

# HIV Prevalence and Associated Risk Factors among Female Bar Waitresses in Bobo-Dioulasso, Burkina Faso

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## Abstract

In Burkina Faso, despite the decline in HIV prevalence to below 1% in the general population since 2013, it remains high among key populations composed primarily of female sex workers (FSWs). FSWs are a heterogeneous group with various risks and practices. Within this composite group, less attention has been paid to female bar waitresses (FBWs). We conducted a cross-sectional study to investigate HIV prevalence and associated factors among FBWs in Bobo-Dioulasso.

After bar mapping and outreach on the benefits of HIV testing, FBWs from various drinking establishments were invited to visit the Yerelon clinic for free HIV testing and free medical care for sexually transmitted infections and other diseases from October 2012 to September 2014. Mobile HIV testing was also implemented to reach waitresses at their workplace.

Between October 2012 to September 2014, 513 FBWs were tested at least once for HIV. Their median age was 26 years with an interquartile range (IQR) of 21-30. The overall HIV prevalence among waitresses was 10.9% (95% CI: 8.45 – 14.07). HIV prevalence was higher in the fixed strategy at the Yerelon clinic 17.3% (95% CI: 13.0 – 22.2) as compared to the mobile strategy 3.4% (95% CI: 1.4 – 6.6). In the multivariate model, being older than 25 years (AOR = 5.1, 95% IC: 2.3 – 11.2) and being tested in the Yerelon clinic (AOR = 5.5, 95% IC: 2.5 – 12.1) remained strong predictors of HIV infection among FBWs.

In summary, HIV prevalence remains higher among FBW than in the general population and justifies their classification as high HIV risk groups. As the HIV epidemic becomes concentrated in key populations and a combination of HIV prevention is promoted, all categories of female sex workers as well as their clients must be considered for an appropriate response.

**Keywords:** HIV, Prevalence, Waitress, Female sex workers, Risk factor, Bobo-Dioulasso, Burkina Faso

## Introduction

In Burkina Faso, human immunodeficiency virus (HIV) prevalence has decreased less than 1% (0.6% in 2022) in the general population aged 15-49 years (the 15-49 age group

accounted for 44.3% of the population in 2022), it remains high in key populations composed mainly of female sex workers (FSWs) [1]. In 2013, HIV prevalence was estimated at 16.2 percent in FSWs [2,3], and this prevalence declined to 6.8 percent in 2022 [4]. The contribution of commercial sex to the

expansion and sustainability of the HIV epidemic is known in Africa [5,6]. According to the World Health Organization, FSWs are women aged above 18 years, who receive money or goods in exchange for sexual services, either regularly or occasionally, and who consciously define those activities as income generating even if they do not consider sex work as their occupation [7]. Based on this definition, FSWs are a heterogeneous group.

The Yerelon study group (cohort ANRS 1222) identified six categories of FSWs according to social characteristics with various risks and practices in Burkina Faso [8]. Categories include “roamers”, “seaters”, “bar waitresses”, “cabarets”, “sellers”, and “students” with an HIV prevalence varies between 14.5% to 56% among these categories [8]. Surprisingly, “Female Bar waitresses” (FBWs) who are classified as nonprofessional sex workers were more affected by HIV than “roamers” who are classified as professional sex workers with respectively 40% and 29% for HIV prevalence [8]. This vulnerability of FBW toward HIV was observed in 2006 by PAMAC (Programme d’Appui du Monde Associatif et Communautaire) which found an HIV prevalence of 11.2% among FBWs similar to that of the so-called FSWs (11.8 %) [9].

In Burkina Faso, who are the FBWs? In search of a better quality of life, young girls from less urbanized areas migrate to the country’s two major cities: Ouagadougou, the capital, and Bobo-Dioulasso, the economic capital [10,11]. These girls, mostly from rural areas have a low level of education, which does not allow them to obtain a well-paid job. In general, they are not sufficiently prepared to meet the challenges of cities where residents are facing a decline in employment [10,11]. Most of them end up serving in bars as waiters. Most of them are women 16 years of age and older who work in a bar area to sell or deliver drinks and food to customers. They earn little money per month, not enough to pay for their house and food, clothe themselves, and support the family staying in the village. They can hardly rely on this wage alone, which leads them to seek other sources of income, including transactional sex [8,12,13].

The high prevalence of HIV among waitresses was attributed to several sociocultural and economic factors. Factors such as socioeconomic vulnerability, poverty, economic dependence, engagement in transactional sex, sexual exploitation or survival sex, power imbalance, alcohol use, alcohol use by partners, limited access to health services, lack of health education, barriers to HIV testing and care, lack of social support, multiple sexual partners, low condom use, violence and coercion, sexually transmitted infections, lack of empowerment and autonomy, limited sexual autonomy are commonly found factors associated with HIV prevalence among female bar waitresses [8,14-19].

Moreover, some FBWs though mostly engaging in transactional sex, do not identify themselves as sex workers, differentiating sexual transactions from sex work and

distinguishing themselves from FSWs who go to bars to pick up clients, and whose main source of income is sex work [20]. As a result, they do not adhere to some interventions (e.g HIV and other sexually transmitted infections (STIs) screening campaigns) targeting FSWs and no specific intervention has been implemented to fight HIV in this environment.

Implementing interventions to increase access of women engaging in transactional sex to HIV prevention and care services is crucial as it would have a positive impact on the dynamics of HIV infection spreading [7,21].

Thus, an intervention has been developed to improve access to health services for FBWs in Bobo-Dioulasso. The intervention, named “Projet Serveuse”, was designed to provide free medical consultations to FBWs, including screening and treatment of HIV and sexually transmitted infections. We initiated this study to assess HIV prevalence and associated factors to alert policymakers, particularly those planning HIV prevention, to the need to strengthen actions toward FBWs.

## Materials and Methods

### Study design and Settings

We performed a cross-sectional study during a caregiving intervention to investigate HIV prevalence and associated factors among FBWs at Bobo-Dioulasso. Bobo-Dioulasso, the second-largest city in Burkina Faso is a commercial crossroads between Burkina Faso, Mali, and Ivory Coast.

In this city, the Yerelon research program has been established in 1998 (ANRS study 1222) and has developed and implemented an HIV and STI prevention and care package for high-risk women in Burkina Faso through the “ Initiative YERELON ” [8,22-25]. The “Yerelon clinic” is located within an open public service facility for medical consultation, environmental hygiene, control of food sellers, and vaccinations: the “Service d’hygiene”. This location provides security for attendance by reducing the stigma of those who attend the clinic. Clinical services provided in the Yerelon clinic include HIV and STI prevention, testing/diagnosis, treatment and care, and family planning services. The Yerelon clinic services are designed to be stigma-free, with health care providers and peer educators trained to work with populations that experience barriers to accessing health services [22-24].

The intervention named “Projet Serveuse” was implemented from October 2012 to September 2014 in Bobo-Dioulasso.

### Study population

Our study population consisted of all waitresses in bars and restaurants in the city of Bobo-Dioulasso. A city map of the different hot spots allowed us to identify the waitresses in these different places. In this study, we included those who had above 16 years old and agreed to be tested for HIV and to receive their results at the Yerelon clinic or their workplaces.

### Study intervention package

After bar mapping and outreach on the benefits of HIV testing, waitresses from different drinking establishments were approached by peer educators at their workplaces and were invited to visit the Yerelon Clinic the next day for free HIV testing and free medical care for STIs, and other diseases. The mobile HIV testing strategy was also implemented to reach waitresses who did not visit a clinic at their workplace. It consists of deporting a clinic team to the FBWs workplace to do an HIV test and giving the result on site.

The combined prevention package called the “Yerelon initiative” was offered to the waitresses who attended the Yerelon clinic. This service package included a combination of HIV and STI prevention activities through information and education for positive behavior change, counseling sessions (provided by peer educators), condom distribution, screening and syndromic management of STIs, HIV testing, clinical care including antiretroviral therapy (ART) and biological monitoring for HIV infected people [14,22-24,26].

### Data collection

A structured and standardized interview guide was used to collect data during the HIV testing. The interview was focused on socio-demographic characteristics (including age, educational level, marital status), knowledge, attitudes, and practices toward HIV and STIs, history of HIV previous testing, condom use during sex, knowledge of HIV transmission mode, and prevention methods.

### Measurement

The interview for HIV testing was conducted by a trained psychologist and sociologist. Socio-demographic characteristics were assessed with direct questions, some of whose answers were categorized, such as school level and marital status. The age was recorded after examination of the identity card. This variable was categorized into classes of five. For educational level assessment, the first question was: “Have you been to school?” If the answer was yes, a second question was requested from the last class attended. Educational level was then categorized as having no education, primary education ( $\leq 6$  years), and secondary education (7-13 years). Marital status was assessed in three categories with the question Are you living as a couple? If no, a second question determined whether the person was single or widowed. Condom utilization was determined based on women’s declarations during HIV testing to the question “Is a condom (male or female) used with permanent or regular partners or paying partners in the last month?”. The answer was categorized into three: all sex with a condom called “always”, some sex without a condom called “sometimes”, and no use of a condom called “never.” In this analysis, consistent condom use was defined as a response of “always” to the question. Responses of “sometimes” and “never” were defined as inconsistent condom usage.

During the interview, participants were asked to cite the main modes of HIV transmission. A second question asked what precautions should be taken to avoid infection. Knowledge of HIV transmission modes and prevention was dichotomized into “knowing” and “no knowledge.” If the person was able to name two of the three main modes of HIV transmission and at least two HIV prevention methods, they were classified as having good knowledge. In terms of self-perceived risk of infection, the question asked was: do you think you are at risk of HIV infection? The answer was no or yes.

At the end of the pre-testing interview, participants gave their informed consent for HIV testing.

### HIV testing

HIV testing was done according to Burkina Faso 2013 HIV screening algorithm. A venous blood sample was used to perform DETERMINE HIV-1/2 (Abbott Laboratories, Matsudo-Shi, Chiba, Japan) test for screening. If the DETERMINE test was negative, a negative HIV result was given to a patient. If the DETERMINE test was positive, we perform a second test Immunocomb® II HIV 1&2 BiSpot (Orgenics Ltd; Yavne, Israel) to confirm the first test and discriminated between HIV-1 and HIV-2. If the second test was positive the participant was declared HIV positive for HIV-1 or HIV-2 accordingly. If the second test was negative, the patient’s result was undetermined, and she was invited to repeat the test one month later.

### Statistical analysis

The data collected during the intervention were recorded on the double-entry under Access 2010. Age was collected as a continuous variable and was stratified into six categories (<20, 20–24, 25–29, 30-34, 35-40, 35–44, and  $\geq 40$  years). For descriptive analysis, frequencies and percentages were used for categorical variables, and for quantitative variables, the median with interquartile ranges was presented. Comparison between groups was done using *Chi-square* ( $\chi^2$ ) tests for proportions and *t-test* for continuous variables. Logistic regression was used in univariate and multivariate analysis to model HIV testing results (Positive/Negative). Explanatory variables included in the multivariate model were selected largely on an a priori basis but also on the statistical significance of variables with a *p*-value <0.20 in univariate analysis. A backward approach was used to remove the variables at the threshold of *p*-value <0.05. The data were analyzed using Epi Info7 software. A *p*-value threshold of 0.05 was considered statistically significant in the other tests.

### Ethics approval and consent to participate

The “Projet Serveuse” was an intervention to improve access to HIV testing and healthcare for FBWs in Bobo-Dioulasso. It was implemented by “Association Yerelon” (a non-governmental organization of vulnerable women) for management and social mobilization, and Yerelon clinic team for the HIV testing and medical care component. The project was not submitted

to the ethics committee before execution; however, the participants were volunteers, and each participant agreed to HIV testing and waited for their results.

## Results

### Characteristics of participants

A total of 513 participants were tested at least once for HIV from October 2012 to September 2014 and were therefore included in this analysis.

The median age was 26 years (with an interquartile range (IQR) 21.5 - 30 years). Based on the strategy used to reach the waitresses (fixed at the clinic or mobile on the work site), 54.2% of the participants got tested at the Yerelon clinic, and 45.8% were tested during the mobile strategy. The FBWs tested at the Yerelon clinic were significantly older (26.5 years,

IQR (22.5-32.5 years)) than those tested in the mobile strategy (25 years, IQR (21.5-29 years)) (p=0.0020) (**Table 1**). Regarding educational level, 48% have not attended any school and no difference was observed between participants according to testing strategy adherence. For marital status, 80.7% were single, 17.0% were cohabiting or married, and 2.3% were widows.

With regards to the history of HIV testing, 40.5% had never been tested for HIV and were younger (23 years IQR (20.5 – 30.5) than those has been previously tested (27 years, IQR (24 – 31.5) (p <0.0001). The analysis shows that 55.7% of FBWs knew about HIV transmission and prevention modes and 20% perceived themselves to be at risk of acquiring HIV. The condom use frequency was always 33.9%, sometimes 35.3%, and never 30.8%. **Table 1** summarizes participants sociodemographic characteristic, knowledge, attitudes, and practices toward HIV.

<b>Table 1.</b> Participants socio-demographic and behavioral characteristics, and HIV status.							
Variables	All participants (n=513)		Yerelon clinic (n=278)		Mobile strategy (n=235)		P value
	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)	
<b>Age (years)</b>							
Median (inter quartile range)	26.0 (21–30)		26.5 (22.5-32.5)		25.0 (21.5-29.0)		0.0020
<20	62	12.1	26	9.3	36	15.3	0.0256
20-24	155	30.2	77	27.7	78	33.2	
25-29	148	28.8	79	28.4	69	29.4	
30-34	69	13.4	44	15.8	25	10.6	
35-39	44	8.6	31	11.2	13	5.5	
≥ 40	35	6.8	21	7.6	14	5.9	
<b>Marital status</b>							
Single	414	80.7	223	80.2	191	81.3	0.3376
Cohabiting or married	87	16.9	46	16.6	41	17.4	
Widows	12	2.3	9	3.2	3	1.3	
<b>Educational level</b>							
None	245	47.8	134	48.2	111	47.2	0.2323
Primary education	170	33.1	98	35.3	72	30.6	
Secondary education	98	19.1	46	16.5	52	22.2	
<b>Condom use</b>							
Always	174	33.9	83	29.9	91	38.7	0.0984
Sometimes	181	35.3	106	38.1	75	31.9	
Never	158	30.8	89	32.1	69	29.4	
<b>Knowledge on HIV prevention and transmission mode</b>							
Knowing	286	55.8	161	57.9	125	53.2	0.2833
No knowledge	227	44.2	117	42.1	110	46.8	

Prior HIV testing							
Yes	305	59.4	173	62.2	132	56.2	0.1636
No	208	40.6	105	37.8	103	43.8	
Self perception of HIV risk (n=469)							
Yes	93	19.8	80	32.8	13	5.8	<0.0001
No	376	80.2	164	67.2	212	94.2	
HIV status							
Positive	56	10.9	48	17.3	8	3.4	<0.0001
Negative	457	89.0	230	82.7	227	96.6	

### HIV prevalence and associated factors

Among the 513 FBWs, HIV prevalence was 10.9% (95% CI: 8.4 – 14.1). This prevalence was 17.3% (95% CI: 13.0 – 22.2) in the fixed strategy at Yerelon clinic and 3.4% (95% CI: 1.5 – 6.6) in the mobile strategy ( $p < 0.0001$ ) (**Table 1**).

**Table 2** presents the results of the bivariate analysis. In univariate analysis, older than 25 years (odds ratio (OR) = 4.3, 95% CI: 2.0 - 9.1) (aged <25 years as the reference); condom use sometimes (always as the reference) (OR=2.6, 95% CI: 1.2 – 5.7), never (OR=2.5, 95% CI: 1.1 – 5.5) and perception to be at risk of HIV infection (OR=2.5, 95% CI: 1.3 – 5.1) were significantly associated with HIV infection acquisition. The FBWs tested in the Yerelon clinic had approximately 6 times

more likely to be tested positive for HIV than those tested in mobile strategy (OR=5.9, 95% IC: 2.8 – 12.9). Secondary school education level (OR= 0.2, 95% CI: 0.1 – 0,8), ever been tested for HIV (OR= 0.4, 95% CI 0.2 – 0.7), knowledge of HIV prevention and transmission modes (OR=0.5, 95% IC: 0.2 – 0.9) have protective effect against HIV infection.

In the final multivariate model, three factors were found to be independently associated with HIV infection: older than 25 years, ever been tested for HIV, and being tested at the Yerelon study clinic (**Table 2**). Older than 25 years adjusted OR (AOR = 5.1, 95% IC: 2.3 – 11.2) and to be tested in the Yerelon clinic (AOR= 5.5, 95% IC: 2.5 – 12.2) remained a strong predictor of HIV infection among FBWs.

**Table 2:** Factors associated with HIV infection among Bobo-Dioulasso female bar waitresses at univariate and multivariate logistic regression.

Variables	Univariate analysis		Multivariate analysis	
	OR* (CI 95%)	p value	AOR** (CI 95%)	p value
<b>Age (years)</b>				
< 25	1		1	
≥ 25	4.3 (2.0 – 9.1)	0.0001	5.1 (2.3 – 11.2)	< 0.0001
<b>Ever been tested for HIV</b>				
No	1		1	
Yes	0,43 (0.2 – 0.7)	0.0036	0,2 (0,1 – 0,5)	< 0.0001
<b>Condom use</b>				
Always	1			
Sometimes	2.6 (1.2 – 5.7)	0.0122		
Never	2.5 (1.1 – 5.5)	0.0216		
<b>HIV screening site</b>				
Mobile strategy	1		1	
Yerelon clinic	5.9 (2.8 – 12.9)	<0,0001	5.5 (2.5 – 12.2)	< 0.0001
<b>Marital status</b>				
Cohabiting or married	1			
Single	1.1 (0.5 – 2.2)	0.8607		

<b>Knowledge on HIV prevention and transmission mode</b>				
No knowledge	1			
Knowing	0.5 (0.2 – 0.9)	0.0205		
<b>Educational level</b>				
None	1			
Primary education	1.4 (0.8 – 2.6)	0.1987		
Secondary education	0.2 (0.1 – 0.8)	0.0272		
<b>Self perception of HIV risk</b>				
No	1			
Yes	2.5 (1.3 – 5.1)	0.036		
*Odd Ratio; ** Adjusted Odd Ratio				

## Discussion

Our results highlighted a high prevalence of HIV among FBWs in Bobo-Dioulasso and the main predictors of HIV infection in this population were older than 25 years and getting tested at the Yerelon study clinic.

Our findings show that FBWs were young women, with low educational attainment and single. The prevalence of HIV was close to that observed by PAMAC 5 years earlier (11.2%) [9]. In the same period, regardless of HIV seroprevalence decrease in the general population, (which was less than 1 % in 2013) [27], FBWs prevalence was 10 times higher. Globally in sub-Saharan Africa, HIV prevalence among FBWs is proportionately high with estimates varying by area, year, and the extent to which FBWs were distinguished from other high-risk groups such as FSWs [8,13,28,29].

In comparison, FBWs HIV prevalence was as high as that of FSWs in Burkina Faso in 2014 at 16.2% [27]. Our findings are consistent with those reported in other African urban areas with a HIV prevalence among FBWs close to that of FSWs [13,28]. While FBWs primary occupation is not sex work, and they typically do not identify themselves as FSWs and are at risk for HIV infection [20,26], many FBWs are engaged in commercial sex work and non-commercial transactional sex [8,20,30]. Some studies reported that FBWs share several characteristics with FSWs [8,31,32], and differences between FBWs and FSWs often arise less from the presence or non-presence of specific factors, but rather from their severity [32]. This similarity justifies the classification of FBWs in most countries as a group of sex workers. Compared with professional sex workers, the high vulnerability of waitresses is linked to their financial dependence on clients, their low capacity to use and negotiate condom use by the client [8,20], and the bar environment. Likewise, Messersmith *et al.* [20] in Ghana, studying the HIV vulnerability of bar workers and bar patrons noticed that many factors such as individual, relational, structural, and socioeconomic affect the HIV vulnerability of bar workers. Dambach *et al.* [13]

conceptualize these risk factors into three broad categories: macro-structural factors acting at the societal level (including the legal, political, cultural, and economic situation of the country or region under study), socio-structural factors that form FBWs' immediate context (including their poverty level, educational status, healthcare access, and workplace environment) and finally personal factors specific to each FBW (including interpersonal factors such as the nature of their relationship with sexual partners, exposure to gender-based violence, sexual behaviors, substance use, healthcare-seeking, psychosocial factors including depression and experience of stigma) [32].

Relatively to the workplace environment, the bar is characterized by the presence and consumption of alcohol which is also a source of vulnerability. Alcohol consumption causes disinhibition and decreases the perception of risk, which increases the likelihood of HIV risk behaviors such as unprotected sex, sex with multiple partners, transactional sex, and sexual coercion [33,34]. Also, alcohol consumption would increase an individual's risk of acquiring HIV or other infections by decreasing the ability of immune system cells to produce certain cytokines and thus a poor immune response in the event of exposure [35].

Despite several studies stating that virtually all FBWs performed transactional sex, their denial to consider themselves as FSWs alters their willingness to seek HIV prevention as confirmed by the relatively low rate of those already getting tested for HIV (59.4%) as compared to FSWs in Burkina Faso (85.6%) [36].

Concerning condom use, the relatively low proportion of FBWs who know HIV prevention and transmission mode could explain the inconsistent use of a condom [31,37]. Moreover, the fact that FBWs do not perceive themselves to be at risk of acquiring HIV and the variation in condom use that depends on the type of sexual partner could also explain this low condom use [31,37,38].

Regarding the HIV testing strategy, waitresses tested in the Yerelon clinic have a 6 times higher prevalence than those tested in the mobile strategy. Somé *et al.* [39] in the analysis of all HIV testing attendance data from 2006 to 2010 in Burkina Faso, noticed that HIV prevalence in fixed strategy was 5 times higher than in mobile strategy. This could be explained by the fact that with awareness campaigns, people who realize they took riskier behavior are more likely to seek care. Moreover, reaction to a possible positive result (crying, anxiety, distress) could dissuade those unsure of themselves from carrying out the test in the workplace. An adverse reaction could alert or inform friends and colleagues of the bad news of a positive HIV serology. In this environment, being infected with HIV is often stigmatizing. The fact that other care was available at the clinic in addition to HIV testing could also explain the preference for testing at the clinic.

Likewise, studies that estimated and compared the economic costs of different strategies noticed that fixed or hospital-based were the most cost-effective in terms of identifying HIV-infected persons as compared to mobile ones [39,40]. Our findings suggest the need for a comprehensive strategy combining the two strategies based on an “adapted service” that vulnerable populations could attend at any time [22,23]. These “adapted services” should be a specialized center for the diagnosis and management of STIs, HIV testing, and antiretroviral care, as well as primary health care and reproductive health services [7,41].

Our study has some limitations. Only 45.6% of waitresses registered in the different sites got tested for HIV during the intervention. This could have led to an underestimation of the HIV prevalence in this group because those who know their HIV-positive serology do not seek testing anymore. Moreover, HIV-infected FBWs already followed in the Yerelon clinic were not considered in this analysis. The knowledge assessment (HIV prevention, transmission mode, prior HIV testing, and male condom use) could have some social desirability biases that might have overestimated the outcomes. Despite these limitations, our results which describe the waitress’s situation regarding HIV at Bobo-Dioulasso are generalizable to the population of waitresses in Burkina Faso.

## Conclusion

The results of this study showed that despite an overall decline in HIV prevalence in Burkina Faso, bar waitresses remain highly exposed to HIV with a prevalence of 10 times higher (10.9%). They also had poor HIV knowledge, and a high proportion of inconsistent condom use and a relatively fair HIV testing rate. Addressing these risk factors through comprehensive, multi-faceted interventions such as targeted health education, increasing access to testing and treatment, promoting safer work environments, and reducing stigma could significantly reduce HIV transmission in this population.

At the time of HIV epidemic concentration in key populations

and promotion of combined HIV prevention, all categories of sex workers as well as their clients should be considered for an appropriate response to avoid a possible outbreak of the HIV epidemic in Burkina Faso. Despite FSWs and FBWs may share some similarities such as social backgrounds and life histories, it is important to consider FBWs risk profiles separately from those of FSWs. We advocate for the strengthening of communication for behavior change targeting these women and their sexual partners to awaken their awareness of the issue of HIV and to promote STI/HIV prevention interventions. Qualitative studies are needed to understand the social, psychosocial, economic, and behavioral vulnerability to HIV of FBWs, and the barriers to accessing health care, to inform the development and implementation of HIV prevention programs.

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## Author Contributions Statement

WWB, AS, ITT, and IK conceived the study; WWB, AS, and AM collected data; WWB drafted the manuscript; AS, ITT, AM, ST, ATO, IZ, and IK participated in critical revision of the manuscript drafts. All authors approved the final version of the manuscript.

## Declaration of Interest Statement

The authors declare no competing interest.

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