European Journal of Biology and Medical Science Research
Vol.9, No.4, pp.48-60, 2021
Print ISSN: ISSN 2053-406X
Online ISSN: ISSN 2053-4078

EFFECTIVENESS OF REPRODUCTIVE HEALTH EDUCATION AMONG IN-SCHOOL ADOLESCENTS IN ANDONI LOCAL GOVERNMENT AREA OF RIVERS STATE, NIGERIA

[1]Ene-Bongilli, Goodness
Ignatius Ajuru University of Education
Department of Human Kinetics Health and Safety Education

[2]Akoko, Sokiprim
University of Port Harcourt
Department of Pharmacology

ABSTRACT: *Reproductive health knowledge is significant in the growth and development of young people and this significantly impact on their educational and personal outcome as they proceed to adulthood. The aim of the study was to investigate the effectiveness of reproductive health education among in-school adolescents in Andoni Local Government Area of Rivers State. The study used a randomized control-group pretest-posttest research design. A multi-stage sampling procedure was used to randomly select samples for the study. Data was collected using pretested questionnaire with reliability co-efficient of 0.89 for knowledge questions. Data was analyzed using Statistical Package for Social Science (SPSS) for windows (Version 21). Data were presented using descriptive statistics to answer research questions and inferential statistics such as ANOVA was used to test hypotheses at 0.05 level of significance. Cohen criterion for interpretation of the eta value was used to interpret the effectiveness of reproductive health education with 0.01 as small effect, 0.06 moderate effect, and 0.14 as large effect. The study findings indicated that intervention group had a higher mean knowledge score 23.76±2.98 while the control group had a mean score of 22.31±22.3. The study recommended that teachers of senior secondary schools should periodically use mixed teaching method to better incorporate old and young adolescents to increase better reproductive outcomes.*

KEYWORDS: reproductive health education, in-school adolescents, Andoni Local Government Area, Rivers State, Nigeria

INTRODUCTION

Adolescence is a critical period of human development, with rapid physical, psychosocial, cognitive, and emotional development. The social context in which adolescents live, learn, and grow, including their families, media, schools, and neighborhoods, has a significant impact on their health and well-being. Adolescence also brings an increase in independence and autonomy from family, as well as the importance of peer relationships (Patton et al 2016 & Sawyer et al

2012). Individuals between the ages of 10 and 19 are referred to as adolescent. The transition from infancy to adulthood is known as adolescence. During these formative years, significant physical and psychological changes occur (WHO, 2006). Adolescence is a pivotal period in the lives of both boys and girls all around the world. Puberty in youth is a period of increased vulnerability to dropping out of school, early marriage, and pregnancy. (Unicef Research Report, 2012) Furthermore, these teenagers do not have access to healthcare that is tailored to their individual needs. (Malleshapa et al., 2011).

Adolescents have been linked to a reproductive health education intervention as an effective strategy for behavior modification. Various intervention studies have shown that health education has resulted in a significant shift in behavior. Rao et al (2008) and Etemad et al (2009) study showed that health education could effect a change in behaviour. For instance, the result of the study demonstrated that respondents' health education improved respondents' knowledge on reproductive health and could effect change in behaviour. Studies have indicated that there is need to strengthen the reproductive health knowledge of these adolescents . Knowledge of male and female reproductive system among adolescence showed that there was a gain on knowledge on male and female reproductive system. The study of Etemad et al (2009), Gaferi et al (2018), correct knowledge of reproductive system Gaferi et al (2018), Mbizvo et al (1997), Rao et al. (2008), Adeokun et al (2009), Bobhate and Shrivastava (2011), Malleshappa et al (2011) correct knowledge on signs of puberty, menstruation and menstrual hygiene

Purpose of the Study

The purpose of this study was to investigate the effectiveness of reproductive health education among in-school adolescents in Andoni Local Government Area of Rivers State. Specifically, the study sought to:

1. Evaluate the impact of health education intervention on knowledge of male and female reproductive system among senior secondary school students in Andoni Local Government Area, Rivers State.
2. Assess the impact of health education intervention on knowledge of puberty and menstruation among senior secondary school students in Andoni Local Government Area, Rivers State.
3. Determine the impact of health education intervention on level of reproductive health knowledge among senior secondary school students in Andoni Local Government Area, Rivers State based on age
4. Ascertain the impact of health education intervention on level of reproductive health knowledge among senior secondary school students in Andoni Local Government Area, Rivers State based on gender

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Research Questions

1. To what extent does health education intervention impact on knowledge of male and female reproductive system among senior secondary school students in Andoni Local Government Area of Rivers State?
2. To what extent does health education intervention impact on knowledge of puberty and menstruation among senior secondary school students in Andoni Local Government Area of Rivers State?
3. To what extent does health education intervention impact on knowledge of reproductive health among secondary school student in Andoni Local Government Area of Rivers State based on age?
4. To what extent does health education intervention impact on knowledge of reproductive health among senior secondary school student in Andoni Local Government Area of Rivers State based on gender?

Hypothesis

1. Health education intervention has no significant impact on knowledge of male and female reproductive system among senior secondary school students in Andoni Local Government Area of Rivers State.
2. Health education intervention has no significant impact on knowledge of puberty and menstruation among senior secondary school students in Andoni Local Government Area of Rivers State.
3. Health education intervention will not significantly impact on knowledge of reproductive health among senior secondary school students in Andoni Local Government Area of Rivers State based on age.
4. Health education intervention will not significantly impact on knowledge of reproductive health among senior secondary school students in Andoni Local Government Area of Rivers State based on gender.

METHODOLOGY

Pretest/posttest research design was used for the study which include preintervention survey and post intervention survey.

RESULTS AND ANALYSIS

Research Question 1: To what extent does health education intervention impact on knowledge of male and female reproductive system among senior secondary school students in Andoni Local Government Area of Rivers State?

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Table 1.1: Mean and standard deviation on effect of health education intervention on knowledge of male and female reproductive system among senior secondary school students.

Test	Group	M	SD	MD	Eta	Decision
Pre-test	Intervention	18.65	2.44			
Post-test	Intervention	23.76	2.98	5.11	**0.86**	**Large effect**
Pre-test	Control	17.15	3.40			**Large effect**
Post-test	Control	22.31	22.3	5.16	**0.27**	

Mean and standard deviation was conducted on effect of health education intervention on knowledge of male and female reproductive system among senior secondary school students in Andoni Local Government Area of Rivers State after six weeks. The result of the study showed that respondents in the intervention group had a mean score of 18.65±2.44 compared to a mean score of 17.15±3.40 before the health education intervention. After the six weeks intervention respondents in the intervention group had a higher mean knowledge score 23.76±2.98 while the control group had a mean score of 22.31±22.3. The eta square statistics was calculated to ascertain the effect of health education intervention on knowledge of male and female reproductive system. The eta square statistics of 0.86 was determined indicating a large effect of health education on the intervention. Thus, health education intervention is said to have a large effect on knowledge of male and female reproductive system among senior secondary school students in Andoni Local Government Area of Rivers State.

Research Question 2: To what extent does health education intervention impact on knowledge of puberty and menstruation among senior secondary school students in Andoni Local Government Area of Rivers State?

Table 1.2: Mean and standard deviation on effect of health education intervention on puberty and menstruation among senior secondary school students.

Test	Group	M	SD	MD	Eta	Decision
Pre-test	Intervention	6.71	2.02			**Large**
Post-test	Intervention	29.56	4.59	2.57	**0.15**	**effect**
Pre-test	Control	6.72	1.87			
Post-test	Control	25.95	4.17	2.3	**0.0024**	**Small effect**

Mean and standard deviation was conducted on effect of health education intervention on knowledge of puberty and menstruation among senior secondary school students in Andoni Local Government Area of Rivers State after six weeks. The result of the study showed that respondents in the intervention group had a lower knowledge mean score of 6.71±2.02 compared

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to a mean score of 6.72±1.87 before the health education intervention. After the six weeks intervention respondents in the intervention group had a higher mean knowledge score 29.56±4.59 while the control group had a mean score of 25.95±4.59. The eta square statistics was calculated to ascertain the effect of health education intervention on knowledge puberty and menstruation. The eta square statistics of 0.15 indicating a large effect of health education on the intervention. Thus, health education intervention is said to have a large effect on knowledge of puberty and menstruation among senior secondary school students in Andoni Local Government Area of Rivers State.

Research Question 3: To what extent does health education intervention impact on knowledge of reproductive health among secondary school student in Andoni Local Government Area of Rivers State based on age?

Table 1.3: Mean and standard deviation on effect of health education intervention on knowledge of reproductive health among senior secondary school students based on age.

Age	Intervention		Control		Eta	Decision
	M	SD	M	SD		
10-14 years	110.06	4.01	94.76	16.11	0.003	**Low**
15-19years	110.03	3.92	91.75	14.36		**effect**

Mean and standard deviation was conducted on effect of health education intervention on knowledge of reproductive health among senior secondary school students in Andoni Local Government Area of Rivers State based on age after six weeks. The result of the study showed that respondents in the intervention group age 10-14years and 15-19years had mean knowledge score of 110.06±4.01 and 110.03±3.92 respectively, while respondents in the control group age 10-14years and 15-19years had mean knowledge score of 94.76±16.11 and 91.75±14.36 respectively. The eta square statistics was calculated to ascertain the effect of the intervention on the group based on age. The eta square statistics of 0.003 indicating a small effect size. Therefore, health education intervention had a small effect knowledge of reproductive health among senior secondary school students in Andoni Local Government Area of Rivers State based on age.

Research Question 4: To what extent does health education intervention impact on knowledge of reproductive health among senior secondary school student in Andoni Local Government Area of Rivers State based on gender?

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Table 1.4: Mean and standard deviation on effect of health education intervention on knowledge of reproductive health knowledge among senior secondary school students based on gender.

Gender	Intervention		Control		Eta	Decision
	M	SD	M	SD		
Males	110.45	4.86	89.73	14.33	0.07	**Medium**
Females	111.12	2.91	94.17	14.45		**effect**

Mean and standard deviation was conducted on effect of health education intervention on knowledge of reproductive health among senior secondary school students in Andoni Local Government Area of Rivers State on gender after six weeks. The result of the study showed that respondents in the intervention group male and females had mean knowledge score of 110.45±4.86 and 111.12±2.91 respectively, while respondents in the control group males and females had mean knowledge score of 89.73±14.33 and 94.17±14.45 respectively. The eta square statistics was calculated to ascertain the effect of the intervention on the group based on gender. The eta square statistics of 0.076 indicating a medium effect size. Therefore, health education intervention had a medium effect on knowledge of reproductive health among senior secondary school students in Andoni Local Government Area of Rivers State based on gender.

Hypothesis 1: Health education intervention has no significant impact on knowledge of male and female reproductive system among senior secondary school students in Andoni Local Government Area of Rivers State.

Table 1.5: Analysis of covariance on impact of health education intervention on knowledge of male and female reproductive system among senior secondary school students

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	314.527[a]	2	157.263	31.527	.000	**.167**
Intercept	6257.120	1	6257.120	1254.393	.000	**.799**
PreKnowledge on Anatomy and physiology	147.897	1	147.897	29.650	.000	**.086**
Group	240.145	1	240.145	48.143	.000	**.133**
Error	1571.272	315	4.988			
Total	170476.000	318				
Corrected Total	1885.799	317				

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A one-way analysis of covariance (ANCOVA) was conducted to determine the impact of health education on knowledge of reproductive system among senior secondary school students in Andoni Local Government Area of Rivers State. The dependent variable was the post intervention knowledge scores and the covariate was the pre-intervention knowledge score and group the fixed variable. The ANCOVA was significant, $F(1, 317) = 48.143$, $p < .05$. The null hypothesis which states that Health education intervention has no significant impact on knowledge of male and female reproductive system among senior secondary school students in Andoni Local Government Area of Rivers State was thus rejected.

Hypothesis 2: Health education intervention has no significant impact on knowledge of puberty and menstruation among senior secondary school students in Andoni Local Government Area of Rivers State.

Table 1.6: Analysis of covariance on impact of health education intervention on knowledge of puberty and menstruation among senior secondary school students

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1211.816[a]	2	605.908	32.372	.000	**.170**
Intercept	22534.301	1	22534.301	1203.953	.000	**.793**
PreKnowledge on menstruation and puberty	174.132	1	174.132	9.303	.000	**.029**
Group	1035.338	1	1035.338	55.316	.000	**.149**
Error	5895.832	315	18.717			
Total	251516.000	318				
Corrected Total	7107.648	317				

A one-way analysis of covariance (ANCOVA) was conducted to determine the impact of health education intervention on knowledge of puberty and menstruation among senior secondary school students in Andoni Local Government Area of Rivers State. The dependent variable was the post intervention knowledge scores and the covariate was the pre-intervention knowledge score and group the fixed variable. The ANCOVA was significant, $F(1, 317) = 55.316$, $p < .05$. The null hypothesis which states that Health education intervention has no significant impact on knowledge of puberty and menstruation among senior secondary school students in Andoni Local Government Area of Rivers State was thus rejected.

Hypothesis 3: Health education intervention will not significantly impact on knowledge of reproductive health among senior secondary school students in Andoni Local Government Area of Rivers State based on age.

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Table 1.7: Analysis of covariance on impact of health education intervention on knowledge of reproductive health among senior secondary school students based on age

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	34988.267[a]	4	8747.067	92.107	.000	**.541**
Intercept	61878.744	1	61878.744	651.588	.000	**.676**
PreKnowledge	6901.188	1	6901.188	72.670	.000	**.188**
Group	15181.664	1	15181.664	159.864	.000	**.338**
Age	19.563	1	19.563	.206	.650	**.001**
Group * age	86.868	1	86.868	.915	.340	**.003**
Error	29724.365	313	94.966			
Total	3317727.000	318				
Corrected Total	64712.632	317				

A one-way analysis of covariance (ANCOVA) was conducted to determine the impact of health education intervention on knowledge of reproductive health among senior secondary school students in Andoni Local Government Area of Rivers State based on age. The independent variable, age of students, included 2 levels: 10-14years and 15-19years. The dependent variable was the post intervention knowledge scores and the covariate was the pre-intervention knowledge score. The ANCOVA was not significant, $F(1, 317) = 0.206$, $p > .05$. However, only 0.2% ($\omega 2 = .002$) of the total variance in post intervention knowledge scores was accounted for by the two levels of age of student controlling for the effect of the pre-intervention score. The null hypothesis which states that Health education has no significant impact on knowledge of reproductive health among secondary school students based on age was thus not rejected. The intercept of control and intervention on age was also not significant ($p=0.34$).

Hypothesis 4: Health education intervention will not significantly impact on knowledge of reproductive health among senior secondary school students in Andoni Local Government Area of Rivers State based on gender.

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Table 1.8: Analysis of covariance on impact of health education intervention on knowledge of reproductive health among senior secondary school students based on gender

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	35392.942[a]	4	8848.235	94.459	.000	.547
Intercept	69392.147	1	69392.147	740.790	.000	.703
PreKnowledge	6644.695	1	6644.695	70.935	.000	.185
Group	33437.005	1	33437.005	356.954	.000	.533
Sex	297.824	1	297.824	3.179	.076	.010
Group * sex	229.321	1	229.321	2.448	.119	.008
Error	29319.690	313	93.673			
Total	3317727.000	318				
Corrected Total	64712.632	317				

A one-way analysis of covariance (ANCOVA) was conducted to determine the impact of health education intervention on knowledge of reproductive health among senior secondary school students in Andoni Local Government Area of Rivers State based on gender. The independent variable, gender of students, included 2 levels: males and females. The dependent variable was the post intervention knowledge scores and the covariate was the pre-intervention knowledge score. The ANCOVA was not significant, F (1, 317) = 3.179, p >.05. However, only 2.8% (ω 2 = .028) of the total variance in post intervention knowledge scores was accounted for by the two levels of gender of student controlling for the effect of the pre-intervention score. The null hypothesis which states that Health education intervention has no significant impact on knowledge of reproductive health among senior secondary school students based on gender was thus not rejected. The intercept of control and intervention on age was also not significant (p=0.119).

DISCUSSION OF FINDINGS

The result of the study in Table 4.1 The study indicated a large effect of health education intervention on male female reproductive system which was statistically significant at 0.05 alpha level. Also respondents from the intervention experienced a higher mean knowledge (23.76±2.98). This finding is in line with the findings of Etemad et al. (2009) on impact of health education program on reproductive health knowledge among adolescents: a school based

intervention study in Assuit, Upper Egypt showed an increase in knowledge of reproductive system (87.5%) compared to the pre-test score (6.4%) and the difference in knowledge was statistically significant (X^2=745.88 p<0.01). The results of Aderibigbe and Araoye (2008) on effect of health education on sexual behaviour of students of public secondary schools in Ilorin, Nigeria had a significant impact on reproductive system as there was an increase in knowledge of reproductive organ from 6.4% to 87.5%. This showed that health education plays an important role in the development of adolescents. The similarities in these study could be as a result of the similarities in the study population as they all used adolescents. Secondly, the similarities could also be attributed to the type of intervention used. Thus, the finding of this study had brought to fore the need for blended learning in the educational system to compliment the efforts of conventional classroom teaching to bring about the desired change in teaching.

The result of the study in Table 4.2 indicated a large effect (29.56±4.59) of health education intervention on puberty and menstruation which was statistically significant (p<0.05). Also respondents from the intervention experienced a higher mean knowledge (29.56±4.59) after intervention programme. This finding of this study is comparable to findings of Mbizvo et al. (1997) on the effect of a randomized health education intervention aspects of reproductive health knowledge and reported behaviour among adolescents in Zimbabwe showed that respondents in the intervention group experienced a significant (p<0.05) increase in knowledge of menstruation following intervention. The result of the study is also in line with the findings of Etemad et al. (2009) on impact of health education program on reproductive health knowledge among adolescents: a school based intervention study in Assuit, Upper Egypt revealed that the mean score of knowledge on the signs of physical changes during occurring in boys and girls at puberty improved significantly from (0.8435±0.789 to 4.838±2.641 for changes in boys; 1.34±0.556 to 2.76±0.700 for changes in girls) and was statistically significant (t= 2.75, p<0.05 and X^2= 117.57, p<0.01). This is also in agreement with Aderibigbe et al. (2010) on effect of health education on sexual behaviour of students of public secondary school in Ilorin, Nigeria showed that there a statistically association between having fair/good knowledge and good practices (p<0.01) after intervention. Malleshapa et al. (2011) conducted a study on knowledge and attitude about reproductive health among rural adolescent girls in Kuppan mandal: An intervention study showed that respondents' knowledge on puberty changes significantly improved after intervention (p<0.05). The study also showed that knowledge of menstruation and menstrual hygiene improved significantly from 78.3% to 96.4% and from 97.85% to 100% (p<0.05). Also Rao et al. (2008) on effectiveness: a school based intervention study in Udupi Taluk, Karnataka opined that respondents' knowledge on menstrual hygiene significantly improved from 77.2% to 95.6% and 91.8% to 100% respectively after intervention (p<0.0001). The similarities between the present study and the other previous study could as a result of the fact that the intervention were all school based and the design. There is thus, the urgent need for school managers and curriculum developers to include extra-curricular teaching and learning more especially on reproductive health.

The result of the study in Table 4.3 The study indicated a small effect of health education intervention on reproductive health knowledge based on age which was statistically significant at 0.05 alpha level. Also respondents from the intervention group aged 10-14 years and 15-19 years experienced a higher mean knowledge (110.06±4.01 and 110.03±3.92 respectively). This is as surprising as it is anticipated that the older people were expected to have more level of knowledge because of the level of exposure in terms of class room learning and teaching. The reason for the high knowledge among younger people may be that they are more interested in learning, greater attention, interest and participation in the health education activities compared to the older ones who are more exposed and multi-tasking.

The finding of the study is contrary to the finding of Leskshmi et al (2018) in a study on impact of sexual and reproductive health education programme in improving their knowledge among school going adolescents: a pilot study indicated that age had no significant impact on knowledge of reproductive health based on age (p=0.05). Also the findings of Mbizvo et al. (1997) in a randomized health education intervention on the aspect of reproductive health knowledge and reported sexual behavior among adolescents in Zimbawe revealed that older participants aged 15-19 years had more reproductive health knowledge after the intervention was carried out.

The result of the study in table 4.4 indicated a medium effect (0.76) of health education intervention on reproductive health based on gender compared which was statistically significant at 0.05 alpha level. The study also revealed that respondents in the intervention group male and female had a higher mean knowledge score of 110.45±4.86 and 111.12±2.91 respectively as compared to the control group 89.73 and 94.17 respectively. The knowledge level of the respondents in the intervention group were affected intensely over the period of the six weeks intervention. The likely reason also could be the difference in age range of the participants. This is comparable to the findings of Rahman et al. (2011) on knowledge of sexual and reproductive health among adolescents attending school in Kelantan, Malaysia revealed that the mean knowledge were significantly higher among females than males. Also a study on sexual behavior and knowledge of reproductive health and HIV prevention among secondary school students in Nigeria revealed that females had slightly higher mean knowledge of reproductive health than their male counterparts (38.4 ±7. 7 vs 37.8 ± 7.5) with statistically significant of 0.05 alpha level (Hassan et al. 2015).

A dissimilar pattern of result was obtained in the findings of Madeni et al (2011) evaluation of reproductive health awareness program for adolescence in urban Tanzania-A quasi-experimental pre-test post-test research revealed that there was an increase in knowledge of reproductive health among boys and girls after the intervention program (7.0 and 6.8) respectively. Also, the boys mean score was higher than the girls mean score which indicated a significant increase among both genders (t=45, p=.000 and t=7.9, p= .000) respectively. Also Madeni et al (2011) in a study on evaluation of a reproductive health awareness program for adolescence in urban

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Tanzania-A quasi-experimental pre-test post-test research opined that males had higher mean knowledge that female after post intervention with a statistically significance of 0.05 alpha level (t=4.5, p=0.000 and t=7.9, p=0.000 respectively).

CONCLUSION

This study has demonstrated that health education among adolescent can be a useful strategy to improving their sexual and reproductive health in our present day society. Health confers improvement in health literacy which is a continuum of learning and this in turn improves the ability to understand and follow medical advice for health and wellness overall. It would not be far fetched to expect improvement in the quality of life, self- esteem and could lower health care cost.

Recommendations

Based on the finding of this study, the following recommendations were postulated:

1. Teachers of senior secondary schools should periodically use mixed teaching method to better incorporate old and young adolescents to increase better reproductive outcomes.
2. School managements of secondary schools should periodically invite guest lecturers to give health talks to students outside the normal student learning process so as to increase the knowledge of reproductive health.

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