ORIGINAL RESEARCH PAPER

Changes in Sexual Risk Behavior Among Adolescents: Is the HIV Prevention Programme in Nigeria Yielding Results?

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Abstract

This study conducted an analysis of the 2007 and 2012 National HIV and AIDS Reproductive Health Survey data with the aim of identifying the changes in high risk sexual behaviour among adolescents aged 15-19 years. It focused on changes in the history of use of condom with boyfriends/girlfriends, engagement in transactional sex, sex with multiple partners and age of sexual debut. Bivariate analysis was conducted to ascertain differences in the number of adolescents who engaged in these high sexual risk behaviours over the five-year study period. Data was also analysed for association between risk behaviour and possible predisposing factors. Over the five year period, HIV prevalence in the population increased significantly (p=0.02) especially in female (p=0.008). The number of female adolescents who became sexually active decreased significantly (p=0.02), and use of condom at last sexual act with non-marital sexual partners significantly increased (p=0.01). There was an insignificant increase in the proportion of males and females who engaged in transactional sex and who had multiple sex partners over the study period. More females who engaged in transactional sex were HIV positive (p=0.01), and more males who were sexually active in the last 12 months were HIV positive (p=0.01). There may be a need to redress the current HIV prevention intervention strategies. Attention needs to be paid to the national programme for the prevention of mother to child transmission of HIV programme as well as HIV prevention needs of female adolescents. *(Afr J Reprod Health 2014; 18[3]: 109-117)*

Keywords: sexual, behaviour, risky, HIV, adolescents, Nigeria, transactional, partners, multiple

Résumé

Cette étude a effectué une analyse des données de l'Enquête Nationale de santé de la reproduction et le VIH/ SIDA pour 2007 et 2012 dans le but d'identifier les changements dans les comportements sexuels à haut risque chez les adolescents âgés de 15-19 ans. Il porte sur l'évolution de l'histoire de l'utilisation du préservatif avec leurs petits amis / petites amies, l'engagement dans des transactions sexuelles, des relations sexuelles avec des partenaires multiples et l'âge lors du premier rapport sexuel. L'analyse bidimensionnelle a été réalisée pour déterminer les différences dans le nombre d'adolescents qui se livraient à ces comportements sexuels à risque élevé au cours de la période d'étude de cinq ans. Les données ont également été analysées pour l'association entre les comportements à risque et les facteurs prédisposant possibles. Au cours de la période de cinq ans, la prévalence du VIH dans la population a augmenté de façon significative (p = 0,02), surtout chez les femmes (p = 0,008). Le nombre d'adolescentes qui deviennent sexuellement actives a diminué de façon significative (p = 0,02), et l'utilisation des préservatifs lors du dernier rapport sexuel avec des partenaires sexuels hors mariage a augmenté de façon significative (p = 0,01). Il y avait une augmentation significative de la proportion d'hommes et de femmes qui se livraient au commerce du sexe et qui ont eu plusieurs partenaires sexuels au cours de la période d'étude. Plus des femmes qui se livraient au commerce du sexe sont séropositives (p = 0,01), et plus des hommes qui étaient sexuellement actifs au cours des 12 derniers mois ont été positifs au VIH (p = 0,01). Il pourrait être nécessaire de corriger les stratégies actuelles d'intervention de prévention du VIH. Une attention particulière doit être accordée au programme de la prévention nationale de la transmission du VIH de la mère à l'enfant ainsi que les besoins de la prévention du VIH chez les adolescentes. *(Afr J Reprod Health 2014; 18[3]: 109-117)*

Mots-clés: sexuelle, comportement, risque, adolescents, Nigeria, transactionnel, partenaires, multiple

Introduction

Sub-Saharan Africa is the region that is worst hit by the HIV/AIDS epidemic, and Nigeria accounts for the second highest burden of HIV worldwide. In 2012, 70% of all new HIV infections occurred in the region[1]. Youth are the most affected population. The Nigerian population is young: 31.7% of the population is those aged 10 years to 24 years. Adolescents make up a fifth of the

Nigerian population[2]. In Nigeria, there has been a 94% increase in HIV prevalence among adolescents aged 15-19years between 2007 and 2012[3]: Less than 35% of youth aged 15-24 years had comprehensive knowledge of HIV/AIDS. Among the youth, adolescents aged 15-19yrs had the lowest comprehensive knowledge on HIV and AIDS. Anecdotal evidence suggests that persons below the age of 18 are engaged in sex work, are injecting drugs and young men are having sex with other men and are injecting drugs[4].

Reported gaps in HIV/AIDS programming for adolescents include absence of a focused plan, lack of data on men who have sex with men and people who inject drugs less than 18yrs, low level of meaningful involvement of young people at conception, planning and implementation phases of programmes, service providers' lack of awareness and/or poor training on youth-specific service delivery[5]. Though efforts have been made to address the needs of adolescents and young people in various plans including the HIV and AIDS National Strategic Plan[6] and the National Youth Policy[7], there are still gaps. The documents do not contain a plan of action or strategic directions for different stakeholders/institutions that could be engaged in the national response for adolescents and young people. Neither does it address the recognised drivers of the epidemic among adolescents and young people namely multiple and concurrent partnerships; intergenerational sex; sexual coercion, low risk perception and transactional sex[4,8].

Given that the sexual transmission accounts for about 80% of new infections, the goal of the National HIV Prevention Plan to reduce new HIV infections cannot be achieved without positive change in sexual behaviours of the population. Adoption of safer sexual behaviours by adolescents would be key to reducing new infections in Nigeria. The HIV prevention response for adolescents has been hinged on a combination prevention approach that was adopted by the national HIV prevention in 2007 and called Minimum Prevention Package Interventions[9-11]. It has aimed at addressing behavior change using a combination of interventions targeted at individual, community and structural factors that increase risk and vulnerability to HIV infection. Emphasis was on reinforcements of interventions while underscoring dosage and intensity. It was largely aimed at catalyzing and achieving behavior change and maintenance of changed behavior.

This paper examines the evidence of changes in high-risk behaviour of adolescents (15years-19 years) - use of condom with non-marital partner and boyfriends/girlfriends, engagement in transactional sex, sex with multiple partners and current sexual activity - between 2007 and 2012. It also tries to identify possible factors associated with changes in HIV prevalence among adolescents during the study period with a view to developing key recommendations for the design and scale-up of HIV prevention programmes that focused on adolescents.

Methodology

This study undertook a secondary analysis of data presented in the 2007[2] and 2012[3] National HIV and AIDS reproductive health survey. The 2007 and 2012 National HIV and AIDS and Reproductive Health Surveys were nationally representative surveys conducted to provide information on key HIV, AIDS and reproductive health knowledge and behaviour related issues. The surveys conducted HIV testing for study participants who consented to receiving an HIV test. The major objectives of survey were to obtain accurate HIV prevalence estimates and information on behavioural and other risk factors related to HIV infection at the national, zonal and to some extent the state levels, to provide information on the situation of reproductive and sexual health and its determinants in Nigeria, and to provide data for the assessment of the impact of on-going Family Planning and HIV/AIDS behaviour change interventions in Nigeria. The 2007 survey enrolled 11,521 individuals from 11,822 eligible households showing a response rate of 97.5%. The 2012 survey enrolled 31,245 (15,596 males and 15,639 females) individuals from 32,543 households showing a response rate of 88%. Recruitment was done in both urban and rural Nigeria. Linked anonymous testing with immediate provision of test results was adopted for both surveys. The HIV testing was done using finger prick blood samples. In the case of never-

married adolescents aged 15-17 years; parental consent was sought before each adolescent was asked for assent. Where there was no parent living in the household, consent was requested from the adult who was a guardian who made decisions on the child or adolescents' behalf.

The testing approach involved collection of five blood spots from a finger prick on the same filter paper card and stored as dried blood spots (DBS). A unique random identification number (bar code) was assigned to each DBS and labels containing the same code affixed to the filter paper card, the questionnaire, and a field tracking form at the time of the collection of the sample. ELISA testing of DBS was carried out at a central laboratory concurrently with the processing of the completed survey questionnaires. The results of the HIV testing were obtained from a national reference laboratory in Nigeria. Specifically, 10% of non-reactive, all reactive and all discordant specimens by rapid test kits used on the field were carried out. The unique random identification number assigned to each sample and respective questionnaire served as the means for merging the survey and testing files.

The secondary data analysis focused on data reported for adolescents 15years – 19years in the survey.

Information extracted from the 2007 and 2012 NARHS reports included data on HIV prevalence, proportion of adolescents who were sexually active, and proportion of adolescents who engaged or did not engage in high risk sexual behaviour. For this study, high risk sexual behavour was defined as non-use of condom with non-marital sex partner or with boy/girlfriend at last sexual act; engaging in transactional sex; and having multiple sexual partners.

Data was also retrieved on possible predisposing factors for high sexual risk behaviour (uptake of HIV counselling and testing services, comprehensive knowledge of HIV prevention and comprehensive knowledge of HIV transmission). The UNAIDS set of knowledge indicators was also used for this study. This indicator specifically measures if individuals can respond to prompted questions: that transmission can be reduced by staying with one faithful uninfected partner, can reduce HIV transmission by using condom all the time, a healthy looking person can be HIV positive, mosquito cannot transmit HIV, and sharing meal utensils cannot spread HIV.

Bivariate analysis was conducted to test the differences in the proportion of adolescents with sexual risk behaviours and possible predisposing factors in 2007 and in 2012. Sex differences in sexual risk behaviour were also analysed. Where comparative data on sexual risk behaviour and predisposing factors for HIV infection could not be obtained, differences in proportion of those who engaged and did not engage in the identified HIV risk and predisposing factors was analysed using only the 2012 data. Where applicable, Pearson's Chi-square or the likelihood ratio was used. Chi-square was used to test significance of associations between variables. The level of statistical significance was inferred at $p<0.05$. Analysis was conducted using STATA version 10.0.

Results

There has been a significant increase in HIV prevalence among 15-19 year old adolescents over the five-year study period (1.7% vs 2.2 %, p=0.02). Though HIV prevalence increased in both male and female adolescents over the period, a significant increase was only observed for female adolescents (1.3% vs 2.9%; p=0.008). See Table 1.

Ever had sex and age at first sex

The proportion of 15-19 year old females who had ever had sex was found to have decreased significantly between 2007 and 2012 (42.9% vs. 37.4%; p= 0.001). There was also a decrease in the proportion of males who had had sex but this decrease was not statistically significant (22.2% vs 19.7%, p=0.07). See Table 1.

Table 1: Percentage of 15-19year old male and female adolescents who engaged in high risk behaviours in 2007 and 2012

Variables		2007 % (N)	2012 % (N)	P value
1	**HIV PREVALENCE**			
	Total	1.7 (1980)	2.9 (3992)	**0.02**
	Male	2.1 (1065)	2.9 (1903)	0.18
	Female	1.3 (915)	2.9 (2089)	**0.008**
2	**15-19YEARS WHO HAVE EVER HAD SEX**			
	Male	22.2 (1280)	19.7 (2473)	0.07
	Female	42.9 (1190)	37.4 (2770)	**0.001**
3	**SEXUALLY ACTIVE IN LAST 12 MONTHS OF THE SURVEY**			
	Male	15.9 (1280)	16.1 (2473)	0.85
	Female	35.8 (1190)	32.0 (2770)	**0.02**
4	**HAD SEX WITH NON-MARITAL PARTNER IN LAST 12 MONTHS**			
	Male	14.4 (1280)	19.7 (2473)	**0.000**
	Female	12.0 (1190)	37.4 (2770)	**0.000**
5	**USE OF CONDOM WITH NON-MARITAL PARTNER AT LAST SEXUAL ACT**			
	Total	39.4 (327)	48.0 (559)	**0.01**
	Male	47.8 (284)	56.4 (282)	**0.04**
	Female	28.7 (426)	39.6 (277)	**0.003**
6	**SEX WITH BOYFRIEND OR GIRLFRIEND IN LAST 12 MONTHS**			
	Male	14.0 (1280)	12.4 (2473)	0.17
	Female	12.0 (1190)	11.0 (2770)	0.36
7	**USE OF CONDOM WITH BOYFRIEND OR GIRLFRIEND AT LAST SEXUAL ACT**			
	Total	39.4 (322)	45.0 (603)	0.11
8	**SEXUALLY ACTIVE ADOLESCENTS ENGAGING IN TRANSACTIONAL SEX**			
	Male	8.8 (284)	9.3 (484)	0.82
	Female	6.9 (510)	8.9 (1004)	0.18
9	**SEXUALLY ACTIVE ADOLESCENTS WITH MULTIPLE SEX PARTNERS**			
	Male	26.4 (284)	29.9 (395)	0.32
	Female	4.7 (510)	6.9 (851)	0.10

Table 2: Association between HIV status and possible sexual risk and predisposing factors in 15-19year old male and female adolescents in 2007 and 2012

ADOLESCENTS WHO NEVER HAD SEX AND ARE HIV POSITIVE			
Male	1.7% (821)	2.7% (147)	0.43
Female	0.7% (539)	2.2% (1270)	**0.02**
ADOLESCENTS, NUMBER OF SEX PARTNERS AND HIV POSITIVE STATUS			
Multiple non-marital	2.5% (79)	5.7% (113)	0.33
One non-marital sex partner	2.5 (200)	5.0% (467)	0.15
No non-marital sex partners	1.5% (1685)	2.8% (654)	**0.04**

There was a significant increase in HIV the proportion of female adolescents who never had sex but who had a HIV positive result during the study period (0.7% vs 2.2%, p=0.02). See Table 2.

Currently sexually active

Significantly fewer females than males reported current (in the last 12 months) sexual activity (35.8 % vs. 32.0%; p=0.02) over the last five years.

The proportion of those who are currently sexually active however, remains twice as high among females compared to males. This difference in the proportion of males and females who were sexually active was significantly different in 2007 (15.9% vs 35.8%; p<0.0001) and remained so in 2012 (16.1% vs 32.0%; p<0.0001). The proportion of males who reported current (in the last 12 months) sexual activity increased insignificantly over the five years period (p=0.85). There was no significant difference in the HIV status of adolescents who were sexually or not sexually active (4.0% vs 2.6%; p=0.39) in 2012. However, there was a significantly higher HIV prevalence

among males who were sexually active when compared with those who were not (4.4% vs 0.0%; p=0.01) in 2012. See Table 3.

Table 3: Risk for being HIV positive among adolescents' 15-19years old who engaged in high sexual risk behaviour in 2012

		Percentage of those HIV positive who engaged in behaviour (N)	Percentage of those HIV positive who did not engaged in behaviour (N)	P value
1	**TRANSACTIONAL SEX**			
	Female	9.7% (76)	3.3% (725)	0.01
	Male	5.3% (41)	3.6% (381)	0.71
2	**USED CONDOM WITH NON-MARITAL SEX PARTNER**			
	Total	4.0% (224)	6.4% (277)	0.22
3	**SEXUALLY ACTIVE IN THE LAST 12 MONTHS**			
	Total	4.0% (1016)	2.6% (214)	0.39
	Male	4.4% (340)	0.0% (83)	0.01
	Female	3.8% (676)	4.3% (130)	0.68
4	**KNOWLEDGE OF HIV PREVENTION (UNAIDS INDICATORS)**			
	Total	3.1% (2118)	2.7% (1874)	0.46
5	**KNOWLEDGE OF HIV TRANSMISSION (UNAIDS INDICATORS)**			
	Total	2.8% (1692)	2.9% (2300)	0.80

Sex with non-marital sex partner

Sex with non-marital sexual partner in the last 12 months increased significantly among both males (14.4% vs. 19.7%; p<0.0001) and females (12.0% vs. 37.4%; p<0.0001) between 2007 and 2012. There was also a significant increase in the use of condom with non-marital sex partners at the last sexual contact over the five years period (39.4% vs 48.0%, p=0.01). This increase in use of condom was greater with females (28.7% vs 39.6%, p=0.003) than with males (47.8% vs 56.4%, p=0.04). The use of condom with non-marital sex partners was however still significantly higher for males than for females. See Table 1. There was no significant difference in the HIV status of those who used or did not use condom with their non-marital sex partners (4.0% vs 6.4%; p=0.22) in 2012. See Table 3.

Sex with Boyfriend/girlfriend

Sex with boyfriends and girlfriends still remained very low with an insignificant decrease in the proportion of males and females who had sex with boyfriend or girlfriend in the last 12 months preceding the survey. There was also an insignificant increase in the proportion of adolescents who used condom during their last sexual act with boyfriend or girlfriend over the five years period (39.4% vs 45.0%; p=0.11). See Table 1.

Transactional sex

The proportion of sexually active male and female adolescents who engaged in transactional sex increased between 2007 and 2012 though insignificantly (p=0.82 and p=0.18 respectively). More adolescent males engaged in transactional sex though no significant difference was observed in the proportion of males and females who engaged in transactional sex in 2007 (8.8% vs 6.9%) and 2012 (9.3% vs 8.9%). See Table 1. The risk of being HIV positive was higher for females who engaged in transactional sex when compared to females who did not engage in transactional sex (p=0.01). See Table 3.

Multiple sex partnering

There was a slight but insignificant increase in the proportion of sexually active males and females who had more than one sex partner during the study period. Significantly more males than females had multiple sex partners in 2007 (p<0.0001) and 2012 (p<0.0001). However, in 2007 the proportion of males who had multiple sex partners was 5.6 times that of females. By 2012, the proportion of males who had multiple sex

partners had decreased to 4.3 times that of females. This represents a 23.2% increase in the proportion of females who had multiple sex partners compared to males during the study period. See Table 1.

There was no significant difference in the HIV status of adolescents who had one (2.5% vs 1.5%; p=0.28) or more (2.5% vs 1.5%; p=0.50) non-marital sex partners when compared with the HIV status of adolescents who had no non-marital sex partner in 2007. This same observation was made in 2012: no significant difference was observed in the HIV status of adolescents who had one (5.0% vs 2.8%; p=0.06) or more (5.7% vs 2.8%; p=0.15) non-marital sex partners when compared with the HIV status of adolescents who had no non-marital sex partner. However, there was a significant increase in the proportion of adolescents who had no non-marital sex partner and who were HIV positive over the study period (1.5% vs 2.8%; p=0.04). See Table 2.

Knowledge of HIV prevention and transmission

The knowledge of HIV prevention increased significantly over the study period (46.2% vs 52.0%; p=0.0001). In 2012 however, only 21.8% of adolescents could correctly identify the five methods of HIV transmission. There was no significant difference in the HIV status of those who had good knowledge of HIV prevention or good knowledge of HIV transmission compared with those who did not have. See Table 3.

Discussion

The study showed trends that are encouraging and some that give cause for concern. First, the decrease in number of female adolescents who became sexually active and the increase in use of condom at last sexual act with non-marital sexual partners are encouraging observations. However, the increase in the proportion of males and females who engaged in transactional sex and in having multiple sex partners during this review period is a disturbing trend.

Second, the significant increase in the HIV prevalence of adolescents over the last five years calls for serious attention. This increase in prevalence may be a reflection of the fact that children infected with HIV are now growing into adolescents and driving up the HIV prevalence. The increase being observed may also be due to biomedical transmission - sharing of infected sharp objects, blood transfusion, and poor injection safety practices, or increase in high sexual risk behavior of young adolescents. The possible association between the increase in HIV prevalence and biomedical and/or vertical transmission of HIV is supported by the significant increase in the proportion of adolescents who did not have a non-marital sex partner and who were HIV positive. It remains unknown the contribution of biomedical and behavioural transmission to the HIV epidemic among adolescents in Nigeria. This highlights the need for more HIV related research to be conducted amongst adolescents in Nigeria including modes of transmission study.

Third, the study highlights the increased vulnerability of female adolescents to HIV for reasons other than their sexual behaviours. The three-fold increase in HIV prevalence among female adolescents who reported not ever having sex is staggering. The survey reports may be an artifact of bias reporting of females about pre-marital engagement in sexual intercourse. It also may imply that female adolescents have increased risk to other biomedical modes of HIV transition such as blood transfusion, sharing of sharp objects amongst others. This observation is a reflection of the need to understand the country specific epidemic and programme in this direction. Currently, there is no national HIV prevention programme specifically focusing on adolescents. There is however the Family Life HIV/AIDS Education programme designed to improve the knowledge of in-school youths in Nigeria. Coverage of programmes targeting out of school adolescents is low[12]. The national programme that promotes prevention of mother to child transmission may also provide HIV prevention programmes for older adolescents in communities where they are considered to be of reproductive age. The above-mentioned programmes focus attention on enhancing safer and responsible sexual behaviour and practices. Yet, this data highlights the probability that female adolescents are at increased risk for HIV through other means than risky sexual behaviour.

Fourth, while the observed significant increase in use of condom with non-marital sex partners in the last five years may be seen as protective, the increase in the number of adolescents who engage in transactional sex may be an indirect indicator of the need for improved economic support for adolescents. A continuing increase in the proportion of adolescents who engage in transactional sex would also have impact on the long-term effort to control new HIV infection. This was corroborated in this study by the observations that among female adolescents who engage in transactional sex, a significantly higher proportion are HIV positive.

Adolescent girls who engage in transactional sex - often for economic reasons - usually have limited ability to negotiate safe sex[13,14]. Age-disparate and cross-generational (ten years age difference or more) sexual relationships therefore increase girls' vulnerability to HIV infection[13]. Demographic and Health Survey data from Swaziland, Uganda, Tanzania and Zimbabwe found a significant association between a young woman's HIV status and the number and age of her partners[15]. In Swaziland, for instance, a young woman with more than one significantly older partner is three times more likely to be HIV positive[15].

Transactional sex or exchange of materials and money are norms of sexual partnerships in many African communities, with women gauging the marriage potential of their male suitors by how much money they have to share[14]. This form of transactional sex (the informal form of sex work) carries with it greater risk as individuals are less able to insist on the use of condom during these relationships[14].

This finding reiterates the need to strengthen the structural interventions component of the national combination package for HIV prevention paying specific attention to the vulnerability factors affecting the female child and adolescents. Structural interventions are intended to create an enabling environment to support the adoption of positive, safe and protective behaviour among adolescents. This could be achieved through addressing stigma and discrimination relating to HIV or age discrimination, gender disparities, policies, cultural norms and practices that increase vulnerability, empowerment of young people and provision of skills. Findings from the study also emphasise the need to pay attention to female adolescents as they are comparatively less likely to use condom during sexual intercourse with non-marital partners. Young people also need to be engaged in the design, implementation and evaluation of their HIV response as this affects programme uptake[15].

Despite these challenges, improved access to HIV testing and counselling will help inform young people about their status, help them to get the care they need, and avoid further transmission of the virus. Increase in uptake of HCT results in population decrease in HIV infection[16]. Unfortunately, only 12.4% of adolescents in this study had ever been tested for HIV in 2012, though this proportion is significantly higher than the proportion tested in 2007. Any effective HIV prevention strategy should aim to address factors that limit access to HCT by adolescents.

Knowledge of ways HIV could be prevented and transmitted could also offer protection from HIV[17]. Knowledge would enable adolescents know how to protect themselves and have the means to do so. However, the protective effect of knowledge of HIV prevention and transmission is higher for youths and younger females that received the information before they become sexually active[18-20]. It would also be protective for adolescents when such an education programme enhances the personal salience of HIV[21]. For adolescents in this study, comprehensive knowledge about HIV was not a protective factor as there was no significant difference in the HIV status of those who had good or poor knowledge about HIV prevention and transmission. This may imply that the national HIV education programme is introduced too late into the educational curriculum of the students[18,19]. It may also imply that the teaching about HIV only focuses on awareness and not understanding, nor does it focus on the personal salience of HIV, or acquisition of sex negotiation skills[22,23]. However, the observation from this study shows that over the last five years, there has been significant improvement in knowledge about HIV and increase in use of condom. The non-association between knowledge and HIV status may once

again be a reflection of the high HIV prevalence in adolescents resulting from increased survival of children who acquire HIV through maternal infection now living into adolescence. Mother to child transmission of HIV accounted for about 10% of new infection in Nigeria in 2012: the 2012 rate of HIV transmission was 30%[24]. The country also contributes 32% to the world gap in achieving a global target of eradicating mother to child transmission of HIV[25]. Without investment in prevention of mother to child transmission of HIV, the country may likely set up a vicious circle of children born to HIV infected mothers also giving birth to HIV infected children as these children are growing up to youths who now become sexually active. Concerted efforts are needed by the country to address barriers that limit access to prevention of mother to child transmission of HIV programmes in Nigeria.

One limitation of this study is the robustness of the analysis: the data analysis was not able to show the effect size of the various variables assessed on the HIV risk. Data analysis was limited to the 2007 and 2012 NARHS data publicly accessible in the published reports. The findings however provide evidence to generate hypothesis for further research on HIV in adolescents in Nigeria.

In conclusion, this study highlights an increase in high-risk sexual behaviour among adolescents in Nigeria. Transactional sex is associated with increased risk for HIV infection in female adolescents while engagement in sexual intercourse in the last 12 months is associated with increased risk for HIV infection in male adolescents. The poor implementation of the national programme on prevention of mother to child transmission of HIV seems to be contributing to the high HIV prevalence among adolescents. Attention needs to be paid to the HIV prevention needs of adolescents as their risk for HIV infection may result from other risk factors beyond high-risk sexual behaviours.

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Contribution of Authors

MOF conceived the idea of the paper. HA led the process of manuscript development. MOF, HA, UD collected the papers needed for the writing of the manuscript, were all engaged in the preparation of the manuscript and gave final consent to its publication.

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