



Overview of HIV Risk Reduction Interventions among Adolescents - A Call to Evaluate the HIV Education Curriculum in Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. Author AFC designed the study and author AEN performed the statistical analysis. The literature searches were managed by authors CJC and HNC while the protocol and the first draft of the manuscript were written by author POUA. All authors read and approved the final manuscript.

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ABSTRACT

Background: Adolescence is typically a period of experimentation, new experiences, and vulnerability which influences their HIV risk behaviours. Some may out-grow many risk behaviors, yet prevention efforts are needed to reduce the risk of HIV infection during this period. Knowledge about risk is not sufficient for the prevention of HIV risk behavior. This review examines the existing types of education targeted at reducing HIV risk and their application to adolescents for optimal outcome.

Methodology: Keywords from objectives of review were used to search for related literatures through online libraries of national and international journals. Out of 60 related studies initially generated, 38 literatures were selected for review.

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Results: School-based health services should ideally be complementary rather than replacement option for the provision of health care services for adolescents. Interventions to improve HIV knowledge and reduce risky sexual behaviour may need to specifically target adolescents. The types of HIV risk reduction education intervention among adolescents is classified into peer-based and health provider-based education. Given the complexity of factors that contribute to risk behavior, prevention efforts that focus exclusively on knowledge are unlikely to be successful. Effective school-based (youth-targeted) HIV prevention programs, which typically rely on principles of social cognitive (Learning) theory could be employed to bridge the gap.

Conclusion and Recommendations: With this in mind, a comprehensive review of the Family life and HIV education (FLHE) programme in Nigerian secondary schools is long overdue.

Keywords: Overview; HIV; risk reduction; health education.

1. BACKGROUND

The World Health Organisation (WHO) [1] identifies adolescence as the period in human growth and development that occurs after childhood and before adulthood, from ages 10 - 19 years, and millions in this group who are becoming sexually active, live in countries with a high burden of HIV [1]. In Nigeria, majority of this age group are within the secondary school age (junior secondary school 1 to senior secondary school 3). Adolescence is typically a period of experimentation, new experiences, and vulnerability which influences their behaviours regarding HIV risk. Such behaviours include experiment with vices such as drug and alcohol abuse, sexuality, and sexual mal-orientation (men may begin to have unprotected sex with other men), unprotected sex for gain, and some falling victims of sexual [1].

Although some adolescents may out-grow many risk behaviors, prevention efforts are needed to reduce the risk of HIV infection during adolescence. As has been found with other risk behaviors, studies have demonstrated that knowledge about risk is not sufficient for the prevention of HIV risk behavior [2,3]. This is not really surprising, given the variety of individual and contextual factors that contribute to motivation and the persistence of risk behaviors into young adulthood [3]. Other contributing factors are problems in relationships with parents, friends' misbehaviors, stressful events, and neighborhood violence and unemployment [3].

Overall it appeared that a significant proportion of adolescents remained underserved and school-based health services should ideally be a complementary strategy and not a replacement option for the provision of health care services for adolescents [4,5]. Interventions to improve HIV knowledge and reduce risky sexual behaviour

may need to be specifically targeted and tailored to adolescent populations with knowledge, attitudes, skills, sexual activity and condom use as expected outcome measures [6]. This review examines the existing types of education targeted at reducing HIV risk and their application to adolescents and youth for optimal outcome.

2. METHODOLOGY

Keywords from objectives of review are 'Overview; HIV; Risk reduction; Health Education' which were used to search for related literatures through online libraries of national and international journals; Medline and PubMed including google. About 60 related literatures/studies were initially generated and then 38 literatures were selected which met the inclusion criteria and related to objective of review.

3. TYPES OF HIV RISK REDUCTION EDUCATION INTERVENTION AMONG ADOLESCENTS [6,7]

There are two descriptions of HIV risk reduction intervention; Descriptions of modes of intervention delivery; and who delivers the intervention.

3.1 Modes of Intervention Delivery

1) School-based HIV prevention education; 2) School-based health services; 3) Delivery of services (e.g. HIV testing, condoms) in youth centres; 4) Increasing adolescents' utilization of HIV prevention methods (e.g. HIV testing, condoms use) by making health services more acceptable to adolescents; 5) Community-wide interventions for adolescents and young people living within geographically- defined communities; 6) Conditional cash transfers (CCTs) to adolescents who stay in school; 7)

Conditional cash transfers (CCTs) to adolescents who remain STI-free' 8) Unconditional cash transfers (UCTs) to adolescents. Laud et al. [7] further suggest that school-based interventions can be classified into; adult-led versus peer-led, curriculum-based versus non-curriculum-based and interventions with and without characteristics of effective curriculum-based intervention. Mavedzenge et al. [6] added that school-based interventions can be effective on knowledge, self-reported attitudes and skills, if they contained certain key characteristics like delivery by trained facilitators, multiple-session programs, curricula that include skills and knowledge building activities, and programs that are designed appropriately to the context.

3.2 Description of who Delivers the Intervention

3.2.1 Peer-based HIV education interventions

This entails the use of peers who can be within or outside the school environment to deliver education on HIV to fellow adolescents. The use of peer educators as alternative to teachers or other adults have been advocated because it is believed that peer educators are able to communicate better with fellow young adults than they would with older adults [7]. However, peers may be unlikely to be familiar with these topics or to demonstrate reasonable skills needed to deliver the curriculum content [6]. Still, adequate training of peers may be all that is needed to achieve good result in a peer-led intervention. Peers can communicate HIV education through plays and debates in a non-curriculum format. However, the expected yearly student turnover and subsequent requirements for frequent training and supervision raise doubts about the sustainability and cost-effectiveness of using peer educators [6,7]. Studies have shown that in both peer-educated students, HIV/AIDS information was received mostly from radio and friends which showing that students preferred to get information from their age mates [8,9]. Also friends were most often mentioned by adolescents to discuss sensitive topics with [7]. The peers are empowered to discuss the issue of sexual matters and AIDS with their schoolmates openly using their own adolescent language [9].

3.2.2 Health provider-based intervention

This is one of the adult-based education interventions among others which include; school teacher, parents, trained facilitator, policymakers and religious leader [7]. Health providers like

other adults, are mainly the implementers of curriculum-based interventions, because they have more experience, knowledge and skills needed [7]. The adults are teachers who should be most suitable in educational settings, and with sufficient training, interventions are more often than not quite replicable [7]. However these teachers may show seeming discomfort in use of interactive teaching methods and reluctance to discuss sensitive topics such as adolescents' sexual behaviours. These limitations might justify the use health workers in health provider-based intervention or other local experts to teach these students. This is because these experts may be more knowledgeable about the subject area and may more confidently discuss the topics with the adolescents. However, logistical and other resource challenges may hinder the effective delivery of required teaching by the experts to students in the various schools [7].

3.3 Effect of Education on HIV Knowledge and Behavioural Risks among Adolescents

Many studies agree that the outcome measures of HIV/STI risk reduction education intervention include; biological; behavioural and knowledge/attitude outcomes [7,10-18]. Some have consistently reported that education interventions on STIs/HIV and their prevention show a positive change in knowledge and reported sexual behaviours [7,10]. In agreement with the reviews, other studies [7,19] have demonstrated significant HIV/STI knowledge gain and prevention practices in intervention studies. Thus measure of effectiveness of HIV risk reduction education intervention is discussed under three categories; impact on knowledge and attitude; impact on behaviour- which affects risks of transmission such as sexual behaviour, use of condoms, use of alcohol and drugs and sharing of sharps; and impact on the biological outcome which is HIV/STI prevalence [7,10,20].

3.4 Effect of Education on HIV Knowledge and other Psychosocial Factors Affecting Behaviours

3.4.1 HIV education intervention effect on HIV related knowledge

Studies have found that interventions could improve knowledge of STIs/HIV and their prevention [7]. However, knowledge of all items measured was not improved by the interventions

indicating that perhaps some curricular did not capture some required specific details. Nonetheless, all interventions identified in the studies showed a positive change in knowledge on one or more details as they relate to HIV/STI prevention which resulted in corresponding change in one or more of the outcomes assessed. Other interventional studies showed positive changes in knowledge which also resulted in change in outcome measures such as reported sexual behaviours [10,20-23]. This change among youths suggests that knowledge of HIV/STI could have some positive impact on sexual activity.

3.4.2 Effect on other psychosocial factors affecting HIV related behaviours

Aside knowledge, there are other mediating factors that affect risk behaviours, and these are known as psychosocial factors affecting behaviour [7,21]. These include; Attitudes and Values; beliefs-perceived risk/vulnerability, perceived severity, Perceived Peer behaviour and norms; self-efficacy and skill. This is in line with health belief model which states that behaviours are influenced by a person's belief and perception on influence of the disease on his life. Just as studies demonstrate increase in knowledge post intervention, positive attitude is also reported after intervention. According to Kirby et al. [21] some programs showed effective increase in perceived risk of HIV, while others increased awareness of HIV risk. Similarly, studies on abstinence, sex and condom use, showed more than 60% improvement following intervention [21].

Some other studies that assessed the effect of interventions on psychosocial factors, reported that, individual values and awareness of peer norms significantly influenced their sexual, alcohol or drug intake behaviours [7]. Discussions about sex and condoms or alcohol use that are recognized to be linked to protective behaviours and sexual risk can change the adolescents' behaviour on risks of HIV infection. The results though not easily measurable and reliable unlike knowledge, they still indicated that interventions have positive effects on values, attitudes, norms, skills and beliefs. Furthermore, the risk reduction interventions positively changed reported values about sex, values on someone being pressure to have sex, attitudes towards people living with AIDS, attitudes towards condoms, perceptions of peer norms regarding condoms, self-efficacy to obtain

condoms and to use them, self-efficacy to say no to have sex and plans to talk about condom use or to use a condom [21]. These studies demonstrate that HIV risk reduction intervention can markedly improve self-efficacy for critical risk avoidance behaviours. Similarly, a Chinese study measuring impact of school-based HIV education among adolescents found significant difference between intervention and control groups where attitudes towards daily contact with HIV-positive persons showed that interventions changed subjects' attitudes positively, and improved their protection self-efficacy [22]. A Nigerian study [10] showed that attitudes (perceived risk) towards people living with HIV or AIDS were significantly improved among intervention youth, compared to the comparison youth at six months post-intervention.

3.5 Non-Sexual HIV Related Behaviours

These are behaviours that influence HIV infection including; negative sexual decisions under alcohol or drug influence and sharing of sharps among injection drug user. Studies have reported decrease in the use of alcohol and drugs, right choice of condom use, avoidance of places and situations that might lead to sex among intervention group [7,21]. Conversely, a study on alcohol or drug use showed that a large majority found no reduction in use and that none of the three studies that measured alcohol or drug use before sex reported any impact [21]. This led to the conclusion that these discouraging results may actually be a reflection of the little emphasis placed by the program on alcohol and drug use reduction [21]. None measured impact on sharing of sharps among injection drug users.

3.6 Effect of HIV Education Intervention on HIV Related Behaviours

Behavioural risks for HIV infection could be discussed as sexually related and non-sexually related risks. Sexually related risks include; sexual activities and condom use while non-sexually related risk include activities that can influence behaviour leading to HIV infection such as use of alcohols and drugs and sharing of sharps. Kirby et al. [21,24-26] in different study reviews reported that sexually related behaviours that affect HIV transmission include; time at sexual initiation; frequency of sex; number of sexual partners; use of condom; and sexual risk-taking behaviours

3.7 Effect of HIV Education Intervention on Sexually-Related Behaviours

3.7.1 Initiation of sex

An important measure of sexual activity is timing of initiation of sex. The review on "Impact of Sex and HIV Education Programs on Sexual Behaviours of Youth in Developing and Developed Countries [21] "demonstrated that a significant percentage of programs delayed the initiation of sex with only one United States program hastening sexual initiation. About 42% of the studies that measured impact on the initiation of sex found that the programs significantly delayed the sexual debut among one or more groups for at least six months [21]. However, 55% found little impact with earlier sexual initiation. Among developing and developed countries' programs, 43% and 42% respectively encouraged delayed the sexual debut. Roughly equal percentages of programs were effective in school, clinic, and community settings and in both genders. A Chile study [10] demonstrated that the proportion of female subjects, in the intervention schools who reported sexual debut rose from 17% at baseline to 28% at 21-month follow-up and 30% at 33-month follow-up. The implication of this was that the program produced a statistically significant reduction in the rate of sexual initiation among females at intervention schools when placed side by side with females in the comparison schools and the same outcome was obtained among males.

3.7.2 Frequency of sex

This is simply explained as the frequency of sex during a specified period of time [21]. This includes not having sex or "practicing abstinence." According to Laude A et al [7], intent to stop having sex among the sexually experienced –were also demonstrated by all studies that measured impact on secondary abstinence. Generally, some programs did not affect frequency of sex while others reduced it [7,21]. Again some studies that measured impact of programs on sex frequency found it reduced, 61% had no effect, and only three found increased frequency. Both developing and developed countries had programs that significantly reduced the frequency of sex as recorded in schools, clinic, and community settings, among both males and females.

3.7.3 Number of sexual partners

This is another common measure of sexual activity. Results from this indicated that in general, programs did not increase the number of sexual partners but some decreased it instead [21]. Again programs were equally effective in both community and school settings and with both males and females, but they tended to be somewhat more effective, the younger the adolescent was. A Ugandan study [10] demonstrated that between baseline and follow-up, a statistically significant proportion of responding youth from the intervention areas reported a reduced number of sex partners compared with respondents from comparison areas. Among males aged 15 to 24 years, the proportion of intervention group reporting two or more partners decreased from 45% at baseline to 32% at follow-up as opposed to a rise from 45 to 59% among the control group. Similar findings were recorded for females of comparable age group. Also a Nigerian study [10] among school-based adolescents reported a significant difference in the mean number of sexual partners by the sexually experienced intervention youths at six-month follow-up, compared to control group counterparts. Another study across six Nigerian states reported that more respondents in the comparison group (15.4%) having multiple sexual partners than their counterparts in the intervention group (9.7%) [20].

3.7.4 Effect of HIV education on condom use

Worldwide, almost half of studies that measured program impact on condom use found increased condom use with none of them finding decreased condom use [21,24-26]. The proportion of effective programs in developing countries was similar to the proportion in the developed countries in both school and community settings, irrespective of gender and age of populations [21]. A study conducted in Dominican Republic [23] found that respondents who reported receiving sex education were about 3 times more likely to report currently using condoms than respondents who reported not receiving sex education. Another study found that use of condom rose from 15% at baseline to 25% at follow-up among males in the intervention areas; but ever use of condoms also rose among males in the comparison areas (from 15 to 21%) [10].

3.7.5 Effect of HIV education on sexual risk-taking behaviour

According to Kirby et al. [21], some studies developed composite measures of sexual activity and condom use, such as “frequency of unprotected sex” or “number of unprotected sexual partners.” These measures are strongly related to HIV/STI transmission. Half of them found significantly reduced sexual risk-taking. None of them found increased sexual risk-taking.

In addition, just as adult-led interventions had a positive effect on at least one of the reported sexual or protective behaviours, peer-led interventions also showed one or more behaviours that had a positive impact on adolescents. Thus results from Laud et al review [7] have demonstrated that no particular type of intervention is more effective.

3.7.6 Effect on biological outcome

3.7.6.1 Effect on HIV/STI prevalence

In a Tanzania study [27] the “interventions had no significant effect on the occurrence of STIs such as *syphilis*, *genital herpes* or *Chlamydia* among either boys or girls. Additionally, it did not show a significant result on the prevalence of *trichomoniasis* and *gonorrhoea* among girls. There was a significant negative effect found on the prevalence of gonorrhoea among girls. Impact on HIV prevalence, a biological outcome, is not usually assessed.

A Nigerian study [28] demonstrated significant knowledge gain and prevention practices (behaviour) in study group and none in control group. In summary, given the complexity of factors that contribute to risk behavior, prevention efforts that focus exclusively on knowledge are unlikely to be successful. However, there are effective school-based HIV prevention programs, which typically rely on principles of Social Cognitive (Learning) Theory. These principles include the use of experiential activities that allow for the modeling and practicing of skills, and the reinforcement of group norms against unprotected sex. A focus on reducing sexual risk behaviors and the use of trained motivated teachers enhance program effectiveness. However, adolescents live and learn in a variety of social contexts, and it is important to expand the scope of HIV prevention to include contextual interventions. For example, consistent adult monitoring can reduce opportunities for risky

behaviors, and religious involvement protects adolescents from premature sex and drug use behaviors. Although they are currently very limited, school-based or school-linked clinic services, such as condom distribution and STI diagnosis and treatment, can be another important strategy for prevention [3].

3.7.7 Effect of peer-based versus provider-based types of intervention on HIV knowledge and behaviour outcome

3.7.7.1 Effect of peer-based intervention HIV knowledge and behaviour outcome

Frank et al. [8] demonstrated increased knowledge and decreased misconception and sexual risk behaviour in adolescents receiving peer education compared to adolescents not receiving peer education. These differences are apparent both over time and cross-sectional, and thus concluded that peer education in rural areas can be effective in HIV/AIDS prevention. Knowledge and behaviour can be influenced positively by peer-based HIV education model.

Studies [6,26,29] have suggested that most peer-based, school-based interventions were successful at improving knowledge and to lesser extent attitude-related outcomes. However, sexual risk behaviours were more difficult to change. A ‘Sex and HIV Education Programs for Youth’ study [25] revealed that the intervention effect of peer education at the individual level was significant. The students who received peer education had a significantly higher attitude-which influences behaviour compared with those who were not targeted. In same vein, an evaluation study on school-based HIV prevention intervention among Yemeni adolescents [30] reported significant increase in HIV knowledge and attitude scores among students targeted by peer education, compared to the control. In conclusion, school-based peer education intervention has succeeded in improving levels of knowledge on modes of transmission and prevention, and in decreasing levels of stigma and discrimination in a culturally conservative setting.

Peer-based HIV education among school-based adolescents also demonstrated increase in knowledge, attitude and sexually related behaviour in an African, [31] and Western Cape [32] studies. In another study [10], a peer-based HIV related sex education study conducted among school-based adolescents aged 10-18

years in Kampala Uganda, demonstrated that this method is effective in reducing risky sexual behaviours. Thus there was delayed initiation of sexual intercourse—the proportion that has ever had sex falling significantly from 43 to 11% compared to control group which remained virtually unchanged. Similarly, there was marked reduction in number of sex partners among sexually experienced adolescents at intervention schools by post intervention, compared to what obtained among their counterparts in comparison schools. In another peer-based community-based study [10], significant increase in knowledge and condom use in intervention group was recorded. It was found that at follow-up, youth in the intervention community (who received peer- education) were significantly more likely than youth from the comparison community to know females' symptoms of STIs and to be current users of condoms. This was also true for in-school youth and for out-of-school youth who had contact with a peer educator. Similarly, changes in reported condom use at most recent sex, were considerable.

In another study, adolescents who believe their friends are not in favour of sexual intercourse for teenagers have been found to be more likely not to engage in sexual intercourse whereas those who perceive their peers as being in support of condom use are more likely to use a condom [28]. Peer education has therefore been described as a core pillar of HIV prevention efforts globally [33] and has been found to be effective at improving knowledge and promoting attitudinal and behavioural change [28].

3.7.7.2 Effect of health provider-based HIV education intervention on HIV knowledge and behaviour outcome

Health provider-based intervention has its own effectiveness because as experienced and skilled adults they are able to implement HIV education curriculum. Systematic reviews assessed the main components of successful programs in terms of curriculum in its content, method and implementation and have found that curriculum-based plus adult-led interventions is the most effective category [24,29].

A study [10] on provider-based intervention reported significant increase in condom use among males and females. In same study a Health provider-based HIV prevention education among Nigerian secondary school student

recorded effectiveness on knowledge, attitude and behaviour regarding HIV transmission and prevention. Awareness of HIV and AIDS and attitudes towards those living with HIV or AIDS were significantly improved among intervention youth, compared to control youth at post-intervention. Also delayed initiation of sexual intercourse was found among the students who reported never having had sexual intercourse. The Health provider-based interventions are common as they are typically more intensive, based on theory and delivered by experienced and skilled health providers Also interventions have a multiple session program, employing a curriculum which includes a variety of skills and knowledge building activities to make them effective [7].

3.8 HIV Education Curriculum among School-Based Adolescents in Nigeria

The Nigerian educational research and development council developed and deployed a training curriculum for HIV risk reduction education intervention among adolescents which is called Family life and HIV education in secondary schools [34]. This is an attempt to use secondary schools as a platform to deliver HIV education intervention and this is necessary given that the majority of the adolescents/youths are in schools and an obvious way to deliver HIV information to youths is through schools [29]. The HIV/sexuality education can either be delivered by an adult who is either the school teachers or an expert provider or by a peer which is a student or another adolescent trained in the education and method of delivery. However, in-school education ought to be integrated into the existing structure to uphold sustainability. This increases the expectation of education to be delivered by teachers and/or students. However, the question that arises is how many teachers are knowledgeable, have good attitude and are willing to deliver the much-needed HIV and sexuality education that can reduce HIV risks among adolescents in schools. To answer this question, Adogu and Nwafulume [35] reported in their study that knowledge of sexuality education among the teachers was poor, even though many of them displayed the right attitude giving their willingness to teach it and then recommended that teachers need in-service training to improve their knowledge and modify adverse cultural beliefs towards sexuality education, and that school curriculum should be updated to introduce and accommodate all aspects of the subject.

The Family Life and HIV/AIDS education (FLHE) curriculum had been developed for adolescents and young adults in schools to guide programs for HIV risk reduction intervention. However as identified by another study [29] that though many countries have adopted a national HIV prevention curriculum, evidence suggests that implementation of these curricula has been slow. This slow implementation is not different in Nigeria as an evaluation study [30] revealed that FLHE programme was introduced nationwide in Nigeria in 2003, its implementation across the states in the six geo-political zones in Nigeria is not appreciable. There were also large variations in the year of adoption of the programme, level of implementation, the proportion of implementing schools that are reporting to the coordinating government ministries/agencies, the level to which schools have been supplied with relevant curriculum, and promptness of distribution of materials across the zones. All these indices did not show significant level of interdependence. The study also showed that there were higher levels of FLHE activities in the South than the North and that several problems like financial constraints and poor technical support affect implementation of FLHE in Nigeria. Thus, the FLHE programme has had positive effects in the states and schools where the implementation has been effective.

Though recommendation for FLHE curriculum use has been made, studies on evaluation of its effectiveness are rare. The nationwide coverage rate of FLHE by schools is not available except for; Lagos State in which all of the more than 300 public secondary schools had implemented the curriculum by mid-2007 [36]; Enugu State also implemented the curriculum in 2009 where the curriculum was introduced to assess baseline study of Reproductive Health Issues among In-School Adolescents in Enugu State [37]; and in Edo State where 84 schools implemented it by 2008. Only the Philliber research on Lagos State's FLHE Curriculum Implementation [38] is accessible. It reported that the FLHE-curriculum-exposed students had increased knowledge of sexuality and HIV, support for abstinence, and gender role equality.

4. CONCLUSION AND RECOMMENDATIONS

The factors that contribute to HIV risk behavior among adolescents and youth are complex. Prevention efforts should go beyond a desire to transmit knowledge and include principles of

social cognitive (Learning) theory such as experiential activities that allow for the modeling and practicing of skills, and the reinforcement of group norms against unprotected sex. A focus on reducing sexual risk behaviors and the use of trained motivated teachers enhance program effectiveness. Nonetheless, having looked at the various HIV/AIDS Education methods by critically examining the evidence of their effectiveness in past applications going into historical and geographical perspectives, it appears that peer-based education method is very effective in bringing about favourable HIV risk behavior among adolescents and youth. How much of this HIV Education strategy is actually incorporated in the existing HIV education curriculum, FLHE, in Nigeria? The answer may not be known unless an audit of the FLHE in Nigeria is done.

There is need for a comprehensive re-examination of the FLHE programme in Nigerian secondary schools along the line of this review. The re-evaluation of such innovative educational concerns as the Family Life and HIV/AIDS education will provide a baseline for effective implementation of HIV education and risk reduction programmes among Nigerian adolescents and youth.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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