	30 (100.0)	60 (100.0)		
Ethnicity	Yoruba	28 (93.3)	27 (90.0)	55 (91.7)	2.018	0.365
	Hausa	1 (3.3)	0 (0.0)	1 (1.7)		
	Igbo	1 (3.3)	3 (10.0)	4 (6.7)		
	Total	30 (100.0)	30 (100.0)	60 (100.0)		

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Education	Primary	16 (53.3)	8 (26.7)	24 (40.0)	4.444	0.064
	Secondary	14 (46.7)	22 (73.3)	36 (60.0)		
	Total	30 (100.0)	30 (100.0)	60 (100.0)		

Utilization of Modern Contraceptives among Participants at Baseline

According to the result in Table 4.2, the utilization of modern contraceptives recorded a very low mean score of 6.30 ± 0.45 for control group and low mean score of 7.65 ± 0.74 for the experimental group, and it showed that there is a significant difference between control and experimental groups at p-value of 0.021 respectively (see Table 4.3 for details). This is a coincidence that is closely monitored in the analysis results with regards to the follow-up results.

Table 4.2: Comparison of Utilization of Modern Contraceptives among Participants at Baseline

Variables	**Maximum Points on Scale of Measure**	**Control Group N=30**		**Experimental Group N=30**		P-value
		$\bar{X}$(SE)	±SD	X(SE)	±SD	
Utilization of modern contraceptives	36.0	6.30(0.45)	1.68	7.65(0.74)	4.82	0.021

*** p<0.05 (independent sample t-test)**

Immediate Impact Evaluation of Health Educational Intervention on the Utilization of Modern Contraceptives among the Participants in the Experimental Group

Table 4.3 presents a comparison of measures of utilization of modern contraceptives among participants at immediate impact evaluation. The results were analysed using an independent sample t-test. The scores for the utilization of modern utilization were also significantly different (p=0.001), indicating drastic increase in immediate post evaluation due to the intervention.

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Table 4.3: Comparison of Measures of Utilization of Modern Contraceptives among Participants at Immediate Impact Evaluation

Variables	Maximum Points on Scale of Measure	Baseline N=30		Immediate N=30		P-value
		X̄(SE)	±SD	X(SE)	±SD	
Utilization of modern contraceptives	36	7.65(0.74)	4.82	25.65(0.74)	4.82	<0.001

*** p<0.05 (independent sample t-test)**

Outcome Evaluation at 12th Week Follow-up for Control and Experimental Group for the Study

At the end of 12th week follow up in the study, a final assessment of the key variables was carried out. In order to determine the magnitude of change that occurred for the variables, control scores are compared with the corresponding mean scores recorded for the 12th week follow-up. The results of the study indicate that, at the 12-week follow-up, there is a significant difference in the utilization of modern contraceptives between the control and experimental groups. In other words, whereas the degree of the utilization increased among the experimental group, there was no such increase among the control group, a proof of the efficacy of the educational intervention program in positively influencing utilization of modern contraceptives.

Table: 4.4: Independent T-test Analysis on Utilization of Modern Contraceptives between the Control Group and the Intervention Group at 12th Week Follow-up

Variable	Control Group (N=30)		Intervention Group (N=30)		Mean difference	***ES (95% CI	Sig.
	X̄ (SE)	±SD	X̄ (SE)	±SD			
Utilization of modern contraceptives	**6.10±0.21**	**1.45**	**27.56± 1.02**	**5.15**	**-21.46**	**3.84 (-16.45 to -12.29)**	**0.000**

*p<0.05 (p-value is level of significance). ** Measured on a 28-point scale. ***ES: effect size of the intervention between baseline and impact evaluation computed from Cohen's d, the corresponding 95% CI.

Evaluation of Baseline and 12th Week Follow-up of the Health Educational Intervention on the Factors Related to Modern Contraceptive Use for Experimental Group

The result of the analysis reveals that the utilization of modern contraceptives show large positive effect sizes, indicating significant improvements after the intervention. Overall, the intervention had a substantial and positive impact on most of the measured variables, demonstrating a significant improvement in the utilization of modern contraceptives.

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Table 4.5: Effect Size Estimates Based on the Health Education Intervention on Experimental Group across Baseline and 12th Week Follow-up

		95% Confidence Interval		
Variables	Point Estimate	Lower	Upper	p-value
Utilization of Modern contraceptives	6.789	5.454	7543	<0.001

DISCUSSION

The findings from our study showed that the median age ranged from 15-17 years old indicating that even young adolescent mothers may have unintended pregnancy the same way as older adolescent mothers. According to Agbo, Eguvbe, Alabra and Alagoa (2020), this is the age group at the greater risk of sexual exploitation; hence, they require help in making informed choices regarding their reproductive health. Also, this age range has been identified as a critical period for reproductive health interventions given the rise in sexual activity and necessity for contraception awareness (Afolabi et al., 2021; Umoren et al., 2020).

The prevalence of single participants in both groups (90% in the control and 73.3% in the intervention group) reflects the typical marital status of adolescents in Nigeria, where early marriage, while still prevalent, is more common in northern regions compared to southwestern Nigeria, including Ondo State. This marital status distribution is relevant as unmarried adolescent mothers often face barriers to accessing contraceptive services due to stigma and cultural norms (Crawford et al., 2021).

Regarding educational attainment, two-thirds of the participants were in senior secondary school, while the rest were in primary school. This illustrates the standard educational progression of adolescents in Nigeria and is significant since literacy levels can influence health-seeking behaviors, including contraceptive use (Michael et al., 2024). Adolescents including young mothers with higher educational levels are generally more likely to seek reproductive health services and engage in informed decision-making about contraception (Fatusi & Hindin, 2018).

Importantly, there was no significant association between the study groups and the demographic variables ($p > 0.05$), suggesting that randomization was successful, and both groups were comparable at baseline. This comparability is essential in interventional studies as it guarantees that any observed differences in outcomes can be attributed to the intervention rather than pre-existing differences in socio-demographic factors (Olukoga et al., 2024). The use of health education as the sole intervention is particularly relevant in adolescent reproductive health studies, where behavioral change communication has been shown to influence contraceptive uptake (Burchett et al., 2022). Overall, the socio-demographic profile of the participants aligns with previous studies on adolescent mothers' reproductive health in Nigeria, reinforcing the need for targeted health education programs to improve contraceptive utilization among them (Praxedes & Queiroz, 2018).

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The significant uptake of modern contraceptives in the experimental group following the intervention supports findings from previous studies in Nigeria and other sub-Saharan African countries. For instance, Morgan et al. (2020) demonstrated that community-based sexual health programs led to a substantial increase in contraceptive utilization among first time mothers, largely due to improved awareness and reduced stigma. Additionally, Rimer and Viswanath (2019), in their work on Health Behavior Theories, emphasized that information and behavioral skills development are key components of behavior change interventions.

The intervention led to a significant positive shift in attitudes toward contraceptive use, reinforcing previous findings that well-designed educational interventions can challenge negative beliefs and promote acceptance of modern contraceptive use (Agha et al., 2021). As opined by Guzzo and Hayford (2018), adolescent mothers who participated in sexual health programs developed more positive attitudes towards contraception, which subsequently influenced their likelihood of use.

CONCLUSION

The study determined the impact of health educational intervention programs on the knowledge and attitude of modern contraceptives among adolescent mothers in Ondo State. The significance of this study lies in its potential to contribute to the adoption of modern contraceptive utilization among adolescent mothers in Ondo State, Nigeria. The implementation of health education intervention programs has the potential to increase the knowledge of modern contraceptives of adolescent mothers ultimately leading to a reduction in repeat unplanned pregnancy among young women.

As a result, the intervention program has a significant impact on the knowledge of modern contraceptives among the experimental group, with a wide margin between the 12th week follow-up utilization of modern contraceptives and the baseline result. A similar result was obtained between the control and the experimental group at 12th week follow-up, indicating a substantial difference in the degree of knowledge and attitude of modern contraceptives between the two groups.

It is essential to provide adolescent mothers with a confident, encouraging knowledge towards creating a sense of self efficacy and developing healthy sexual and reproductive behaviors. Despite having experienced an episode of unplanned pregnancy, the period of adolescence should be valued and the individuals are required to understand their bodies as they evolve to facilitate healthy communications and also develop healthy and protective habits in their relationships. The current study thus enhances knowledge on determinants of modern contraceptive utilization, by showing that the individuals' confidence in their ability to uptake modern contraceptives may be enhanced for safer sexual practices and prevention of repeat unplanned pregnancy

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RECOMMENDATIONS

Based on the findings of this study, I hereby recommend that:

1. Further study may adopt a longer period to assess the sustenance of the behavior change, which has been reported in the results.

2. Primary health facilities should adopt this program for developing self-efficacy and right perception about modern contraceptives for adolescent mothers and encourage replication throughout the country.

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