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RANDOMIZED CONTROLLED TRIAL OF PSYCHOEDUCATION INTERVENTION ON SEXUAL HEALTH LITERACY AMONG ADOLESCENTS AT RISK OF HIV IN AKWA IBOM STATE, NIGERIA[i]

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Abstract:
This study evaluated the effectiveness of psychoeducation intervention in enhancing sexual health literacy (SHL) among adolescents at risk of HIV. Sixty adolescents aged 12-19 years ($\bar{x}$=15.2) who reported low in Dilorio et al. (1993) Safe Sex Behaviour Questionnaire (SSBQ) were recruited from two secondary schools in Akwa Ibom State, Nigeria, and randomly assigned to treatment and waiting-list group. The intervention group received seven sessions of group-based psychoeducation intervention aimed at improving their HIV/AIDS knowledge, attitude toward HIV Counselling and Testing (HCT), as well as the attitude toward contraceptive use. Participants in the waiting-list control group were not exposed to the intervention. Results show that psychoeducation was effective in improving the sexual health literacy of participants ($F(1,59) = 7264.742$, $p<0.05$). Further, there was no interaction effect of gender on the treatment outcome. This outcome suggests that psychoeducation is a viable intervention for enhancing sexual health literacy aimed at reducing HIV new infections among the adolescent cohort. Psychoeducation intervention is, therefore, recommended as an effective treatment to curb new HIV infection among adolescents.

Keywords: HIV at-risk, adolescents, risky sexual behaviours, sexual health literacy, psychoeducation

[i] ESSAI CONTRÔLÉ RANDOMISÉ DE L'INTERVENTION DE PSYCHOEDUCATION SUR LA LITTÉRATION SEXUELLE DE LA SANTÉ PARMI LES ADOLESCENTS AU RISQUE DE VIH DANS L'ÉTAT IBOM AKWA, NIGERIA

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Résumé :
Cette étude a évalué l'efficacité de l'intervention psychoéducative pour améliorer la littératie en santé sexuelle (SHL) chez les adolescents à risque de VIH. Soixante adolescents âgés de 12 à 19 ans ($x^- = 15.2$) qui ont déclaré un faible taux de Dilorio et al. (1993) Questionnaire sur le comportement sexuel sûr (SSBQ) ont été recrutés dans deux écoles secondaires de l'État d'Akwa Ibom, au Nigéria, et affectés au hasard à un groupe de traitement et de liste d'attente. Le groupe d'intervention a reçu sept séances d'intervention psychoéducative en groupe visant à améliorer leurs connaissances sur le VIH / SIDA, leur attitude envers le conseil et le dépistage du VIH (HCT) ainsi que leur attitude envers l'utilisation des contraceptifs. Les participants au groupe témoin de la liste d'attente n'ont pas été exposés à l'intervention. Les résultats montrent que la psychoéducation a été efficace pour améliorer la littératie en santé sexuelle des participants ($F(1,59) = 7264,742$, $p < 0,05$). De plus, il n'y a eu aucun effet d'interaction du sexe sur le résultat du traitement. Ce résultat suggère que la psychoéducation est une intervention viable pour améliorer la littératie en santé sexuelle visant à réduire les nouvelles infections à VIH parmi la cohorte des adolescents. L'intervention psychoéducative est donc recommandée comme traitement efficace pour limiter la nouvelle infection à VIH.

Mots-clés : VIH à risqué , adolescents , comportements sexuels à risqué , littératie en santé sexuelle , psychoéducation

1. Introduction

Health literacy is the cognitive and social competencies that determine the motivation and ability of an individual to gain access to, understand, and use information in ways that promote and maintain good health (Nutbeam, 1998; Ofole, 2016).). Based on this concept of health literacy, sexual health literacy is defined as the self-perceived ability of an individual to access needed sexual and reproductive health information, understand, appraise it and apply the information to make informed sexual health decisions (Dabiri, Hajian, Ebadi, Zayeri, & Abedini, 2019; Ofole, 2019).). World Health Organization (WHO) positioned health literacy as the key mechanism to meet the health-related Sustainable Development Goal (SDG3) (UNDP, 2020). Studies show that limited sexual health literacy among adolescents can contribute to adverse negative effects such as sexually transmitted infections (STIS) and Human Immuno-Deficiency Virus (HIV) (Keto, Tilahun, & Mamo, 2020).

HIV/AIDS constitutes a major public health threat in Nigeria despite the concerted efforts of Federal Ministry of Health, National Agency for the Control of AIDS, Nigeria Drug Law Enforcement Agency as well as other relevant civil society organizations. There is increasing concern in the growing disproportionate share of adolescents and young people living with HIV/AIDS in Nigeria. With a 1.4% prevalence rate among individuals aged 15–49 years, Nigeria ranks third among countries with the

highest burden of Human Immuno-Deficiency Virus (HIV) infection in the world and has the highest number of adolescents and young people aged 0-19 years living with HIV in West and Central Africa with estimate of 190,000. Further, one in 20 adolescents out of the estimated Nigeria population of 191,835,936 contract sexually transmitted infections each year, and half of all cases of HIV infection take place among people under the age of 25 years (UNAIDS, 2019).

Behaviours and conditions that predispose individuals to HIV/AIDs include having unprotected anal or vaginal sex. According to Mohammed and Usman (2020), a significant population of adolescents in Nigeria aged 15-19 years are sexually active and the median age at sexual debut was 15 years. These adolescents are also reported to be involved in unprotected sexual activities with multiple partners thereby exposing them to negative reproductive health consequences (Nmadu et al., 2020). Early sexual initiation can be associated with unsafe sexual practices which can lead to adverse health outcomes including HIV infection and STIs, unwanted pregnancy, and abortions (Yaya & Bishwajit, 2018). Despite this high prevalence of HIV, a recent study by Badru, Mwaisaka, and Khamofu (2020) using young adolescents from Akwa Ibom show significantly low levels of comprehensive HIV knowledge, negative attitude towards HCT, and low-risk perception. The recent report by Statista Research Department (2022) confirms this trend. It revealed that only roughly 36 % of young people in Nigeria have comprehensive knowledge of HIV transmission. Similarly, other studies (Yaya et al. 2018; Fasoranti, Onwuama, & Toluwalase, 2018) reported limited sexual and reproductive health literacy. Fasoranti et al. (2018) suggested that health-related knowledge in Nigeria needs more attention so that it can attain the global target to end HIV epidemics and other diseases by 2030. For these reasons, health educators and public health officials continue to seek effective methods to reduce the incidence of early sexual debut and high-risk sexual activity among young adolescents. A common approach over the years is a classroom-based sexual education curriculum which has been documented to focus on abstinence-only interventions (Borawski et al., 2005). Evaluation of the outcome of these abstinence-only interventions shows that it improved knowledge, beliefs, and intentions but may not translate to a change in HIV risk behaviours (Elaine et al., 2014).

Research has shown that psychoeducation intervention has the potency to modify behaviours that are deficit, inappropriate, or excessively manifested. Psychoeducation interventions encompass a broad range of activities that combine education and other activities such as counselling and supportive interventions. Psychoeducational interventions may be delivered individually or in groups, and may be tailored or standardized. Psychoeducation was in this study as group therapy to provide the participants with knowledge about various aspects of HIV including HIV counselling and testing (HCT), STIs prevention and treatments, etc. It is documented that psychoeducation is effective in reducing anxiety in adolescents (Morgado, Lopes, Carvalho, & Santos, 2022; Luque, et al., 2022) and managing young people with a high risk of depression, their families, and caregivers (Bevan-Jone et al., 2018). However, evidence of the benefits of group psychoeducation in enhancing sexual health literacy is

still scarce. It is envisaged that the outcome of this study will provide pertinent literature that will give directions to tackle the problem of HIV risky behaviours in adolescents globally and Nigeria specifically. In addition, the finding is expected to provide empirical data that will guide stakeholders (government, NGOs, school management) in designing programs and interventions targeting adolescents.

2. Methods

2.1 Study Location

This study was conducted in two public secondary schools located at Ibesikpo Asutan Local Government Area (LGA) of Akwa Ibom state, Nigeria. Akwa Ibom is one of the States in South-South geo-political zones in Nigeria. It was purposely selected for the study. The justification for this non-randomization of states for the study was due to the fact as at the time of conducting this study Akwa Ibom State has the highest number of people living with HIV in Nigeria (5.5 %) and this figure is about 3 times higher than the National prevalence of 1.4 %. Moreover, Akwa Ibom State along with three other states (Benue, Rivers, and Taraba) has consistently been in the top four states in Nigeria with the highest prevalence of HIV for the past ten years (Nigerian HIV/AIDs Indicator and Impact Survey (NAIIS), (2019). Further, a recent study by Badru, e al. (2020) using young adolescents from Akwa Ibom State shows that they have a significantly low level of comprehensive HIV knowledge and negative attitude towards HCT despite being the State with the highest HIV prevalence in Nigeria. This portends the need to target the State with intervention to prevent new HIV infection.

2.2 Design

This study adopted a pretest, posttest, and control group experimental design with a 2x2 factorial matrix. The column consists of the treatment and waiting-list control group while the row was webbed with the moderating variable – gender at two levels (male and female). The two public secondary schools with similar class sizes, teacher-student ratios, and other similar characteristics were randomly assigned to treatment conditions. The schematic representation of the study design is represented thus.

Table 1: Schematic representation of treatment conditions

0_1	X_1	0_3
0_2	X_0	0_4

Where**:**
0_1, and 0_2 are pre-tests;
0_3, and 0_4 are post-tests;
X_1 = Intervention with Psychoeducation;
X_0 = Control group = No treatment administered.

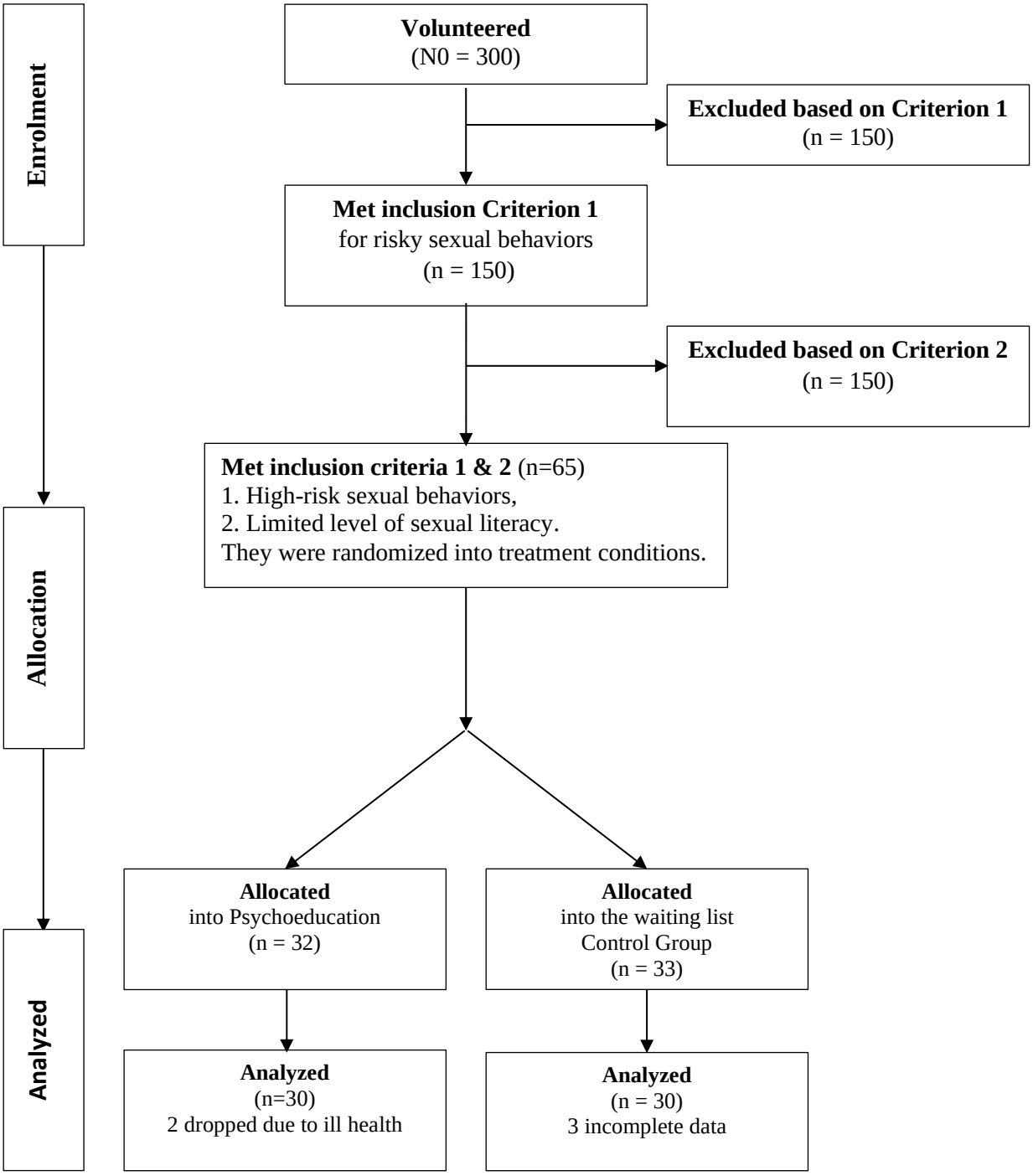

Figure 2: Diagram showing the participant's flow chart

2.3 Participants

The participants consist of 60 adolescents aged 12-19 years who met the inclusion criteria. Only Senior Secondary Schools 1 & 11 (SS 1&11) participated in the study. Senior Secondary 111 (SS3) students were excluded because they were preparing for two University qualifying examinations (West African Examination Council and National Examination Council Examination). The participants who met the two inclusion criteria were enrolled in the study in phases. The two inclusion criteria were: (1) those who scored

low score on risky sexual behaviour using DiIorio, et al. (1992) Safe Sex Behaviour Questionnaire (SSBQ) and (2), those with limited health literacy level as obtained from Pelikan, et al. (2017)'s Health Literacy Scale. The participant's flow is presented in Figure 1.

2.4 Procedure

The researcher who is a counseling psychologist with a specialization in instructional psychology developed the psychoeducation intervention manual tailored toward the adolescent's developmental needs. Two research Assistants who have Master's degrees (MEd) in Adolescent and Youths counselling from the University of Ibadan supported the researcher during the delivery of the manualized intervention. A total of seven sessions were held in 7 weeks for the experimental group. The duration for each session was ninety minutes (90). Participatory methodologies (role play, music, songs, drama) were utilized to deliver the sessions. The instruction slides were embedded with relevant videos and images. In the first session, rapport was established and participants were oriented about the intervention. They were specifically informed about the purpose of the intervention, its duration, and the rationale for the intervention. Ground rules to guide the sessions were also set and baseline data were collected from both the treatment group and wait-list control group using Vongxay et al. (2019) Sexual reproductive Health literacy (SRHL) questionnaire.

The second session was used to provide scientific information regarding basic adolescents' reproductive health (ARH). Topics covered in session two includes sexually transmitted infections, HIV/AIDS, menstruation, ovulation, and conception. The session was also utilized to discuss the consequences of premarital sex, and prevention methods (condoms, contraceptives). In the third session, the adolescents were exposed to three psychological concepts (self-esteem, body image acceptance, emotional intelligence) and which are reported to be protective factors against risky sexual behaviours. In the fourth session, the participants were empowered with problem-solving skills (how to solve life problems including sexual health-related ones, HTC, STI screening, and treatments).

The participants' communication skills (refusal skills, negotiation, and assertiveness skills) were strengthened in the fifth session. The sixth session was utilized to model life skills (value clarifications, boundary setting, decision making, conflict resolution, and emotional awareness) and the participants rehearsed the skills. In the seventh session, the researcher reviewed the preceding six sessions. The participants were also appreciated, and post-intervention data were collected by Vongxay et al. (2019). The waiting-list control group had no intervention but data was collected from the group prior to intervention and after the intervention. They were also compensated with a lecture on composition writing.

2.5 Measures

2.5.1 Risky Sexual Behaviours Screening Tool

Safe Sex Behaviour Questionnaire (SSBQ) by Dilorio et al., (1993) was used to screen out 150 adolescents who reported having been engaged in risky sexual behaviours. The instrument is a 27-item self-administered questionnaire that was designed to measure adolescent sexual behaviours, condom usage, high-risk behaviours, sexual communication, and negotiation. Typical items in the scale include: "*I engage in sexual intercourse on a first date"* and *"I engage in anal intercourse without using a condom*" The response format was a 4-point Likert scale (1=never, 4=always). Ten items were negatively worded 7 were positive statements. The negative items were marked in reverse form and vice versa for the positive items. Those who scored above 35 were excluded from the study as the norm of the scale stated that such groups have safe sex behaviour.

2.5.2 Health Literacy Screening instrument

Pelikan, et al. (2017)'s health literacy scale was used to screen participants who met the second inclusion criteria (limited health literacy). The instrument was developed and validated by Pelikan, et al. (2017). It has 16 self-report items which focused on perceived difficulties/ease in accessing, understanding, appraising, and applying health information across domains of health care, disease prevention, and health promotion. The item response is designed in Likert format (very easy (4), easy (3), difficult (2), and very difficult (1). The mean score was calculated for all items on the scale, and then it was converted to an index using the Health Literacy Index formula as recommended by the European health literacy consortium. Health Literacy Index score = (mean-1) * (50/3), where mean is the average of items on the scale, 1=the minimal value of the mean, 3=the range of the mean, and 50=the chosen value of the new index score (Sorensen, et al. 2012). The index scores were recorded into four health literacy categories as per the threshold established by HLS-EU consortium (e.g., the knowledge, motivation, and competencies to access, understand, appraise and apply health information in order to make judgments and take decisions in everyday life concerning health: excellent (>42-50); sufficient (>33-42); problematic (>25-33); and inadequate (0-25). Later, health literacy was recategorized into limited (inadequate and problematic health literacy) and adequate health literacy (sufficient and excellent health literacy) (Bhusal et al., 2021: Sorensen et al., 2015). Those who were categorized as having adequate health literacy were excluded from the study. While only participants who have limited (inadequate and problematic) health literacy participated in the study.

2.6 Criterion Measure

Both the intervention group and waiting-list group completed the Sexual reproductive Health literacy (SRHL) questionnaire (Vongxay et al., 2019) at baseline and two weeks after termination of therapy. The SRHL is a 39 item self-report tool for the measurement of the health literacy of adolescents aged 15–18. The questionnaire has five parts namely:

(1) sociodemographic information, (2) personal health information, (3) information sources, knowledge, behaviour, and attitude related to teenage pregnancy, contraceptives, and abortion (4) SRHL, (5) and functional/ condom literacy. The functional literacy subsection was adapted to HIV/AIDS education, attitude towards HCT, and STIs treatment. In the questionnaire, participants were asked to indicate how easy it was for them to undertake sexual health-related activities using very (1) difficult (2), difficult (3), easy (4), and very easy (5). Typical items include: *"How easy is it for you to find information about HIV /AIDS, HCT, contraceptive methods", "to judge how to avoid unintended pregnancy?* The Cronbach's alpha coefficient for the entire scale was .093. Thus, SRHL-Q was considered valid and reliable to be used for adolescents in Nigeria.

2.7 Ethical Considerations

The approval for this study was obtained from the Akwa Ibom State Secondary Education Board (SSEB) through the School Principals of the Schools who participated in the study. The nature of the study does not have potential health harm to the participants. To avoid violation of informed consent, the participants were informed of the aims and objectives of the study. They signed the consent form provided by the Researcher. They were also informed that they have the opportunity to *opt-out from the study* should they find any aspect of the research not acceptable to them. They were also assured of confidentiality. All information that could link their responses to their identity was removed from the questionnaire's codes used in the questionnaires. The researcher also promised to share the outcome of the research with the participants.

2.8 Data Analyses

Statistical analysis was performed using IBM SPSS version 25. Categorical variables were presented as frequencies and percentages. The health literacy score was summarized as means and standard deviations. The treatment effect was determined with analysis of covariance (ANCOVA). The level of statical significance was set at 0.05 two-tailed for all the tests.

3. Results

3.1 The Sample Characteristics

In all, sixty students aged 12-19 years participated in this study. The mean age of the participants was 15.2 years. An equal number of males and females participated in the study (males=30; females=30). Of the 60 participants 8 representing 13.4 percent of the sample were in the age range of 12-13 years, 14 participants (23.3%) were between 14 to 15 years, 18 (30%)) were in the age range of 16 to 17 years while 20 (33.3%) were in the age range of 18-19 years (33.3%) With regards to participant's religious background, the result shows that 27 representing 45% of the study sample were Christians while the Muslim consist was 26 (43.3) and other religions were 7 (11.7%). The participants' parent's socio-economic status as assessed by Salami (2000) shows that 8 representing 13.3 percent

of the study sample were from a high socio-economic background while 20 came from medium socio-economic background. The remaining 32 representing 53.3 percent of the study sample came from low socio-economic backgrounds. The summary of the participants' profiles is presented in Table 1.

Table 1: Demographic profile of respondents

S/N	Variable	N = (60)	Percentage (%)
1	**Gender**		
	Female	30	50
	Male	30	50
2	**Age Range**		
	12-13	8	13.4
	14-15	14	23.3
	16-17	18	30
	18-19	20	33.3
3	**Religion**		
	Christians	27	45
	Muslims	26	43.3
	Others	7	11.7
4	**Parent's SES**		
	High	8	13.3
	Medium	20	33.4
	Low	32	53.3

RQ1: Descriptive statistics were used to summarize the pre-test and post-test mean scores of adolescents exposed to psychoeducation intervention and the control group. The result is displayed in Table 2. It shows that the mean difference for the treatment group is higher ($\bar{x}$=20.96) when compared with the mean difference for those in the waiting-list Control group ($\bar{x}$ =7.02).

Table 2: Mean and standard deviation of pre-test and post-test scores of adolescents exposed to psychoeducation intervention and control group

Treatment Group	Test Type	N	Mean	SD	Mean difference
Psychoeducation	Pre-test	30	11.68	0.62	20.96
	Post-test	30	32.64	1.1	
Control Group	Pre-test	30	11.7	1.21	7.02
	Post-test	30	18.72	1.25	
Total		60			

$H0_1$: Analysis of Covariance (ANCOVA) was utilized to test if there is a statistically significant main effect of psychoeducation intervention on the study participant. The pre-test scores were used as a covariate to ascertain if there is a statistically significant difference in the post-intervention scores. The result is presented in Table 3.

Table 3: Analysis of covariance (ANCOVA) for pre-test and post-test mean scores of psychoeducation intervention and control group

Sources	Sum of Square	df	Mean Square	F	Sig
Corrected Model	12489.215a	2	6244607.5	5411.511*	.000
Intercept	1337.263	1	1337.263	855.210*	.000
Groups	11625.874	1	11625.874	7264.742*	.000
Error	102.511	58	1.767		
Total	197352	60			
Corrected Total	12092.733	59			

a. R Squared = .908 (Adjusted R Squared = .804) * P < 0.05

The result presented in Table 3 showed that there was a statistically significant difference between the pre-test and post-test mean scores of participants exposed to psychoeducation intervention and those in the control group ($F_{(1,59)} = 7264.742$, $p<0.05$). Thus, the null hypothesis was rejected. This suggests that the intervention was effective in enhancing the sexual health literacy of the participants.

$H0_2$: There result of the ANCOVA analysis which hypothesized that there will be no significant interaction effect of gender on sexual health literacy of participants exposed to psychoeducation intervention is presented in Table 4.

Table 4: Two-way analysis of covariance of the effect of gender on the sexual health literacy of participants exposed to psychoeducation intervention

Source	Sum of Square	df	Mean Square	F	Sig
Corrected model	73.552a	3	24.517	72.724	.000
Intercept	104413.402	1	104413.402	320432	.000
Gender	0.174	1	0.174	0.36	.374
Sexual health literacy	62.442	1	62.442	105.425	.000
Gender * S. Health literacy	0.214	1	0.214	0.126	.425
Error	42.01	56	0.75		
Total	134200.111	60			
Corrected Model	140.546	59			

a. R Squared = .764 (Adjusted R Squared = .701) * P < 0.05

The result ($F_{(1,59)} = .126$, $p>0.05$) displayed in Table 4 showed that there was no interaction effect of gender on the outcome of treatment hence the null hypothesis was rejected. The possible implication of this result is that the participant's gain in the intervention was irrespective of their gender.

4. Discussion

The outcomes from the study suggest that psychoeducation intervention was effective in enhancing the sexual health literacy of adolescents who are at risk of HIV. This outcome corroborates the evidence that psychoeducation intervention has the potency to improve health literacy among diverse populations (Morgado, et al., 2022; Luque, et al., 2022;

Ofole, 2021). This congruency may be explained by the fact the researcher utilized participatory methods which are reported to enhance the treatment benefits of psychoeducation intervention (Jibunoh & Ani, 2022). The treatment efficacy could also be attributed to the treatment package which was specifically tailored to the adolescents' developmental stage (Jibunoh et al., 2022). It is not surprising, therefore, that the wait-list control group's level of sexual health literacy remained unchanged. They could be a result of the fact that though they were recruited, randomized, screened, and measured they were denied treatment (Gallin & Ognibene, 2012). The practical implication of this finding is that participants in the experimental group are more likely to adopt safe sexual behaviours which will not result in HIV / AIDS compromising behaviours due to the increased level of health literacy unlike their counterparts in the control group.

Another outcome of this study is that there was no interaction effect of gender on the participants' sexual health literacy. This outcome implies that psychoeducation could be utilized for all adolescents irrespective of their gender. This finding contradicts the evidence of Reichhart, et al. (2009) who reported that male caregivers and patients benefited significantly better from psychoeducation than their female counterparts. It also negates the finding reported by Tomita et al. (2019) which shows that female patients performed better in depression comprehension following a psychoeducation intervention. Thus, this negative finding should not be overgeneralized to imply that tailoring psychoeducation to a specific target population may not be effective. The current study was conducted using only a cohort of adolescents with self-reported risky sexual behaviours and a short session of psychoeducation intervention was delivered without follow-up.

5. Limitations and Strengths

The major strength of this study is that it was able to establish a cause-effect relationship between the predictor variable (psychoeducation intervention) and the criterion variable (sexual health literacy). However, there were limitations that may restrict the generalizability of the study to some contexts. One such limitation is that experimental research of this nature is prone to an error caused by extraneous variables. Though the researcher rigorously controlled this error by using randomization to enlist the participants into treatment conditions as well as the use of ANCOVA for data analysis. ANCOVA has the potency to control for factors that cannot be randomized but have been measured in the interval scale. Another limitation was the collection of data using self-report measures which has the tendency of introducing social desirability factors. Human responses can be difficult to measure, and participants may also cause bias this notwithstanding the researcher ensured that the responses of participants were devoid of identifiers to mitigate this issue.

6. Implications for Practice

The main purpose of the study was to address the limited research evidence on an effective method of reducing insufficient sexual health literacy among adolescents with risky sexual behaviours. This was done by manipulating both psychological variables and education(psychoeducation) delivered with participatory methodologies. Accordingly, the first practical contribution of the present research is that it has provided much-needed empirical data on the effectiveness of psychoeducation intervention in enhancing the sexual health literacy of adolescents in Akwa Ibom State, Nigeria. It is also believed that this research is timely in the face of the increasing rate of new HIV infection in Akwa Ibom State. A second implication that stems from this study is that this intervention could be administered to both males and females as the outcome suggests no gender difference in high-risk behaviours

7. Conclusion

In conclusion, psychoeducation intervention was effective in enhancing the sexual health literacy of adolescents who are at risk of HIV in Nigeria. With sexual health literacy, adolescents are better equipped to deal with risky sexual behaviours which predispose them to HIV. Further, the outcome suggests that psychoeducation intervention should not be sex-oriented. Despite the rigorous measures adopted to prevent extraneous variables from contaminating the outcome of this study, it should be generalized with caution.

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Conflict of Interest Statement
The author declares no conflict of interest.

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