

## Research Article

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# Knowledge of Sexually Transmitted Infections among Female Sex Workers in an African Rural Community: The Impact of Community-based Interventions

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## Abstract

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**Background:** Sufficient knowledge of Sexually Transmitted Infections (STIs) is important in preventing and controlling HIV because it enhances the treatment of patients. This study compares the knowledge and experience of STI symptoms among Female Sex Workers (FSWs) in a rural community before three years of community-based intervention and after the interventions. The interventions include awareness creation through radio and television programs and drama, town hall meetings, free condom distribution, free STIs, and HIV testing, among others.

**Methods:** This was a cross-sectional study conducted among FSWs in pre-and post-intervention phases. A stratified random sampling method was employed to identify potential respondents at FSWs sites in Bonny Kingdom, Rivers State, Nigeria. A structured questionnaire was used to collect data from FSWs. One hundred and eighty-six (186) FSWs aged 15-49 were interviewed in the pre-and post-intervention studies using a previously validated and pre-tested structured questionnaire. Data were analysed using IBM-SPSS Inc. version-25.0.

**Results:** The level of awareness of STIs was high among FSWs at both the pre-intervention and post-intervention, yet a significantly higher proportion of post-intervention (97.3%) respondents have heard about STIs than the pre-intervention (86.6%) ( $p < 0.05$ ). The FSWs' knowledge of STI symptoms in women was significantly higher among post-intervention 156 (83.9%) than the pre-intervention 68 (36.6%), ( $p < 0.0001$ ). Similarly, FSWs' knowledge of STI symptoms found in men was significantly higher among post-intervention respondents 157 (84.4%), as compared to pre-intervention 61 (32.8%),  $p < 0.001$ . More than half (54.3%) of the pre-intervention respondents have experienced STI symptoms in the last 12 months as compared to 6 (3.2%) in the post-intervention study ( $p < 0.001$ ).

**Conclusion:** This study has shown significant contributions of community-based interventions to the knowledge of STIs, the related symptoms, and the treatment actions among FSWs, which is paramount to preventing and controlling HIV in rural communities with inadequate healthcare facilities. Regular and consistent interventions are therefore required to advocate in low-resource settings.

**Keywords:** STIs, HIV, Sex workers, Nigeria, Intervention

**Tweetable Abstract:** Community-based interventions significantly contribute to the knowledge of STIs, the related symptoms, and the treatment actions among FSWs.

## Introduction

It is estimated that over a million Sexually Transmitted Infections (STIs) are acquired worldwide daily [1,2]. In addition, STIs such as chlamydia, gonorrhoea, syphilis, and trichomoniasis account for one of every four of the total 376,000,000 new infections annually [1,2]. Therefore, STIs have been classified as among the top infectious diseases, and it is one of the ten leading diseases for which Nigerians seek medical attention [3]. The significant ways STIs spread are through vaginal, oral, and anal sex [4].

Sex workers have been among the key populations with a high prevalence of HIV since the beginning of the epidemic over three decades ago [5]; this is because sex workers are widely known for having sex with non-steady partners without condoms [6]. This

behaviour has led to the spread of STIs in many parts of Nigeria [7]. STIs have devastating effects on sexual and reproductive health worldwide, including pelvic inflammatory disease (PID) [1,3,4,7-9], anogenital injuries, human papillomavirus infection, and cervical cancer [1,3,8-10]. It is even responsible for about 305 thousand foetal and neonatal deaths every year [11].

The high prevalence of STIs and HIV prevalence in the Niger Delta region has been associated with multiple sexual partner relationships, inadequate public healthcare systems, and high illiteracy levels [12]. Studies have also associated the spread of STIs in the Niger Delta region with migration due to commerce and oil mineral extraction, attracting both the indigenes and foreigners [12,13].

There is documented evidence of HIV transmission among young and adult migrants who left their families behind to search for works in this region's oil and gas industries, particularly females who engage in sex work [13,14]. In addition, studies have explored the prevalence of STIs and HIV in this region [12–14], but information on the impact of community-based interventions on these infections is rather scanty. Therefore, the objective of this study was to assess the impact of a community-based intervention on the knowledge and the experience of STIs among FSWs in Bonny Kingdom of Rivers State, Nigeria.

## Methods

This survey was a cross-sectional study conducted in the pre-and post-intervention phases carried out in the Bonny Kingdom of Rivers State, Nigeria. The Kingdom is based on the southernmost edge of West Africa in Nigeria, near the town of Port Harcourt, making it a perfect location for trade ships and vessels from the international and inland waters. The Kingdom is among the most industrialised communities in Nigeria, hosting the country's largest coal and oil industries. As a result, there is a high influx of people (including sex workers) from Nigeria and abroad. The majority of the oil and gas workers lived away from their spouses; therefore, there is a very high rate of sexual activities and a high incidence of STIs, including HIV. A pre-intervention survey in 2006 by the Society for Family Health in Bonny kingdom was used as a base document in the initiation of a three years (2008–2011) HIV/AIDS prevention intervention program in this study. After the initial survey, three years of community-based interventions consisting of HIV awareness program, free HIV and STI testing, provision of condoms for sex workers, the use of posters and flyers, television and radio programs such as 'Jann Kunne film', 'AIDS and You', 'Iretialaafia', 'One thing at a time', 'GariMuna fata', 'Odejinjin' and 'Abule olokeimerin'[15] were carried out to curb the spread of STIs/HIV. The impact of these community-based interventions was assessed in 2012. No further community-based evaluation has been carried out in the Bonny Kingdom since then.

Stratified random sampling was used to identify potential respondents. Using stratified random sampling, twelve FSWs' sites were selected from all the 12 wards in the community, and interviews were conducted among 186 FSWs willing to participate. Some interviews were conducted at night to ensure confidentiality, and interviewees that were missed in the morning were intercepted at night.

The survey was a quantitative survey conducted among FSWs, using a previously validated structured questionnaire among a representative sample of FSWs aged 15 - 49 years. The sample size was determined based on the estimated population size of female sex workers in Rivers State, Nigeria. For point estimates, a 7% margin of error was deemed sufficient for the study since it involves baseline and post-intervention assessment. The 7% marginal error was used instead of 5% because of the anticipated unwillingness of FSWs to participate in the study before the interventions. Alpha  $\alpha$  was set at  $p = 0.05$  at 95% confidence interval. Population size was set at 1620 for FSWs in the Bonny Kingdom due to 5.4% prevalence of FSWs from 30,000 population [16]. The sample size was calculated as 350 FSWs (175 from each of baseline and post-intervention using Cochran sample size formula [17]) and the population size

of FSWs in the Bonny Kingdom (1620) at 95% confidence interval, response proportion of 50%, and marginal error of 7%. However, 186 (106.3%) responses were obtained in each of the baseline and post-intervention. Due to migration, possible change of job, death, and because the identities of the FSWs were concealed, this study could not ascertain whether the respondents at the post-intervention survey were the same as those who participated in the pre-intervention. Besides, the intervention was made available to all sex workers; regardless of their participation in the pre-intervention survey, no male sex worker was included.

Data were entered with CSPRO version 7.5.0 and analysed in IBM-SPSS Inc. version 25.0. The results were presented in Tables and charts. Chi-Square test of independence was used to determine the association between the independent (age, education, marital status, activity, length of stay in Bonny, length of time in sex work, and the number of clients) and dependent variables (the interventions), taking  $p$ -value  $< 0.05$  as significant.

Ethical approval was obtained from the National Health Research Ethics committee of Nigeria (NHREC) with approval number NHREC/01/01/2007-28/07/2011. The study procedure was explained to the participants, and written informed consent was obtained from them before administering the questionnaire. No data collected can be used to identify the respondents.

## Results

### Socio-demographic characteristics of the study participants

This study comprised 186 FSWs in each of the pre-intervention and post-intervention surveys. The majority of the respondents in both the pre-intervention and post-intervention studies had secondary education or higher 130/186 (69.9%) and 125/186 (67.2%), aged 25 years and above 95 (51.1%) and 131 (70.4%). The majority of the FSWs that participated in the baseline survey were part-time sex workers 97 (52.2%), have been in the Bonny Kingdom for less than one year 81 (43.5%), had 4 – 5 clients per day 66 (35.5%), working in sex work for at least one year 99 (53.2%), and never married 140 (75.3%). The majority of post-intervention respondents were full-time sex workers (68.8%), have been in the Bonny Kingdom for about 1 – 3 years (46.8%), had 2 – 3 clients per day 83 (44.6%), working in sex work for at least one year 103 (55.4%), and never married 151 (81.2%).

### Pre- and post-intervention knowledge of STIs among sex workers

Respondents were asked if they have heard about STIs, and the findings are presented in Table 1. The study found that the level of awareness of STIs was high among the pre-intervention and post-intervention respondents but significantly higher in the post-intervention (97.3%) than pre-intervention (86.6%);  $p = 0.009$ . The proportion of FSWs at the pre-intervention that knew about STIs was 82.6% for those without formal education, 81.8% for primary, and 88.5% for secondary or higher education. On the other hand, the level of awareness of STIs increased with education attainment at the post-intervention from 85.7% among uneducated FSWs to 100.0% among those who attained secondary or higher education. In addition, the levels of awareness of STIs were significantly higher after intervention among FSWs who attained

primary or higher education levels compared to the pre-intervention respondents ( $p < 0.05$ ). Similarly, higher knowledge of STIs was recorded after the intervention in all age groups, regardless of part-time or full-time FSWs, length of stay in the Bonny Kingdom, number of clients, length of time in sex work, and FSWs never married ( $p < 0.05$ ).

post-intervention 156 (83.9%) respondents than the pre-intervention 68 (36.6%), ( $p < 0.0001$ ). Only 38.7%, 29.0%, 21.5%, 26.9%, 14.5%, 15.1% and 33.3% of pre-intervention respondents were aware that abdominal pains, genital discharge, foul-smelling discharge, burning sensations, swelling groins, and itching of genital areas are symptoms of STIs in as compared to 75.3%, 81.2%, 87.6%,

**Table 1: Percentage distribution of respondents' knowledge of STI by socio-demographic characteristics**

Knowledge of STI's	Pre-intervention (n=186)			Post-intervention (n=186)			X2 (p-value)
	Aware of STI (a)	Total (b)	Awareness (%) (a/b)	Aware of STI (a)	Total (b)	Awareness (%) (a/b)	
<b>Level of education</b>							
No education	19	23	82.6	12	14	85.7	0.342 (0.559)
Primary	27	33	81.8	44	47	93.6	6.780 (0.009)
Secondary & higher	115	130	88.5	125	125	100.0	12.702 (0.004)
<b>Age group</b>							
15 to 24	77	91	84.6	52	55	94.5	5.528 (0.019)
≥25	84	95	88.4	129	131	98.5	7.642 (0.006)
<b>Full time/Part-time</b>							
Part-time	82	97	84.5	56	58	96.6	8.747 (0.003)
Full time	79	89	88.8	125	128	97.7	6.631 (0.010)
<b>Length of stay in the Bonny Kingdom</b>							
<1 year	69	81	85.2	71	73	97.3	8.747 (0.003)
1-3 yrs	68	76	89.5	85	87	97.7	6.631 (0.010)
≥4yrs	24	29	82.8	25	26	96.2	8.947 (0.003)
<b>Number of clients per day</b>							
0-1 client	45	52	86.5	57	58	98.3	8.677 (0.003)
2-3 clients	53	61	86.9	81	83	97.6	8.654 (0.003)
4-5 clients	57	66	86.4	30	31	96.8	7.740 (0.005)
≥6 clients	6	8	75.0	13	14	92.9	11.993 (0.001)
<b>Length of time in sex work</b>							
< 6 months	45	54	83.3	46	48	95.8	8.947 (0.003)
7-12 months	28	33	84.8	34	35	97.1	8.747 (0.003)
≥1 year	88	99	88.9	101	103	98.1	6.631 (0.010)
<b>Marital status</b>							
Ever married	40	46	87.0	30	32	93.8	2.835 (0.092)
Never married	121	140	86.4	151	154	98.1	9.734 (0.002)
<b>Total</b>	161	186	86.6	181	186	97.3	6.760 (0.009)

### Respondents' knowledge of STI symptoms found in women

The survey explored the respondents' knowledge of symptoms of STIs found in women. The respondents were tested for seven symptoms of STIs. The questions include, "Is abdominal pain (genital discharge, foul-smelling, etc.) a symptom of STIs in women"? A response of "Yes" was taken as "Aware" and "No" for "Unaware." The knowledge of STI symptoms was significantly higher among

81.2%, 93.5%, 81.2%, and 82.8% among post-intervention respondents as shown in Figure 1.

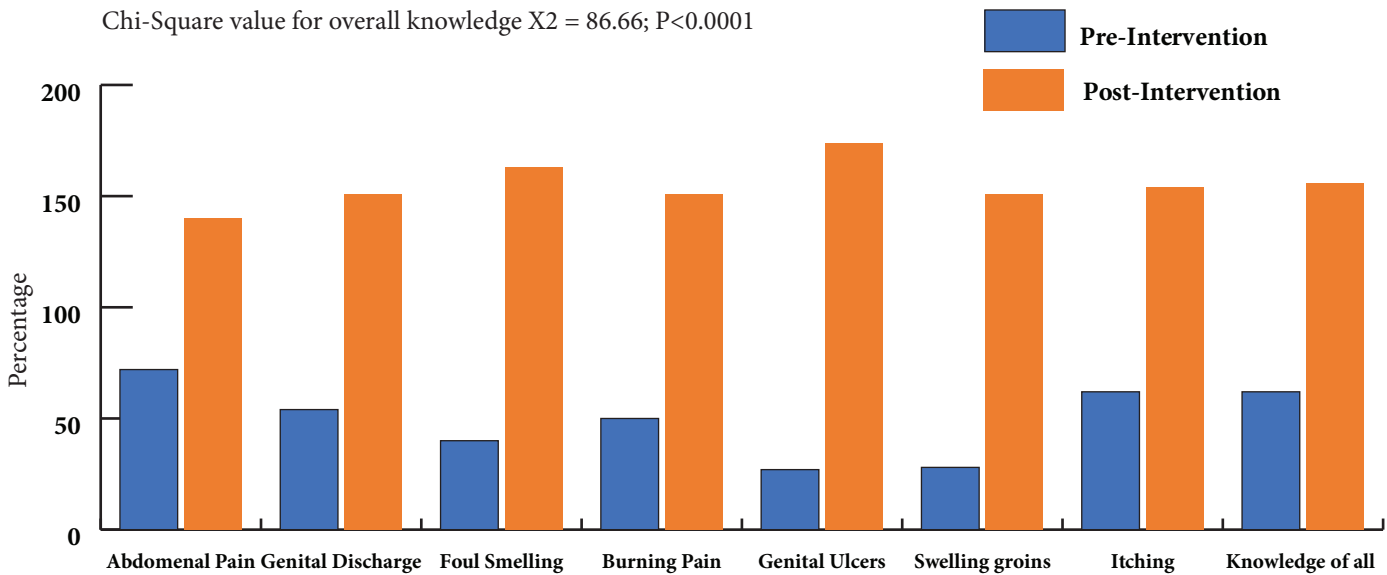


Figure 1: Knowledge of STI symptoms in women

### Respondents' knowledge of STI Symptoms found in Men

Respondents' knowledge was examined on four STI symptoms found in men. The questions asked include "Is genital discharge (genital ulcer, swelling in the groin, burning pains) a symptom of STIs found in men"? A response of "Yes" was taken as "Aware" and "No" for "Unaware." These symptoms include genital discharge

post-intervention versus pre-intervention (93.5% vs 31.2%), genital ulcers (87.6% vs 56.5%), swelling in the groin area (81.2% vs 21.5%), and burning pains (75.3% vs 32.8%). Overall knowledge of STI symptoms found in men was significantly higher among post-intervention respondents 157 (84.4%) than pre-intervention 61 (32.8%), as presented in Figure 2.

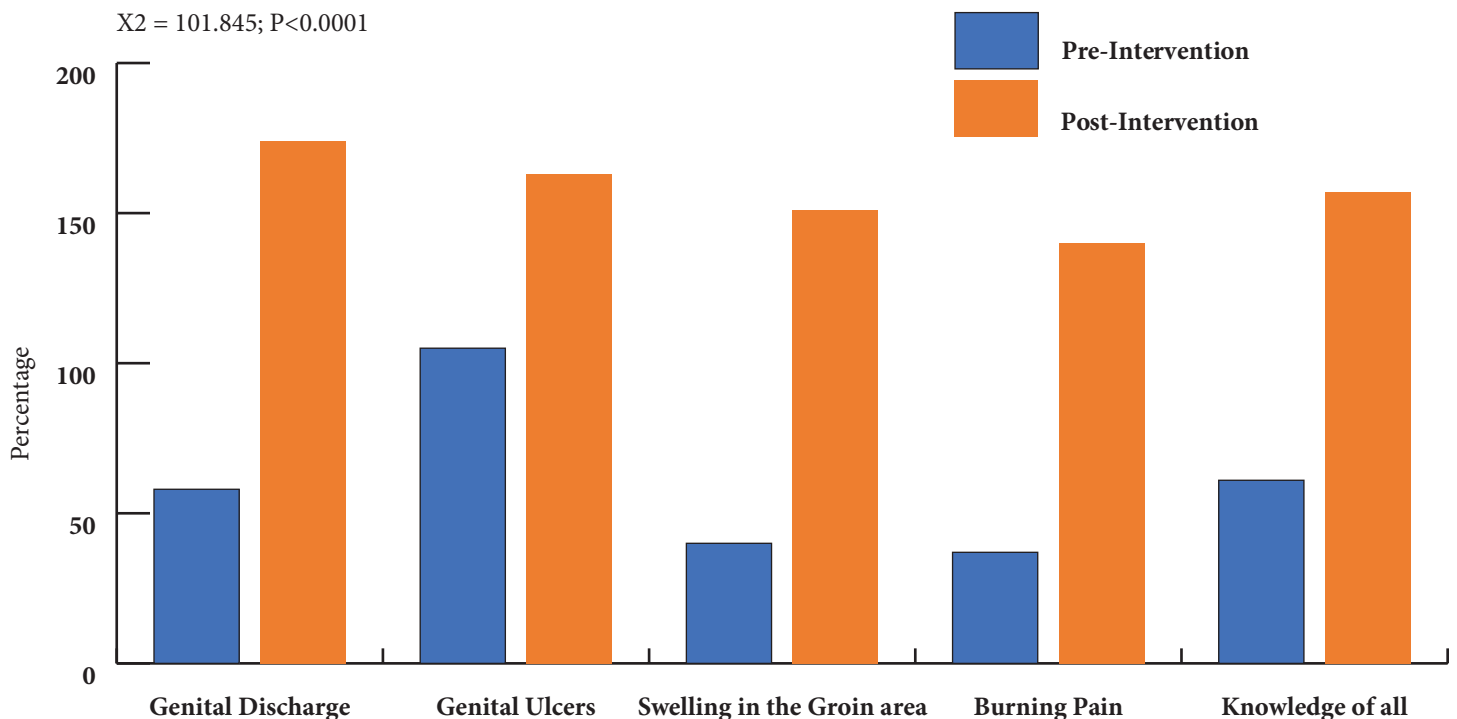
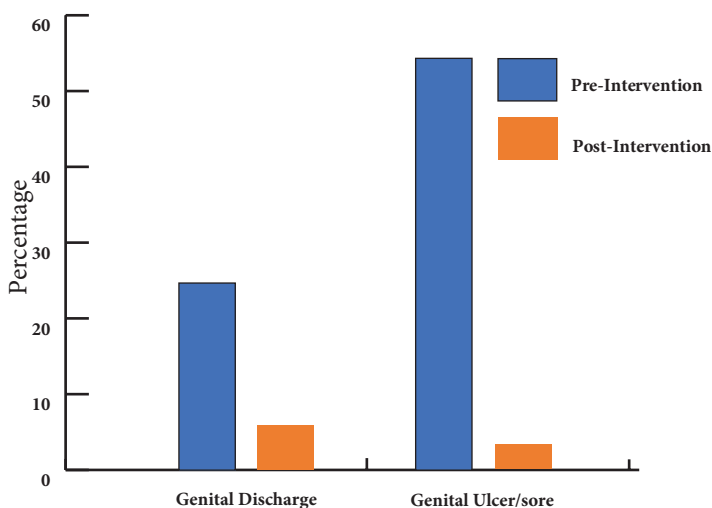


Figure 2: Knowledge of STI symptoms found in men

### Respondents' experience of STI symptoms in the last 12 months

Figure 3 shows the proportion of FSWs that have experienced symptoms related to STI, while Table 2 shows the treatment actions taken during such experiences. Overall, 147 (79.0%) had experienced STI-related symptoms in pre-intervention and 17 (9.1%) in post-intervention. More than half (54.3%) of the pre-intervention respondents experienced genital ulcer/sore in the last 12 months before the interview compared to 6 (3.2%) in the post-intervention. Similarly, a higher number of FSWs in the pre-intervention experienced genital discharge, 46 (24.7%), as compared to 11 (5.9%) among post-intervention respondents (Figure 3).



**Figure 3: FSWs who experienced STI symptoms in the last 12 months**

While only 15.6% sought medical advice after experiencing STI symptoms in the pre-intervention survey, 82.4% did the same after the interventions. The rate of use of local herbs and self-medication declined from 31.3% and 36.7% before the intervention to 11.8% and 5.9%, respectively, after the intervention. While 16.3% of pre-intervention respondents did not take any action after experiencing STI symptoms, no such action was recorded in the post-intervention survey ( $p < 0.001$ ), as shown in Table 2.

**Table 2: Treatment actions taken when experiencing STI symptoms**

Treatment actions taken	Pre-intervention (n=147)	Post-intervention (n=17)	X <sup>2</sup> (p-value)
Sought Medical Advice	23 (15.6)	14 (82.4)	39.140 (<0.001)
Used local herbs	46 (31.3)	2 (11.8)	
Self-medication	54 (36.7)	1 (5.9)	
Did nothing	24 (16.3)	0 (0.0)	

### Discussion

Sufficient knowledge of the symptoms of STIs is important in the prevention and control of STIs because it improves the knowledge

of patients seeking treatment [18]. Early diagnosis and treatment of STIs are important in the struggle against the spread of the infections. To assess the impact of a three years community-based intervention towards preventing the spread of HIV in the Bonny Kingdom, this study compares the knowledge and experience of STIs among female sex workers in the community before and after the community-based interventions.

Despite the high level of awareness of STIs among FSWs before the interventions, their understanding of the symptoms of STIs was inadequate. The lack of knowledge of the symptoms of STIs seen among pre-intervention respondents in this study is consistent with the previous studies that have reported insufficient knowledge of STIs among sex workers in Nigeria [3,9] and in Central Brazil [19]. The lack of awareness in the baseline might be due to discrimination against sex workers, both in the community and healthcare providers, and lack of knowledge of sexual and reproductive rights, as reported in previous studies [20–22]. However, the finding of this study contradicts knowledge of STIs reported in similar studies among FSWs in Madina[23], Turkey[24], Korea [25], and Nigeria[26], where more than half of the FSWs knew about STIs.

STIs deserve attention and interventions due to their higher prevalence, and if not detected and treated early, the consequences can be reproductive morbidity or even mortality [4]. The successful impact of the community-based intervention was reflected in the results of the post-intervention survey in this study. FSWs in the post-intervention study were not only aware of STIs, but they also knew the symptoms of the infections found in both men (genital discharge, burning pains, genital ulcers, and swelling in the groin area) and women (abdominal pains, genital discharge, foul-smelling discharge, burning pain, genital ulcers, swelling groins, and itching of genital areas). Several studies have reported positive impacts of interventions in promoting knowledge and prevention of STIs among vulnerable groups [1,7]. In addition to the intervention programs, the level of awareness was also found to increase education attainment. This finding aligns with previous studies that have reported a significant impact of education attainment sex-related interventions [27-28].

There was also a drastic reduction in the number of FSWs who experienced STI symptoms from 79.0% in the pre-intervention study to 9.1% in the post-intervention. The proportion of FSWs who experienced STI-related symptoms in the pre-intervention part of this study is similar to what was obtained in EI Salvador, where 82.0% of FSWs reported having experienced STI symptoms in the past 12 months [29] but higher than 49.0% seen in Brazil [19]. These studies were also conducted among FSWs without preventive interventions. The proportion of FSWs who experienced STIs at the pre-intervention survey of this study is higher than what was found in previous studies in Nigeria [3,9,26,30]. For example, two different studies in Lagos in 2013 and 2016 reported that 36.5% [3] and 25.0% [9] of FSWs had experienced symptoms of STIs in the last 12 months. Also, a study conducted in Ogun State, Nigeria, by Adeneye et al. in 2016 found that 23.0% of FSWs have experienced symptoms of STIs in the last 12 months [26]. Another study in Kano, State, Nigeria, found that 60.7% of FSWs have STI-related symptoms [30]. Since high proportions of FSWs in other studies have experienced STI symptoms similar to the pre-intervention findings of this study, the outcome of the post-int-



tervention analysis of this study shows a significant impact of the grassroots interventions, although other factors are not considered. Similar to the findings of this study, post-intervention, some previous studies had also reported a reduction in the prevalence of STIs among vulnerable groups when they were exposed to preventive interventions [8,9].

Before the interventions, most sex workers (68.0%) used local herbs or engaged in self-medications, and below 20.0% sought medical advice. However, after the interventions, the actions taken took a different dimension as more than 80% of the post-intervention participants sought medical advice. This finding corroborates with previous reports that despite the vulnerability of FSWs to health problems than other women, they are usually unable to access healthcare services from primary sources as other women due to stigmatisation and discrimination [31-32]. In addition, FSWs often face challenges in accessing sexual and reproductive health services from healthcare service providers due to discriminatory attitudes and insufficient information, resulting in seeking healthcare from peer groups or traditionalists who are untrained or unequipped for such [33-36]. However, with community-based interventions, a higher percentage of FSWs knew what to do when experiencing STI-related symptoms.

## Conclusion

This study found a significantly higher knowledge of STIs among post-intervention than the pre-intervention respondents. The FSWs' knowledge of STI symptoms in women and men was also significantly higher among post-intervention than the pre-intervention respondents. More than half of the pre-intervention respondents have experienced STI-related symptoms in the last 12 months compared to less than 10% after the interventions. In addition, more than 80% of the post-intervention respondents sought medical interventions when experiencing STI-related symptoms compared to less than 15% in the pre-intervention survey. This study has shown significant contributions of preventive interventions to the knowledge of STIs, the related symptoms, and the treatment actions taken among FSWs, which is paramount to preventing and controlling HIV in rural communities with inadequate healthcare facilities. Regular and consistent interventions are therefore advocated in low-resource settings.

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