

Sexual Behaviours among Oil and Gas Workers in the Niger-Delta Region of Nigeria: Assessing the Impact of Comprehensive HIV/AIDS Prevention Programs

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ABSTRACT

Introduction: The major means of transmitting sexual-related diseases including HIV is through unprotected sexual activities. This study aimed to assess the impact of comprehensive HIV prevention interventions on the sexual behaviour of oil and gas workers in Bonny Island, a rural community of Rivers State, Nigeria.

Methods: This is a cross-sectional-quantitative study that employed a structured questionnaire among oil and gas workers aged 15 – 49 years in Bonny Island. The information collected from February to April 2012 (after a three-year HIV prevention and control intervention programs) includes the socio-demographics; age, gender, education, occupation, marital status and data related to sexual behaviours. Data were analysed using IBM-SPSS version 25.0.

Results: There were 419 respondents each in baseline and post-intervention surveys. The rate of unprotected sex among respondents at baseline was 82.1% as compared to 20.3% after the intervention, odds ratio-18.02 (95% CI-12.76-25.45; P<0.0001). Sixty-one (14.6%) exchanged sex for gifts in the baseline and 12.4% in the post-intervention. At the baseline, 5.0% used condoms in the last sexual intercourse as compared to 26.0% in the post-intervention; odds ratio - 6.66 (95% CI-4.08-10.88; P<0.0001). Factors associated with condoms use include sex, age, education, duration in the community, marital status, and living with spouses (p<0.01).

Conclusion: There was a significant positive impact of a comprehensive intervention programme on the sexual behaviour of oil and gas workers in the rural community of Rivers State, Nigeria. However, regular interventions in rural communities towards the prevention of the spread of STIs and HIV are needed in Nigeria.

Key words: HIV/AIDS, Intervention programme, Sexual behaviours, STIs

Introduction

The vulnerability to Human Immunodeficiency Virus (HIV) and sexually transmitted infections (STIs)

have been reportedly high among industrial workers, especially the migrants.¹⁻⁴ The widespread of HIV and STI has also been described as the most important determinant of the burden of HIV in Sub-Saharan Africa.^{5,6}

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Some factors associated with unsafe behavioural changes such as unsafe sexual activities, excessive drinking, migration, mobility, and separation from family.^{1,7}

The risk of heterosexual HIV transmission is greater among workers in rural communities due to their lack of access to HIV treatment and prevention or

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inadequate facilities, exposure to sex workers and work situations.¹In sub-Saharan Africa, particularly the rural communities, the definition of sexual activities is determined by cultural belief, social and economic context. Discussing sex with the opposite sex in the public is seen as taboo.⁸ Both sexes (men and women) are at equal risk of HIV infection with about 80% of the risk associated with transmission through heterosexual activities.^{8,9}

High risky sexual behaviour among industrial workers has been reported in some parts of the world. The factors associated with such risky behaviour include being immigrant, drunkenness, and mobility and self-care challenges.^{1,10}

The widespread transmission of HIV and STIs in Nigeria, especially among the adolescents in rural communities have been associated with risky sexual behaviour and attitudes, which is mostly due to economic necessities to trade sex for financial rewards.¹¹ Some are even compelled into sexual engagements by men who are involved in multiple sexual relationships.⁵ Without exaggeration, the Niger-Delta area of Nigeria has been noted for high sexual activities and is partly due to the increased population of emigrant staff of oil and gas industries.¹¹ Due to the migration of wealthy oil and gas workers to the Niger-Delta region without their families, they use their wealth to entice the poor villagers to engage in unsafe sexual activities with them.¹² Consistent use of condom has been considered the most appropriate behavioural indicators used to assess the success of HIV-preventive interventions, particularly among key populations such as female sex workers, and people who inject drugs.¹³ Several individuals and community-based behavioural, biomedical and systemic interventions are commonly employed in the prevention of HIV and support for people living with the infection.¹³⁻¹⁷ A study conducted in sub-Saharan Africa on interventions to prevent STI/HIV found an increased use of condom among intervention participants as compared to those without interventions.¹⁸ Another study conducted in South Africa found that interventions helped in delaying sexual activities and increased use of condoms among sexually active youths as compared to the groups without interventions.¹⁹ The objective of this study is to assess the impacts of intervention programmes on the sexual behaviour of the oil and gas workers in Bonny Island, Rivers State, Nigeria.

Methods

This was a survey conducted in Bonny Island which is an oil-rich rural community of Rivers State, Nigeria. Similar to other parts of the world, the presence of a liquefied natural gas producing company (NLNG) in the community has attracted Nigerians from different tribes as well as foreign professional to work and live in Bonny, either permanently or temporarily.

Because Bonny Island had a high rate of HIV in this community, a baseline survey was conducted in the year 2006 by the Society for Family Health (SFH) and the data obtained was used as a base data for three years (2008-2011) HIV/AIDS prevention intervention programme carried out in the community by African Health Projects (AHP).²⁰

Interventions carried out in Bonny for three years included HIV voluntary counselling and testing (VCT), awareness creation through radio and television programs such as 'Jann Kunne film' (radio and television drama in local language), 'AIDS and You', 'Ireti alaafia (a program to educate the community on HIV)', 'One thing at a time', a radio drama program called 'Gari muna fata', a television program called 'Odejinjin', and a radio and television drama program called 'Abule oloke merin'.^{21,22} Other interventions include condoms made available in clinics and pharmacies for free, townhall and workplace meetings, HIV awareness creation using posters and handbills, free-referrals for HIV positive people and follow-ups programs. The interventions lasted for three years after which another survey was conducted on the sexual behaviours of the oil and gas workers to compare the outcomes of the intervention with their sexual behaviours before the interventions.

The estimated 1500 population of oil and gas workers aged 15-49 in the community was used to determine the sample size by applying Slovin's formula is

$$n = \frac{N}{(1 + Ne^2)}$$

n represents sample size, N = population of oil and gas workers = 1500, and e = marginal error of 4% = 0.04.

This formula was used because the prevalence of HIV or sexual behaviour among oil and gas workers was unknown at the time of this study.

$$n = \frac{1500}{(1 + 1500 \times 0.04^2)}$$

The pre-intervention sample size was calculated as 441 but 419 (95.0%) participated in the pre-intervention study. The sample size for the post-intervention study was estimated in line with the proportion of the number of respondents in the study before the interventions.

Data was collected between February and April, 2012 through the use of a structured questionnaire and only workers aged 15 – 49 years were included because these are the active labour force. Trained researcher assistants were assigned to the oil and gas companies and questionnaires were distributed to only those who volunteered to take part in the study. The data collected include the level of unprotected sex, transactional sex, and the use of a condom. The completed questionnaires were collected and verified for proper filling. Data collected were analysed with IBM-SPSS version 25.0 for Windows. Descriptive statistics were performed and the results were tabulated. Chi-square test was used to find the significance between variables setting the significant level at 5%.

The ethical approval number NHREC/01/01/2007-28/07/2011 was obtained from the Federal Ethics committee. Respondents were also informed about the study and their consents to voluntarily participate in the study was obtained before questionnaires were administered to them. No information that can be used to identify any of the respondents was collected and all participants were assured of the confidentiality of their personal information.

Results

The study comprised 838 respondents with 419 (50.0%) from each survey with a response rate of 95% (419 of 444) of the expected total sample size. The surveys comprised 419 oil and gas workers in the pre-intervention and post-intervention studies, making a total of 838 respondents. Since the interval between both surveys was six years and no information that can be used to identify any of the oil and gas workers was collected, the study could not ascertain the number of baseline respondents that participated in the post-intervention survey.

The proportions of males and females were 52.7% and 47.3% in the baseline and 54.4% and 45.6% post intervention. The majority of respondents in baseline were between 25-34 years old (45.6%) whereas the majority of post intervention respondents were 35 years old or higher (43.7%). The highest proportions

of respondents from both surveys attained secondary education 48.7% and 55.8%. While the majority of baseline respondents (52.7%) have been away from their families for about 12 months before the survey, only 34.6% have been away in the pre-intervention study. More than half of the respondents both in the pre and post intervention (74.1%-baseline and 65.5%-intervention) lived in the community with their spouses while 55.1% and 60.4% for baseline and intervention respectively see their families more than once every month as shown in Table 1.

As shown in Table 2, 82.1% of the baseline participants have had unprotected sex three months before the survey and this was significantly higher than 20.3% in the post intervention survey; the odds of engaging in unprotected sex at the baseline was 18.02 (95% CI-12.76-25.45; $P < 0.0001$) times higher than the post intervention. The rate of unprotected sex was 29.79 (95% CI-17.11-51.87; $P < 0.0001$) times higher among females in baseline than the intervention. Also, male respondents at the baseline were 12.18 (95% CI-7.80-19.00; $P < 0.0001$) more likely to have unprotected sex than those in the intervention. The rate of unprotected sex increased with increase in age in both surveys but significantly higher at the baseline with 70.7% among respondents aged 15-24 and 88.4% among 35 years when compared to post intervention with 11.6% and 15.8% for the same age groups respectively ($p < 0.0001$). The rate of unprotected sex was also higher in baseline across marital status (single 68.5%, married 90.7%) than in the post-intervention (single-14.6%, married-27.8%). Married people without intervention were 25.40 (95% CI-14.87-43.38) times more likely to have unprotected sex than their counterparts with interventions. Singles were 12.67 (95% CI-7.50-21.41) times likely to have unprotected sex at the baseline than interventions.

As shown in Table 3, the rate of transactional sex was low in both surveys but there was a slight reduction post intervention (12.4%) as compared to 14.6% in the baseline ($p > 0.05$). This slight reduction in transactional sex was observed across gender, age, marital status, level of education, and the number of times respondents see their spouses. However, a significant reduction was observed among respondents who have stayed in the community for four or more years with an odds ratio of 3.20 (95% CI-1.35-7.59; $P = 0.008$). Also, married people who did not live with their spouses in the community were 3.32 (95% CI-1.42-7.71; $P =$

0.005) times more likely to engage in transactional sex than those who lived in the community with their spouses.

Table 4 shows the proportion of those who used condom in their last sexual intercourse, both at the baseline and post intervention. While only 5.0% used condoms during last sexual intercourse in the baseline survey, 26.0% used condom in the intervention. The odds of using condoms after the interventions was 6.66 (95% CI-4.08-10.88; $P < 0.0001$) higher than without the interventions. The Table also shows significantly higher rates of using condoms in the post-intervention across all socio demographic profiles as compared to the

baseline ($p < 0.05$). Male respondents with interventions were 6.97 (95% CI-3.56-13.67; $P < 0.0001$) more likely to use condoms than those without interventions. Also, respondents who attained post-secondary education and were exposed to the interventions were 33.09 (95% CI-7.88-139.01; $P < 0.0001$) more likely to use a condom during sex than their counterparts at the baseline. Those who have stayed in Bonny for 1-3 years and had the interventions were 9.09 (95%-CI-4.35-19,01; $P < 0.0001$) more likely to use a condom than those without interventions. The odds of using condom among singles with interventions was 14.37 (95% CI-7.09-29.14; $P < 0.0001$) as compared to singles at the baseline.

Table 1: Socio-demographic profiles of respondents

Respondents Profile	Baseline (n=419)	Post-Intervention (n=419)
Sex of respondent		
Male	221 (52.7)	228 (54.4)
Female	198 (47.3)	191 (45.6)
Age group		
15-24yrs	99 (23.6)	112 (26.7)
25-34yrs	191 (45.6)	124 (29.6)
35yrs-above	129 (30.8)	183 (43.7)
Marital status		
Single	203 (49.2)	164 (39.1)
Ever married	216 (50.8)	255 (60.9)
Highest level of education		
No formal education/Primary	88 (21.0)	29 (6.9)
Secondary	204 (48.7)	234 (55.8)
Post secondary	127 (30.3)	156 (37.3)
Length of stay in Bonny		
Less than a year	99 (23.6)	83 (19.8)
1-3 years	129 (30.8)	187 (44.6)
4yrs and above	191 (45.6)	149 (35.6)
Stayed away from home in the past 12 months		
Yes	221 (52.7)	145 (34.6)
No	198 (47.3)	274 (65.4)
Live with the spouse in the community (married)		
Yes	160 (74.1)	167 (65.5)
No	56 (25.9)	88 (34.5)
How often do you see your spouse (Married)		
Not more than once a month	97 (44.9)	101 (39.6)
More than once a month	119 (55.1)	154 (60.4)

Table 2: Respondent who have had unprotected sex in the last three months

Respondents Profile	Baseline (n=419)		Intervention (n=419)		Odds ratio (95% CI)	P-Value
	Yes (%)	Total	Yes (%)	Total		
Sex of respondent						
Male	170 (76.9)	221	49 (21.5)	228	12.18 (7.80-19.00)	<0.0001
Female	173 (87.4)	198	36 (18.8)	191	29.79 (17.11-51.87)	<0.0001
Age group						
15-24yrs	70 (70.7)	99	13 (11.6)	112	18.38 (8.92-37.85)	<0.0001
25-34yrs	156 (81.7)	191	16 (12.9)	124	30.09 (15.86-570.8)	<0.0001
35yrs-above	114 (88.4)	129	29 (15.8)	183	40.36 (20.68-78.8)	<0.0001
Marital status						
Single	139 (68.5)	203	24 (14.6)	164	12.67 (7.50-21.41)	<0.0001
Ever married	196 (90.7)	216	71 (27.8)	255	25.40 (14.87-43.38)	<0.0001
Highest education						
No education/primary	73 (83.0)	88	7 (24.1)	29	15.30 (5.54-42.24)	<0.0001
Secondary	181 (88.7)	204	33 (14.1)	234	47.93 (27.13-84.67)	<0.0001
Post-secondary	98 (77.2)	127	11 (7.1)	156	44.55 (21.26-93.35)	<0.0001
Length of stay in Bonny						
Less than a year	79 (79.8)	99	14 (16.9)	83	19.47 (9.14-41.11)	<0.0001
1-3 years	105 (81.4)	129	31 (16.6)	187	22.02 (12.23-39.62)	<0.0001
4yrs and above	159 (83.3)	191	18 (12.1)	149	36.16 (19.41-67.36)	<0.0001
Stayed away from home in the past 12 months						
Yes	185 (86.9)	221	36 (24.8)	145	20.01 (11.57-34.59)	<0.0001
No	167 (86.5)	198	48 (17.5)	274	30.24 (18.02-50.74)	<0.0001
Live with spouses in the community (married only)						
Yes	141 (88.1)	160	25 (15.0)	167	42.15 (22.2-80.00)	<0.0001
No	42 (75.0)	56	21 (23.9)	88	9.57 (4.49-20.85)	<0.0001
How often do you see your spouse (married)						
Not more than once a month	80 (82.5)	97	12 (11.9)	101	34.90 (15.71-77.54)	<0.0001
More than once a month	113 (95.0)	119	46 (29.9)	154	44.22 (18.15-107.75)	<0.0001
Total	344 (82.1)	419	85 (20.3)	419	18.02 (12.76-25.45)	<0.0001

Table 3: Distribution of respondents who exchange sex for gifts in the last three months

Respondents Profile	Baseline		Intervention		Odds ratio (95% CI)	P-value
	Yes (%)	Total	Yes (%)	Total		
Sex of respondent						
Male	27 (12.2)	221	27 (11.8)	228	1.04 (0.59-1.83)	0.903
Female	34 (17.1)	198	25 (13.1)	191	1.37 (0.79-2.41)	0.263
Age group						
15-24yrs	17 (17.2)	99	16 (14.3)	112	1.24 (0.59-2.62)	0.565
25-34yrs	23 (12.0)	191	14 (11.3)	124	1.08 (0.53-2.18)	0.840
35yrs-above	21 (16.3)	129	22 (12.0)	183	1.42 (0.75-2.71)	0.284
Marital status						
Single	31 (15.3)	203	21 (12.8)	164	1.23 (0.68-2.23)	0.501
Ever married	30 (13.9)	216	31 (12.2)	255	1.17 (0.68-2.00)	0.577
Highest education						
No education/primary	17 (19.3)	88	6 (20.7)	29	0.92 (0.32-2.60)	0.872
Secondary	31 (15.2)	204	33 (14.1)	234	1.09 (0.64-1.86)	0.747
Postsecondary	13 (10.2)	127	13 (8.3)	156	1.25 (0.56-2.81)	0.582

Length of stay in Bonny						
Less than a year	14 (14.1)	99	8 (9.6)	83	1.54 (0.61-3.88)	0.356
1-3 years	21 (16.3)	129	33 (17.6)	187	0.91 (0.50-1.65)	0.751
4yrs and above	26 (13.6)	191	7 (4.7)	149	3.20 (1.35-7.59)	0.008*
Stayed away from home in the past 12 months						
Yes	36 (16.9)	213	32 (22.1)	145	0.72 (0.42-1.22)	0.222
No	25 (13.0)	193	20 (7.3)	274	1.89 (1.02-3.51)	0.044*
Live with the spouse in the community (married respondents)						
Yes	12 (7.5)	160	14 (8.4)	167	0.89 (0.40-1.97)	0.768
No	18 (32.1)	56	11 (12.5)	88	3.32 (1.42-7.71)	0.005*
How often do you see your spouse? (married)						
Not more than once a month	19 (19.6)	97	16 (15.8)	101	1.29 (0.62-2.69)	0.490
More than once a month	11 (9.2)	119	9 (5.8)	154	1.64 (0.66-4.10)	0.289
Total	61 (14.6)	419	52 (12.4)	419	1.20 (0.81-1.79)	0.363

* Significant at $p < 0.05$.

Table 4: Use of condom in the last sexual intercourse

Characteristics	Baseline (n=419)		Intervention (n=419)		Odds ratio (95% CI)	P-value
	Yes (%)	Total	Yes (%)	Total		
Sex of respondents						
Male	11 (5.0)	221	61 (26.8)	228	6.97 (3.56-13.67)	<0.0001
Female	10 (5.1)	198	48 (25.1)	191	6.31 (3.09-12.90)	<0.0001
Highest education						
No formal/primary	2 (2.3)	88	10 (34.5)	29	22.63 (4.58-111.81)	<0.0001
Secondary	17 (8.3)	204	45 (19.2)	234	2.61 (1.45-4.74)	<0.0001
Post-secondary	2 (1.6)	127	54 (34.6)	156	33.09 (7.88-139.01)	<0.0001
Length of stay in Bonny						
Less than a year	2 (2.0)	99	10 (12.0)	83	6.64 (1.41-31.25)	0.0165
1-3 years	9 (4.7)	191	58 (31.0)	187	9.09 (4.35-19.01)	<0.0001
4yrs and above	10 (7.8)	129	41 (27.5)	149	4.52 (2.16-9.46)	<0.0001
Marital status						
Single	10 (4.9)	203	70 (42.7)	164	14.37 (7.09-29.14)	<0.0001
Ever married	11 (5.1)	216	39 (15.3)	255	3.36 (1.68-6.75)	<0.0001
Stayed away from home in the past 12 months						
Yes	15 (7.0)	213	47 (32.4)	145	6.63 (3.37-11.88)	<0.0001
No	6 (3.1)	193	62 (22.6)	274	9.11 (3.85-21.56)	<0.0001
Live with the spouse in the community (married)						
Yes	4 (2.5)	160	12 (7.2)	167	3.02 (0.95-9.57)	<0.0001
No	7 (12.5)	56	27 (30.7)	88	3.10 (1.24-7.72)	<0.0001
How often do you see your spouse (married)						
Not more than once a month	8 (8.2)	97	25 (24.8)	101	3.66 (1.56-8.59)	<0.0001
More than once a month	3 (2.5)	119	14 (9.1)	154	3.87 (1.08-13.78)	<0.0001
Total	21 (5.0)	419	109 (26.0)	419	6.66 (4.08-10.88)	<0.0001

Discussion

This study aimed to assess the impact of three years of community-based comprehensive HIV prevention intervention on the sexual behaviour of oil and gas workers in Bonny Island, a rural community of Rivers

State, Nigeria. This is vital to the control of HIV/AIDS and other STIs in Nigeria and other low-and-middle-income countries.

Unprotected sexual intercourse is among the commonest routes of HIV transmission in developing

countries like Nigeria, especially in rural communities.¹ Consistent use of condom is a widely known appropriate behavioural pointers used to assess the success of HIV-control interventions, particularly among the key populations.¹³

This study found a very high rate (82.1%) of unprotected sex in the community before the health interventions. This rate was drastically reduced below 25% after the interventions ($p < 0.001$). This reduction can largely be attributed to the interventions in this community. The rate of unprotected sex was found higher among females than in males without intervention. This might be as a result of more married women than men since our study also revealed that the level of unprotected sex, both in three months before the survey and in the last sexual activities was higher in females than in males. There was a significant decline in the rate of unprotected sex among both males and females in the post-intervention ($p < 0.001$) with females having a lower rate of unprotected sex. This can be attributed to the level of awareness education intensified through radio and television programs as well as town hall meetings, flier's distribution and free distribution of condoms. Studies have identified an association between non-use of condom with being female and living with spouses/partners in the last sexual intercourse.¹ However, our finding (for people without interventions) contrasts the finding of Udoh *et al.* in Nigeria who reported that more men had unprotected sexual intercourse than women.¹¹ Our study only found that more males than females had unprotected sex after the interventions.

Though our findings revealed an increase in the percentage of participants that used condom in their last sexual intercourse from 5% in baseline to 26.0% in post-intervention surveys, with those in the post-intervention were 6.66 (95% CI-4.08-10.88; $P < 0.0001$) times likely to use condoms more than their baseline counterparts. A meta-analysis study conducted in Nepal showed a similar improvement in the use of condom due to exposure to behavioural interventions in both vaginal and anal intercourse.¹³ However, the improvement is still low though our study could not establish whether the intercourse was with regular partners or sex workers. This low level of condom usage in the rural community emphasises the need for more and regular interventions. The low uptake of condom is not peculiar to Bonny Island because several other studies have reported low levels of condom usage,

particularly without intervention.^{18,19,24,25} In a similar study to characterize unsafe sexual behaviour among factory workers in Northern Vietnam, it was found that the use of condom among the workers in the last sexual intercourse was very low, regardless of whether the sexual intercourse was with casual partners or sex workers.¹ Another study conducted in Jordan among factory workers reported that just 2.1% used condoms with regular partners during the most recent sexual intercourse and 27.7% reportedly used condoms with non-regular sexual partners.²⁶

Other factors associated with unprotected sexual intercourse in this study include having stayed in the community for four years or more, not living with spouses in the community and not seeing spouse more than once in a month. These findings are in agreement with previous studies from different part of the world.^{1,10,26-28} Similar to the findings of this study, improved usage of a condom due to intervention had previously been reported in sub-Saharan Africa, India, and Vietnam.^{1,10,29,30}

This study found a significant decline in the percentage of respondents who exchange sex for gifts from 14.6% at baseline to 12.4% after the intervention ($P < 0.0001$). Those that exchanged sex for money or other gifts in both surveys were mostly females and singles, uneducated and those who were separated from their spouses for at least 12 months including those who did not see their spouses more than once in a month. The proportion of the respondents who exchanged sex for gift /money in our study is lower than the 27.5% baseline and 24.2% post-intervention seen in Ilorin, Nigeria.³¹ Some studies have also shown that single women (adolescents) are powerless to negotiate the desired outcome of sexual intercourse when money and gifts are exchanged.³² This inability to negotiate sexual intercourse when gifts are involved may be responsible for the high rate of exchange for money among young people. As seen in this study, lack of proper education and being unmarried are other factors that have been reported to influence the high rate of transactional sex in Nigeria.^{33,34} Studies have also revealed that women engage in sexual favours for a material benefit⁵ and this had been described as the result of poverty and financial and material reliance of women on men, which limit their negotiation for safer sex.³⁵ Similar to our findings, exchange for gifts money for sex has been found in rural areas⁴ because most of the wealthy workers of oil and gas industries migrate to

the Niger-Delta region without their families, they use their wealth to entice the poor villagers to engage in unsafe sexual activities with them.¹² This underscores the need for community-based sensitisation and enlightenment interventions towards the prevention of diseases and unwanted pregnancies.

The limitations to this study are, first, with the use of surveys and self-reporting information which may be biased. Second, due to the migration of workers, the proportion of the baseline respondents who participated in the post-intervention survey may be small since this study did not have any means to identify the baseline respondents, this may limit the detection of a difference in sexual behaviour of the oil and gas workers.

However, only oil and gas workers who participated in the intervention programs and presented for HIV counselling and testing were allowed in the study.

Conclusion

This study found a significant positive impact of a comprehensive intervention programme on the sexual behaviour of oil and gas workers in the rural community of Rivers State, Nigeria. There was an improved usage of a condom due to the intervention programs. Also, there was a drop in the level of exchange of gift for sex. However, there is a need for regular interventions in rural communities towards the prevention of the spread of STIs and HIV in Nigeria.

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