



Impact of Comprehensive HIV/AIDS Prevention Program on Reduction of Risky Sexual Behaviors in an African Rural Community

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Authors' contributions

This work was carried out in collaboration among all authors. Author AJO designed the study and wrote the protocol, Author FOS performed the statistical analysis, managed the literature searches and wrote the first draft of the manuscript. Authors POA, JS, SO and IA managed data collection and analyses of the study. All authors read and approved the final manuscript.

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ABSTRACT

Aims: This study compares the sexual behaviour of the residents of Bonny kingdom, Rivers State in pre-intervention and post-intervention periods of a comprehensive HIV/AIDS prevention program carried out by the African Health Project in collaboration with independent research consultants and members of the Ibanise HIV/AIDS initiative in the community for three years from 2009-2012.

Methodology: This is a quantitative survey that used a structured questionnaire among a representative sample of the general population aged 15 – 49 years. Post-intervention survey was

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conducted three years after the pre-intervention survey. The data obtained include the demographics; age, sex, education, occupation, marital status and sexual related information. Data were analyzed using SPSS version 25.0.

Results: This study comprised 1021 (53.3%) males and 895 females (46.7%) in the pre-intervention survey and 659 (54.2%) males and 556 (45.7%) in the post-intervention survey, mostly aged 15-34 years and had secondary education. More females have ever had sex in both surveys but there was a significant reduction in the percentage of males who have ever had sex from 70.8% to 42.0% in pre-intervention and post-intervention surveys respectively. The rate of sexual activities was very high before intervention among unmarried males (51.6%), age 15-24 years (69.6%), secondary education (50.7%) and graduates (65.9%). However, there was a drastic reduction in these values after the interventions. During pre-intervention survey, 9.4% of females and 13% of males had ever accepted or given gifts exchange for sex while the post-intervention survey showed a decrease into 8.0% among females and 5.5% among males. This proportion was 13.0% among adolescents 15-24 years in the pre-intervention survey and 4.7% in the post-intervention survey. Also, there was 65.0% decrease in the proportion of singles who had ever received gifts in exchange for sexual intercourse after the intervention. A high proportion of the males had multiple sexual partners during the pre-intervention survey (34.6%) but the value reduced to 3.2% after the intervention. Similarly, the percentage of the adolescent who had multiple sexual partners reduce from 22.2% to 2.5% due to the intervention. The pre-intervention survey showed that about 56.0% of males and 81.0% of females had sex with non-marital partners while the post-intervention survey showed that about 71.0% of males and 76.0% of females did same.

Conclusion: The study has shown a significant positive impact of health interventions in improving the sexual behaviour of Bonny residents. However, more and regular interventions are needed in this environment to further prevent the spread of HIV and STIs due to the vulnerability of the residents, especially the adolescents to sexually transmitted infection. There is also need for more study to evaluate the impact of sexual and reproductive health programs for adolescence and adult that already exist in Nigeria in comparison with the HIV intervention outcome.

Keywords: Sexual behavior; HIV; STI; prevention; rural areas.

1. INTRODUCTION

Sexual behavior among individuals is the way human beings express or engage in sexual practices. Humans engage in sexual activities on a day-to-day basis for various reasons even though sex is primarily made for reproduction. Studies have revealed that that people engage in sexual practices for four major and universal reasons. The first reason is for or due to "physical attraction," the second is that sex is seen "as a means to an end," while the third and fourth reasons are "to increase emotional connection," and to "alleviate insecurity [1,2]. The literature described risk sexual practices as having multiple sex partners, paying for sex, homogeneity sex, among others [3].

Due to the AIDS epidemic that has ravaged many countries in limited-resource countries, especially in Africa, sexual and reproductive health becomes very crucial. Currently, 1.9 million people are living with HIV/AIDS in Nigeria and HIV prevalence is highest in two South-South states and Rivers State with 5.5%, 5.3% and 5.3% in Akwa Ibom, Benue and Rivers

states respectively [4]. In the year 2019, there were 130,000 new HIV infections in Nigeria of which unprotected heterosexual sex accounts for 80% [4]. The remaining 20% were infection from in key affected populations such as sex workers [5]. According to the national strategic framework, there are specific cultural practices that contribute to high HIV vulnerability rate among the general population in Nigeria. These practices include female genital mutilation (FGM) [5], denial of women's access to inheritance [6], widowhood rites, encouragement of multiple sexual partners for males [7] and marriage of young girls to much older men [6]. WHO stated that Sub-Saharan Africa bears 40% of the global burden of sexually transmitted infection, with prevalence among young people aged 14 – 24 years [8]. Therefore, protective information is essential for rural dwellers to minimize their risk of HIV infection and other sexually transmitted infections (STIs) as well as to reduce unintended pregnancies, particularly among young people. Several studies have addressed sexual behavior among adolescent population using different terms such as early adolescent and young adolescent and adolescent but the information on

the sexual behavior of the entire rural population is rather scarce in Nigeria. The objective of this study is to assess the impact of comprehensive HIV/AIDS prevention program on reduction of risky sexual behaviors among the people of Bonny Kingdom, Rivers State, which is one of the states with highest HIV prevalence in Nigeria.

2. METHODOLOGY

This study was carried out on Bonny Island. The Island has been an important trading centre from the 16th century and this is reflected in the complex ethnic mix of its people. Bonny Island is located on the coast of Rivers State, occupying a distance of 2.72 sq. km. along the eastern coastal line of the Niger Delta area in southern Nigeria. It is a traditional Kingdom characterized by simple rural life with an estimated 30,000 indigenous Ibani people. In 2006, the Society for Family Health conducted the Ibani-Se HIV/AIDS baseline survey which was used as a strategic document in the formulation of a three years (2008-2011) intervention program. To respond to the growing spread of HIV and AIDS, the Ibani-Se HIV/AIDS Initiative was formed as a non-governmental public-private partnership by the Bonny Community, the Joint Industries Companies (NLNG, SPDC & ExxonMobil), Merck Sharpe & Dohme, and Nigerian Government agencies at Federal and State levels (the National Agency for the Control of AIDS and the Rivers State Action Committee on AIDS) to respond to the HIV/AIDS situation in the Bonny Kingdom. The Initiative in September/October 2006 conducted a Baseline Survey to determine the Knowledge, Attitudes, Practices and sexual behaviors of the target audience towards HIV prevention.

Critical to the design of any effective intervention program is putting in place a monitoring and evaluation system. This survey of HIV/AIDS-related information was essential to design effective HIV/AIDS interventions in the Bonny Kingdom, accurate baseline data was gotten from the various risk and occupational groups. The community-based interventions consist of reproductive education, HIV awareness training, free testing, empowerment programs for sex workers and the community people, provision of condoms, posters presentation, television and radio programs amongst others. The radio and television programs include 'Jann Kunne film', 'AIDS and You', 'Iretialaafia', 'One thing at a time', GariMuna fata', 'Odejinjin', and 'Abule

olokemerin' among others such as posters, health talks and several others. After 3 years of intervention, the effectiveness or impact of the various interventions was measured on key generated indicators on knowledge, attitudes and practices and beliefs using information derived from this post-intervention survey.

This quantitative survey involved the use of a structured questionnaire among a representative sample of the general population aged 15 – 49 years. Furthermore, data obtained from the household listing formed the basis for systematic and proportional sampling allocation and the sampling frame for the respondent's selection. Also, the availability of such vital statistics would be relevant for subsequent program planning and intervention. The following formula was used to determine the sample size for the target group (persons with multiple non-marital partners).

$$n = D \frac{[\sqrt{2P(1-P)}Z_{1-\alpha} + \sqrt{P_1(1-P_1) + P_2(1-P_2)}Z_{1-\beta}]^2}{\Delta^2} \quad [9]$$

Where: D = design effect; P_1 = the estimated proportion at the time of the first survey;

P_2 = the proportion at some future date such that the quantity ($P_2 - P_1$) is the size of the magnitude of change it is desired to be able to detect; $P = (P_1 + P_2) / 2$; $Z_{1-\alpha}$ = the z-score corresponding to the probability with which it is desired to be able to conclude that an observed change of size ($P_2 - P_1$) would not have occurred by chance; and $Z_{1-\beta}$ = the z-score corresponding to the degree of confidence with which it is desired to be certain of detecting a change of size ($P_2 - P_1$) if one occurred.

$$\alpha = 0.05 (Z_{1-\alpha} = 1.96)$$

$$\beta = 0.20 (Z_{1-\beta} = 0.84)$$

To determine the necessary sample size, and detect a change of at least 14 percent among people with multiple sexual partners and condom users within such relationships over a while when another survey will be conducted to assess program impact. We assumed $P_1=0.5$ which implies that $P_2=0.5 + 0.14$., the design effect is estimated at 1.5 for the cluster design to be used to sample the target groups. The level of precision is set at 0.05. Application of the above formula yields a sample size of 102 for each ward. Given a total of 12 wards in the entire Bonny Local government area, the total sample yield for the KAPB among the general population was $12 * 101=1212$ but 1215 were sampled. The

procedure allows all eligible respondents in the local government to have equal probability (equal chance) of being selected for the survey.

2.1 Data Collection Technique

Stage 1: All localities (town and villages) in the local government were arranged in their geographic order with their associated estimated population as their weights (measure of size, MOS). Using the localities estimated population the clusters to be used for the survey were allocated proportionately to localities.

Stage 2: After allocating the clusters to localities; the Enumeration Areas (EA- small compact units to which all geographic area of the country is carved by the National Population Commission) was obtained for the localities with one or more allocations of clusters during the stage 1 procedure. The EAs were also arranged in their geographic order and the numbers allocated to such localities were selected using systematic sampling procedure. This allow for spread of areas (cluster) to be used for the survey in the localities.

Stage 3: The Enumeration Areas selected in the localities were described and listed for field data collectors to locate and start listing to form clusters of eligible respondents to be interviewed. Field functionaries locate the Enumeration area site in the localities and start numbering and listing of members of households with their ages and sex. From the household listing eligible respondents are identified and numbered serially. The listing continues in these pre-selected Enumeration areas until three times the number of eligible respondents required in a cluster is obtained.

Stage 4: Systematically one in every three eligible persons listed to form a cluster is selected for final interview and questionnaire were administered to the selected groups.

Structured questionnaire was used for obtaining all information including data related to the sexual behaviour of the respondent including the existence of sexual transactions.

2.2 Data Analysis

Data obtained during the survey were entered with CS Pro and exported to SPSS version 25 for analysis. Socioeconomic characteristics, sexual behaviour, and transactional sex were analysed

using descriptive statistics. Chi-Square was used to compare categorical variables setting significant value at $p < 0.05$.

3. RESULTS AND DISCUSSION

3.1 RESULTS

3.1.1 Socio-demographic profile of respondents

This section attempts to compare the socio-demographic characteristics of the pre-intervention and post-intervention survey population. These background characteristics include age, sex, level of education, occupation, marital status and language understood.

Table 1 shows the demographic profile of the study participants before and after interventions. The percentage of responses are calculated based on the total response received from each question. The proportion of males and females are similar in both pre-intervention and post-intervention surveys (male: 53.3%/54.2%; Female: 46.7%/45.7%). The proportions of participants aged 15 – 24 and 35 years or higher were 42.3% and 24.0% in baseline assessment but the proportions in the post-intervention survey were 31.3% and 36.8% respectively. There was a significant improvement in the level of education in the post-intervention assessment as compared with the pre-intervention survey. The proportion of the population that had the highest of secondary education increased from 54.7% to 61.5% while graduate and postgraduate levels increased from 5.8% and 0.9% to 16.5% and 2.3% respectively. The converse result was obtained for no formals/primary education.

3.1.2 Respondents sexual behaviour

Table 2 shows that in both sexes, there was a decrease in the percentage of both males from 70.8%, to 42%, and females from 72.7% to 68.0%, that have ever had sex ($p < 0.001$). Also, there was a drastic decrease in the age group of first sexual intercourse ($p < 0.001$). There was a high proportion of sexual intercourse experience across all level of education and increased with increase in the level of education during the pre-intervention survey. There was a sharp reduction in sexual intercourse experience among the study participants after the intervention. Sexual experience also reduced significantly from 69.3% to 47.2% as a result of the 3 years intervention ($p < 0.001$).

Table 1. Demographic profile of respondents

Characteristics	Pre-intervention		Post-Intervention	
	n/Tn	%	n/Tn	%
Gender				
Male	1021/1916	53.3	659/1215	54.2
Female	895/1916	46.7	556/1215	45.7
Age group				
15-24 yrs	794/1877	42.3	380/1213	31.3
25-34 yrs	633/1877	33.7	387/1213	31.9
35 yrs and above	450/1877	24.0	446/1213	36.8
Highest level of education				
No formal education	126/1911	6.6	39/1209	3.2
Primary	591/1911	30.9	159/1209	13.2
Secondary	1045/1911	54.7	744/1209	61.5
Graduate	110/1911	5.8	200/1209	16.5
Postgraduate	17/1911	0.9	28/1209	2.3
Others	22/1911	1.2	39/1209	3.2
Occupation				
Public Servants	219/1911	11.5	592/1204	49.2
Farmer/Fishermen	193/1911	10.1	25/1204	2.1
Okada/Boat Riders	25/1911	1.3	331/1204	27.5
Self-employed	448/1911	23.4	119/1204	9.9
Unemployed	268/1911	14.0	32/1204	2.7
House wife	169/1911	8.8	38/1204	3.2
Students	431/1911	22.6	55/1204	4.6
Others	158/1911	8.3	12/1204	1.0
Marital status				
Single	933/1912	48.8	537/1215	44.2
Ever married	979/1912	51.2	638/1215	52.5
No Response	0	0.0	40/1215	3.3

3.1.3 Current sexual activity of the general population

It is observed that sexual activities are high within both sexes in though reduced after the intervention (male-79.4%; female-76.4%) compared to the values obtained before intervention (male-84.6%; female-84.8%), with all age group having the sexual activity of above 75% in both surveys. Also, unlike the pre-intervention survey were sexual activity among various educational levels range from 80% and above, the post-intervention survey showed that sexual activity among the various educational level was below 80% for those who attained secondary education and below but high among graduates (82.7%) and post-graduates (92.0%) as shown in Table 3.

3.1.4 Types of sexual partners

Respondents who reported having had sexual intercourse in the last 12 months preceding the survey were asked to state the number and type of partners they had. A distinction was made between marital and cohabiting partners, boy/girlfriends, casual and commercial partners. A marital/cohabiting partner was defined as a partner either married or living together as married with the respondent. All non-marital,

non-cohabiting sexual partners were considered non-marital partners. A boyfriend/girlfriend was defined as a non-spousal partner but more stable than a casual sex partner. A casual partner was defined as a partner one met on a casual basis and who may or may not have demanded payment, gift or favour for sex with little or no serious commitment from either side. A commercial partner was defined as one who demanded payment for sex on a strict cash basis.

Table 4 shows a high percentage of sex with boy/girlfriends before intervention among males (51.6%), age 15-24 years (69.6%) those that had secondary education (50.7%) and graduates (65.9%). There is a drastic reduction in these values after the interventions.

3.1.5 Sex in exchange for gift or favour(transactional sex)

Table 5 shows the distribution of the respondents who have ever had sex in exchange for gift or favour in both surveys. During pre-intervention survey, 9.4% of females and 13% of males reported that they had ever accepted or given gifts or some kind of favour in exchange for sex while the post-intervention survey showed a decrease in both values, where 8.0% of females

and 5.5% of males who reported accepting or given gifts or some kind of favour in exchange for sex ($p < 0.05$). The proportion of respondents who had received or given some kind of gifts or favour for sex though was higher (13.0%) among the age groups 15-24 years in the pre-intervention survey but this figure drastically reduced to 4.7% in the post-intervention survey and there was a general decrease across all age groups in the survey. Also, in pre-intervention single accounted for about 15.0% while the proportion reduced to 5.7% in post-intervention; which translates to about a 65.0% decrease. Among those with primary education pre and post-intervention were 17.0% and 2.4% respectively.

3.1.6 Multiple partnering

Information was collected from all respondents who had sex in the last 12 months preceding the survey on how many of a particular type of partner (both marital and non-marital partners) they had sex within the last 12 months preceding the survey.

From the data available on Table 6, a very few of the respondents had no sex partner, more of the female's respondents reported to have one sex partners (91.8%, pre-intervention and 41.0%, post-intervention) in as compared to males (63.8%, pre-intervention and 40.7% intervention). A high proportion of the males had two or more sexual partners during the pre-intervention survey (34.6%) but the value reduced to 3.2% after the intervention. Also, the proportion of respondent aged 15-24 years with at least two sex partners was 22.2% before the intervention but late reduced to 2.5% after the intervention. This reduction in the prevalence of multiple partners was observed in all age groups, education and marital status.

3.1.7 Sex with non-marital partners

Table 7 shows the proportion of respondents who have had multiple non-marital partners. The pre-intervention survey showed that about 56.0% of males and 81.0% of females had sex with one non-marital partner while the post-intervention survey showed that about 71.0% of males and

Table 2. Respondents who have ever had sex

Characteristics	Pre-intervention		Post-intervention		Chi-square value	P-value
	% ever had sex	Total response	% ever had sex	Total response		
Gender						
Male	70.8	1021	42.0	277	36.825	<0.0001
Female	72.7	895	68.0	328		
Age at first sexual intercourse					31.296	<0.0001
15-24 yrs	68.9	794	47.6	181		
25-34 yrs	78.0	633	51.9	201		
35 yrs>	70.4	450	51.1	228		
Highest education					80.265	<0.0001
No formal	69.6	125	48.7	19		
Primary	65.3	585	54.7	87		
Secondary	74.3	1029	50.5	376		
Graduate	79.1	110	49.0	98		
Postgraduate	77.4	62	50.0	14		
Others	0	0	43.6	17		
Occupation					824.813	<0.0001
Public Servants	79.0	219	51.7	592		
Farmer/Fishermen	72.5	193	60.0	25		
Okada/Boat Riders	72.0	25	51.1	331		
Self employed	75.0	448	45.4	119		
Unemployed	77.6	268	50.0	32		
House wife	78.7	169	31.6	38		
Students	55.7	431	49.1	55		
Others	76.6	158	75.0	12		
Marital status						
Ever married	99.8	924	89.6	481		
Single	69.3	933	47.2	301		
Widowed/Divorced	3.1	59	0.0	0		

Table 3. Respondents who had Sexual intercourse in the last 12 months by Socio-demographic

Characteristics	Pre-intervention		Post-intervention		Chi-square value	P-value
	% had sex	Total response	% had sex	Total response		
Gender						
Male	84.6	723	79.4	448	3.338	0.067
Female	84.8	650	76.4	349		
Age group						
15-24 yrs	79.5	547	76.0	238	34.883	<0.001**
25-34 yrs	88.6	493	79.5	264		
35 yrs>	86.8	317	78.4	294		
Education						
No formal	81.6	87	73.3	22	153.520	<0.001**
Primary	80.9	382	74.8	101		
Secondary	86.7	765	77.1	474		
Graduate	85.1	87	82.7	148		
Postgraduate	91.7	48	92.0	23		
Others	0	0	77.1	27		
Marital status						
Single	76.0	641	72.4	301	7.499	0.006*
Ever married	92.3	730	83.2	481		

* significant at $p < 0.05$; ** significant at $p < 0.001$

76.0% of females had sex with one non-marital partner. Also, during pre-intervention, respondents among the various age groups who had sex with one non-marital partner range between 50%-73% but the figure ranged between 70% - 75% in post-intervention showing about a 25.0% increase in sexual activity. Even within the various levels of education, in the post-intervention survey revealed that there was an increase in the number of respondents who had sex with a non-marital partner when compared to that of pre-intervention assessment.

3.2 Discussion

In Nigeria, the heterosexual route of HIV infection accounts for 80.0% percent of all transmissions [4]. Therefore, understanding of patterns of sexual behaviour and partner exchange is important to gauge the forces driving the spread of HIV and other sexually transmitted infections in communities. This study compares the sexual behaviour of the residents of Bonny kingdom, Rivers State before intervention with their sexual behaviour after the intervention through comprehensive HIV/AIDS prevention program carried out by the African Health Project in collaboration with independent research consultants and members of the Ibanise HIV/AIDS initiative in the community for three years.

3.2.1 Respondents sexual history

The study showed a positive impact of the interventions on the sexual activities of both

males and females comparing the results of the survey conducted before intervention with the result obtained after three years of enlightenment and empowerment programs. The number of those that have ever had sex was higher among females in both surveys than in males and there was a significant reduction in males who have ever had sexual intercourse as compared to females after the interventions. Before interventions, the proportion of the villagers who have ever had sex was high regardless of the education level and even higher among the highly educated people. There was also a smooth increase in the number of those who have ever had sexual intercourse as the age increases with the peak at 25-34 years. The sharp reduction in sexual intercourse found during post-survey shows the significant positive impact of the intervention which is similar to previously reported findings in Nigeria where 65.7% of males have ever had sex in a group without intervention but reduced to 62.5% in the group with an intervention [7]. The findings of this study are in agreement with the previous study where it was found that males and females were equally likely to have had sexual intercourse at least once and there is a gradual increase with age [7, 10-12].

This study also found that over 80% of both male and female participants have had sex in 12 months before the commencement of the interventions regardless of age (though slightly higher in females than in females). This values however reduced slightly below 80% after

Table 4. Types of sexual partners by socio-demographics among those who had sexual intercourse in the last 12 months preceding the survey

Characteristics	Pre-intervention					Post-intervention				
	Spouse/ cohabiting partners	Boy/girl friends	Commercial Partners	Casual partners	Total response	Spouse/ cohabiting partners	Boy/girl friends	Commercial Partners	Casual partners	Total response
Gender										
Male	56.0	51.6	5.6	12.7	762	32.4	25.7	8.8	13.3	456
Female	69.5	32.8	3.0	4.0	673	25.2	16.4	5.6	7.0	312
Age group										
15-24 yrs	32.7	69.6	4.6	9.5	483	17.8	14.2	4.1	6.8	244
25-34 yrs	68.7	37.9	3.6	7.5	549	21.1	13.1	5.0	6.8	263
35 yrs>	90.2	16.1	4.5	8.7	378	19.2	15.6	5.4	6.8	267
Education										
No formal	88.3	14.9	3.2	5.3	94	2.5	0.4	0.2	0.4	12
Primary	69.6	35.7	5.2	12.2	401	7.8	6.3	2.8	4.0	117
Secondary	54.9	50.7	4.7	7.8	793	33.5	28.6	7.9	10.8	464
Graduate	65.9	41.8	1.1	5.5	91	11.1	5.6	2.6	3.6	131
Postgraduate	37.5	56.3	6.3	0	16	1.7	0.7	0.2	0.6	15
Others	78.9	21.1	0.0	7.9	38	1.4	1.2	0.6	0.8	23
Marital status										
Single	7.0	91.7	5.1	11.7	554	12.2	29.8	4.7	8.2	309
Ever married	97.3	11.9	4.0	6.7	879	43.9	11.7	8.6	10.6	435

intervention but higher in males than in females (as against pre-intervention findings). The proportion of males and females engaged in sexual activities in this study was generally higher than the findings of a study conducted in four African countries which revealed that more males were engaged in sexual intercourse within the last 12 months than females; Uganda-male/female - 50.6/27.0%; Malawi-male/female – 38.7/23.6%; Ghana- male/female – 48.9/38.5% and Burkina Faso- male/female – 49.3/26.2% [11].

3.2.2 Types of sexual partners

Respondents who reported having had sexual intercourse in the last 12 months preceding the survey were asked to state the number and type of partners they had. A distinction was made between marital and cohabiting partners, boy/girlfriends, casual and commercial partners. A marital/cohabiting partner was defined as a partner either married or living together as married with the respondent. All non-marital, non-cohabiting sexual partners were considered non-marital partners. A boyfriend/girlfriend was defined as a non-spousal partner but more stable than a casual sex partner. A casual partner was defined as a partner one met on a casual basis and who may or may not have demanded payment, gift or favour for sex with little or no serious commitment from either side. A commercial partner was defined as one who demanded payment for sex on a strict cash

basis. We found that sexual activities were more predominant among the unmarried boyfriends and girlfriends. This finding is consistent with a study which reported that the rate of premarital sex was very common among adolescents though higher among boys than girls [2]. Also, approximately 7 of every 10 of these sexual intercourses involved adolescent aged 15 – 24 years and mostly among the respondents who attained secondary school and above. Though these values reduced drastically below 30.0% as a result of the interventions. A study of sexual behaviour in four African countries has also reported a high level of sexual activity among adolescents in all the four countries, both male and female. Among women/men aged 15–19, 29% /15% in Ghana, 37%/49% in Malawi, 45%/34% in Burkina Faso and 48% /49% in Uganda have had sexual intercourse [11].

3.2.3 Sex in exchange for gift or favour (transactional sex)

The impact of the interventions was very significant in Bonny village as there was a general decrease in the percentage of the males and females who have ever accepted gifts or some kind of favour in exchange for sex though this was more common in females than in males in both surveys. Adolescents aged 15 – 24 years also formed the highest group of those who accepted gifts in exchange for sex though the proportion reduced significantly by 60.1% as a

Table 5. Respondents who had transactional sex by socio-demographics of all those who have ever had sex

Characteristics	Pre-intervention		Post-intervention		Chi-Square value	P-value
	% had trans. sex	Total response	% had trans. sex	Total response		
Gender						
Male	12.7	723	5.5	570	4.016	0.045*
Female	9.4	650	8.0	463		
Age group						
15-24 yrs	13.3	547	4.7	315	12.289	0.002*
25-34 yrs	10.5	493	3.5	337		
35 yrs>	8.5	317	5.3	380		
Education						
No formal	3.4	87	0.5	29	35.048	<0.001*
Primary	17	382	2.4	136		*
Secondary	9.5	765	8.7	624		
Graduate	8	87	1.5	182		
Postgraduate	10.4	48	0.3	25		
Others	0	0	0.2	35		
Marital status						
Single	15	641	5.7	420	12.897	<0.001*
Ever married	7.8	730	7.2	586		*
No Response	0	0	0.7	27		

* significant at $p < 0.05$; ** significant at $p < 0.001$

Table 6. Respondents with multiple partners in the last 12 months by socio-demographics

Characteristics	Pre-intervention				Post-intervention				
	No sex partner	One partner	Two/more partners	Total response	No Sex Partner	One partner	Two/more partners	No Response	Total response
Gender									
Male	1.7	63.8	34.6	778	11.7	40.7	3.2	31.6	376
Female	3.0	91.8	5.2	673	14.2	41.0	1.7	36.1	302
Age group									
15-24 yrs	2.4	75.4	22.2	492	10.1	47.6	2.5	29.8	208
25-34 yrs	2.5	74.0	23.5	554	12.3	42.7	2.3	33.5	227
35 yrs>	1.8	81.6	16.5	381	15.3	41.7	2.3	31.4	212
Education									
No formal	1.1	88.3	10.6	94	9.1	22.7	2.7	54.5	22
Primary	3.4	75.9	20.7	411	7.2	39.2	3.1	38.1	97
Secondary	2	75.3	22.7	799	13.3	45.6	2.4	29.1	406
Graduate	1.1	78.0	20.9	91	12.4	45.1	2.1	31.9	113
Postgraduate	1.9	81.5	16.7	54	12.5	62.5	1.3	18.8	16
Others		0	0	0	36.4	27.3	0	36.4	22
Marital status									
Single	2.3	63.7	34	565	11.6	49.2	3.4	22.1	258
Ever married	2.1	85.3	12.6	884	14.2	41.0	1.7	36.1	402

Table 7. Respondents who had sex with one or more non-marital partners in the last 12 months preceding the survey by socio-demographics

Characteristics	Pre-intervention			Post-intervention		
	Had sex with one non-marital partner	Had sex with more than one non-marital partners	Total response	Had sex with one non-marital partner	Had sex with more than one non-marital partners	Total response
Gender						
Male	55.9	44.1	442	70.9	29.1	405
Female	81.0	19.0	226	75.6	24.4	303
Age group						
15-24 yrs	72.9	27.1	354	70.7	29.3	225
25-34 yrs	54.0	46.0	224	73.0	27.0	237
35 yrs>	56.8	43.2	81.0	74.8	25.2	246
Education						
No formal education	66.7	33.3	15	96.8	3.2	31
Primary	62	38	166	74.8	25.2	103

Characteristics	Pre-intervention			Post-intervention		
	Had sex with one non-marital partner	Had sex with more than one non-marital partners	Total response	Had sex with one non-marital partner	Had sex with more than one non-marital partners	Total response
Secondary	63.9	36.1	427	70.4	29.6	443
Graduate	76.2	23.8	42	77.5	22.5	102
Postgraduate	66.7	33.3	18	58.3	41.7	12
Others				64.7	35.3	17
Marital status						
Single	68.7	31.3	537	58.3	41.7	319
Ever married	46.9	53.1	130	85.7	14.3	364
No response	0	0	0	70.8	29.2	24

result of interventions. A similar decline was found among singles (regardless of age) who accepted gifts in exchange for sex with about 65.0% decrease. The reduction in transactional sex among respondents who attained secondary education was 85.9%. Recent studies have found that the exchange of gifts for sex is more predominant among adolescents than adults. For example, it was reported that boys offer good gifts to their girlfriends in the villages and enjoy sex with them [2]. Also, in a study conducted in South-west, Nigeria to assess the secondary school adolescents' perception of risk in sexual behaviour in a rural community of Oyo State, Nigeria, one of the reasons for premarital sex among adolescents and young adults is the exchange of gift for sex [13]. Another study conducted in Ilorin, Nigeria revealed that 27.5% of sexually active participants at pre-intervention had ever received gifts in exchange for sexual intercourse while the value reduced to 20.9% during the post-intervention survey [7]. This is also consistent with an earlier report in a rural community of Cameroun that 40% of girls of age 15-30 have ever exchanged sex for gifts or money [14] while young adults aged 21-26 constituted 41% [15]. An earlier study has suggested that the acceptance of gifts in exchange for sexual intercourse among adolescents (particularly females) is in response to deteriorating economic conditions of the nation, particularly in rural communities [7]. The consequence of this is a high risk of STIs and HIV infection among adolescents of Bonny Island if not checked.

3.2.4 Multiple sexual partners among respondents

Sex with multiple partners has been described as sexual contact with more than one partner at the same time and place [16]. Engagement with multiple sexual partners is an important aspect of sexual behaviour as it carries significant implication for sexual and reproductive health, including the transmission of HIV and other sexually transmitted infections. Information was collected from all respondents who had sex in the last 12 months preceding the survey on how many of a particular type of partner (both marital and non-marital partners) they had sex within the last 12 months preceding the survey. We found that though the majority of the population in both the pre-intervention and post-intervention had only one sexual partner, yet a high proportion (34.6%) of the male respondents had more than one sexual partner before the intervention. This

finding is similar to the value reported in a recent study conducted in Vietnam among male factory workers where 35.2% of participants who had sex in the last 12 months had multiple sex partners [12] but slightly lower than 45% reported to have more than one sexual partner in a study conducted in Ilorin, Nigeria [7]. However, the value is higher than what was found recently in a rural area of Bihar where about 5-10% of the males in villages had many sex partners [2]. There was about 91.0% reduction in this percentage as a result of the intervention. Also, the proportion of respondents aged 15-24 years who had two or more sexual partners reduced by 88.7% after the intervention. The high impact of intervention seen in this area is an indication of the right effort towards the prevention of the spread of HIV in Bonny community. Studies from other parts of Africa have noted that young women who are from poor families tend to involve in transactional sexual intercourse with more than one partner or even agree to have sex without a condom to satisfy their needs [10,17]. Similar to the studies which noted that migrant workers living apart from their wives were likely to engage in higher rates of multiple and commercial sex [3,18], the high proportion of multiple sexual partners found in Bonny kingdom might be due to the high influx of migrant workers in the community due to its high commercial and oil-rich nature. This, however, requires further studies. The Bonny Island without intervention would have resulted in a high rate of HIV and sexually transmitted disease in agreement with NACA that multiple sexual partners for males in some communities may increase vulnerability to HIV [6].

3.2.5 Sex with non-marital partners

The trend of the spread of HIV/AIDS and other infectious diseases show that sexual intercourse with non-marital partners is often considered to be a higher risk than sex with marital partners. Sex with multiple non-marital partners is even riskier. Though this study revealed that more males had multiple sexual partners than females, yet more females had sex with non-marital sexual partners than males. This practice among males and females put them at risk of contracting HIV if continued without intervention. Previous studies have reported that more village men had much sex with non-married partners and the reason is attributed to poverty among the females who need financial assistance from the affluent boys [2]. There was a slight reduction in the number of females who had sex with non-

marital partners before intervention by 12.3% in the post-intervention survey but sex with non-marital partners among males increased by 26.3%. This might be due to cultural practices such as the encouragement of multiple sexual partners for males [2,5,7]. Also, it might be as a result of taboo placed on the discussion of safe sex and sexual practice within relationships in this region [16]. Studies have associated vulnerability to STIs, HIV and maternal death with early sexual activities, particularly among [7,10,13,19-20]. This shows that there is a need for more enlightenment intervention in the rural community.

The very sharp decrease in respondent's sexual behaviour in men compared to women in this study can be attributed to the fact that women in rural communities have been associated with risky sexual behaviors mostly due economic needs that make some women exchange sex for financial rewards are earlier documented by Udoh et al.[20].

4. CONCLUSION

This study presents the findings from the questions posed to the respondents on their sexual behaviour. The survey, among others, elicited information about the age difference of the partner, types and number of sexual partners, and the practice of sex in exchange for money, favours or gifts. This study has shown a significant positive impact of health interventions in improving the sexual behaviour of Bonny residents. The resultant information can be used to determine how to further intervention strategies can be adopted to curb the further spread of the AIDS virus as well as other STIs and to minimise the impact of the HIV epidemic on the individual, community and society as a whole. Also, there is need for further study to determine the knowledge and the use of condom among Bonny people, especially the adolescents because they are more vulnerable to the risk of STIs/HIV due to their risky sexual attitudes.

CONSENT AND ETHICAL APPROVAL

Ethical approval was obtained from the National Health Research Ethics committee (NHREC), Federal Ministry of Health with approval number NHREC/01/01/2007-28/07/2011. Additionally, in line with the National Guidelines for mobile Voluntary Counselling and Testing (VCT), the

respondents' informed consent was sought and signed before the test was administered. Respondents also had the option of opting out or up taking the test after the counselling process and confidentiality was strictly maintained with the client not compelled to give out names as their VCT forms were assigned codes. Although the code was linked to the questionnaire number, however, this has no link to the person and confidentiality was ensured.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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