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Rico Januar Sitorus

Universitas Sriwijaya, Palembang, rico_januar@fkm.unsri.ac.id

Anita Rahmiwati

Universitas Sriwijaya, Palembang, anita_rahmiwati@fkm.unsri.ac.id

Diana Dewi Sartika

Universitas Sriwijaya, Palembang, dianadewisartika@fisip.unsri.ac.id

Elvi Sunarsih

Universitas Sriwijaya, Palembang, elvisunarsih@fkm.unsri.ac.id

Asri Maharani

University of Manchester, Manchester, asri.maharani@manchester.ac.uk

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Challenges and Policies for Female Sex Workers' Readiness to Participate in Pre-Exposure Prophylaxis Program: An Explorative Qualitative Study

Rico Januar Sitorus^{1*}, Anita Rahmiwati², Diana Dewi Sartika³, Elvi Sunarsih², Asri Maharani⁴

¹Department of Epidemiology, Faculty of Public Health, Universitas Sriwijaya, Palembang, Indonesia

²Faculty of Public Health, Universitas Sriwijaya, Palembang, Indonesia

³Department of Sociology, Faculty of Social and Political Science, Universitas Sriwijaya, Palembang, Indonesia

⁴Division of Nursing, Midwifery and Social Work, School of Health Sciences, University of Manchester and Manchester Academic Health Science Centre, Manchester, United Kingdom

Abstract

The prevalence of human immunodeficiency virus is high among female sex workers (FSWs) in Indonesia, underscoring the need for integrated prevention strategies supported by strong government policies. This study aimed to investigate FSWs' willingness to participate in a pre-exposure prophylaxis (PrEP) program. This qualitative study employed semi-structured interviews with 20 participants residing in Pangkal Pinang City, Indonesia (4 stakeholders and 16 FSWs), recruited through purposive sampling. Data were collected from July to September 2024. This non-probability sampling method was adopted due to the focus on specific study objectives and a targeted population. The analysis of the interviews revealed three theme clusters comprising eight themes. The identified clusters were government policy, knowledge of effectiveness and willingness to follow PrEP, and readiness for side effects and long-term compliance. Improving health services in areas where FSWs are concentrated is crucial for facilitating easier access with lower transportation costs. Furthermore, supporting the privacy of FSWs is crucial, and the cost of health screening before PrEP initiation should be waived to eliminate financial barriers and encourage participation in the PrEP program.

Keywords: human immunodeficiency virus infection, pre-exposure prophylaxis, sexual behavior, sex workers

Introduction

In 2021, the Joint United Nations Programme on HIV/AIDS (UNAIDS) set urgent goals for the international community aimed at eliminating human immunodeficiency virus (HIV) by 2030.¹ According to the most recent UNAIDS data, adolescent girls and young women aged 15–24 years in sub-Saharan Africa continue to be disproportionately affected by HIV, accounting for approximately 63% of all new HIV infections reported in this region in 2021.² In Indonesia, the HIV epidemic remains concentrated among four key populations, including female sex workers (FSWs). The 2018 Integrated Biological Behavior Survey reported varying prevalence rates across the country's populations. According to data from the 2018 and 2023 Integrated Biological Behavior Survey, a notable decline in HIV prevalence was observed among most key populations in Indonesia. Particularly, the HIV prevalence decreased from 25.8% in 2018 to 24.4% in 2023 among men who have sex with men, and a more pronounced reduction from 28.8% to 17.1% was observed among people who inject drugs and from 5.3% to 2.2% among FSWs. Conversely, the transgender population demonstrated an upward trend, with the HIV prevalence rising from 24.8% in 2018 to 28.9% in 2023, indicating a persistent vulnerability that warrants targeted intervention.³

Health protection measures are crucial, particularly for professions with a high risk of infectious diseases. Various preventive efforts have been made, including participation in the pre-exposure prophylaxis (PrEP) program,⁴ which is an initiative promoted by the UNAIDS as a principal strategy for HIV prevention and elimination of HIV transmission. The implementation of this program requires several clinical visits for screening, counseling, and monitoring.^{5,6} The combination of PrEP with consistent condom usage can achieve a prevention rate of approximately 95% among

Correspondence*: Rico Januar Sitorus, Department of Epidemiology, Faculty of Public Health, Universitas Sriwijaya, Palembang, Indonesia, E-mail: rico.januar@fkm.unsri.ac.id

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individuals at risk of HIV infection.⁷ PrEP using antiretroviral drugs is administered to individuals at high risk of contracting HIV. The PrEP program has been proven safe and effective in reducing transmission through sexual intercourse, particularly with tenofovir-based antiretroviral drugs.^{4,8,9} Tenofovir disoproxil fumarate and emtricitabine are nucleotide/nucleoside reverse transcriptase inhibitors used to treat HIV and hepatitis B virus infections. Additionally, these drugs are used in once-daily regimens for PrEP against HIV infection. Maintaining effective drug concentrations in vaginal and cervical tissues requires consistent adherence to the prescribed regimen.^{10,11}

By the end of 2019, of 180 countries with available data, 120 (67%) had incorporated the World Health Organization recommendations on PrEP into their national guidelines. During the same year, approximately 626,000 individuals were using PrEP across 77 countries, with 260,000 (41.6%) in the Americas and 213,000 (34.0%) in the African region. These data represent a 69% increase compared with the approximately 370,000 PrEP users reported in 66 countries in 2018.^{10,12} The readiness of FSWs to participate in the PrEP program is a key step in preventing HIV infection. However, the willingness to participate, acceptance of potential side effects, and maintenance of long-term adherence remain significant barriers. Several studies have examined FSWs' intentions to participate in the PrEP program in Indonesia. Kurniawan *et al.* reported low awareness of PrEP,¹³ and additionally, Pratiwi emphasized the need to strengthen self-confidence, social support, and access to health services to improve PrEP acceptance among FSWs.¹⁴

Although several studies have been conducted on PrEP in Indonesia, those specifically identifying predictors of FSWs' intention to participate in the PrEP program are limited. Therefore, this study aimed to address the challenges related to FSWs' readiness to participate in the PrEP program and the extent of governmental support provided through relevant policy measures. Additionally, this study aimed to comprehensively examine FSWs' knowledge and perceptions of PrEP effectiveness, as well as their willingness and preparedness to engage in the program, with a particular focus on their ability to manage potential side effects and maintain long-term adherence, which are crucial factors for the success of PrEP implementation. Furthermore, this study aimed to investigate how existing government policies facilitate and strengthen the delivery of PrEP initiatives among this population.

Methods

This qualitative study employed in-depth interviews and focus group discussions to collect data.¹⁵ Participants were recruited using a purposive sampling technique, targeting FSWs aged ≥ 18 years who were either aware of or potential candidates for PrEP use. The recruitment of FSWs was facilitated through collaboration with a non-governmental organization (NGO) based in Palembang City, Indonesia. Additionally, public health officers and program implementers were included to provide a policy-level perspective. Inclusion criteria included individuals who voluntarily consented to participate in this study, women employed as FSWs, and individuals aged ≥ 18 years residing in Pangkal Pinang City. The exclusion criteria included FSWs who were HIV-positive.

The participants were contacted, and interviews were arranged. Participants were categorized into four groups: FSWs, PrEP program managers at primary health care (PHC), doctors providing PrEP, and counselors from NGOs. In-depth interviews were conducted with the participants after providing explanations of the study objectives. Data were collected through face-to-face in-depth interviews from July to September 2024. FSWs constituted a hidden and hard-to-reach population, and informed consent was obtained before the interviews. The consent process included an explanation of the expected duration of the interviews and recording of the sessions. Informed consent was obtained from all participants before the interviews began. The initials were used to identify individuals and ensure confidentiality.

All interviews and discussions were conducted in the Indonesian language by trained researchers using a semi-structured interview guide. Each session lasted approximately 45–60 minutes and was audio-recorded with participants' consent. Field notes were taken to capture contextual information and non-verbal cues. A triangulation approach was employed to ensure data trustworthiness, involving comparisons across multiple sources (FSWs, program officers, and policymakers) and methods (interviews, focus group discussions, and document review). This approach enhanced the credibility and validity of the findings by allowing cross-verification of emerging themes from different data sources.

The recorded data were transcribed verbatim, entered into a coding sheet, and analyzed. A cross-check was conducted to ensure accuracy, clarity, reliability, and validity. Data were consistently managed and structured to support transparency, thoroughness, and credibility. The results of the in-depth interviews were analyzed using a structured process that began with transcript compilation and included five framework analysis steps: data introduction, thematic framework identification, data indexing, charting, mapping, and interpretation.¹⁶

Results

A total of 20 participants aged 23–45 years were included in this study, all of whom resided in Pangkal Pinang City. Of the 20 participants, 16 were FSWs, 2 were PrEP program managers at PHC, 1 was a doctor providing PrEP, and 1 was a counselor from an NGO. Furthermore, 80% of the participants were high school graduates, and the remaining 20% had completed university education. All FSWs were still actively serving guests and were HIV-negative. All FSWs (100%) were high school graduates, whereas 75% of the stakeholders had completed university, and 25% had completed senior high school.

In-depth interviews were conducted with the participants. The interview results were thematically grouped into three categories: government policy, knowledge of effectiveness and willingness to follow PrEP, and readiness for side effects and long-term compliance. These themes were derived to address the study objectives comprehensively (Table 1).

Table 1. Themes and Theme Clusters Derived from In-depth Interviews

Theme Clusters	Themes	Definition	Research question
Knowledge of effectiveness and willingness to follow PrEP	<ul style="list-style-type: none"> - Information about PrEP - Why and how to use PrEP 	Participants' understanding of how effective PrEP is in preventing HIV infection and their motivation or readiness to use PrEP as part of HIV prevention efforts	How do FSWs perceive their knowledge of the effectiveness of PrEP?
Readiness for side effects and long-term compliance	<ul style="list-style-type: none"> - Side effects of PrEP - How to maintain adherence to consumption while being a risk population - Healthcare worker support 	Participants' preparedness to cope with possible side effects of PrEP and their commitment to maintaining consistent, long-term adherence to the medication regimen	How willing and prepared are FSWs to participate in the PrEP program, particularly in coping with potential side effects and maintaining long-term adherence?
Government policy	<ul style="list-style-type: none"> - Availability of medicines in health facilities and easy access - Financial support for the supportive screening of PrEP users before consumption - Expanding access to health facilities providing PrEP 	Role of governmental regulations, strategies, and support mechanisms in facilitating the implementation, accessibility, and sustainability of the PrEP program within the national HIV prevention framework	What government policies support the implementation of the PrEP program?

How do Female Sexual Workers Perceive Their Knowledge of the Effectiveness of Pre-Exposure Prophylaxis?

Most respondents demonstrated limited awareness of PrEP use as an HIV preventive medication and lacked understanding of its effectiveness in reducing the risk of HIV transmission associated with their occupation. FSWs reported that NGOs that have been supporting them in accessing health services were the primary source of information about PrEP. Furthermore, respondents reported limited knowledge of how to obtain PrEP. These findings indicated that the overall understanding of PrEP and its effectiveness remained limited, leading to uncertainty in decision-making. Furthermore, most respondents were unaware of the reasons for taking PrEP, procedures for accessing it, its mechanism of action, and eligibility criteria for its use. The low level of knowledge of participants about the PrEP program was associated with low intention and desire to engage in the program, reflected in the following statement:

"I discovered about PrEP from an NGO that often visits us for HIV testing. I did not know what the program was or its purpose. I also do not understand how to access it." (AP, 23 years old, FSW)

Comprehensive information on PrEP should cover various aspects, including its definition, purpose, effectiveness, goals, eligibility criteria, requirements, service locations, prescribed medications in Indonesia, rules for taking PrEP, implementation models, and the differences between PrEP, post-exposure prophylaxis, and antiretroviral drugs. Participants reported that information on PrEP use and potential side effects remained limited, reflected in the following statement:

"I am still working and can serve 3–5 people in 1 week. When serving guests, sometimes I do not use a condom due to the customer's request. I am afraid of contracting HIV or syphilis and want to take PrEP for protection. However, I do not know how to obtain it, the costs, or the side effects of the medication. I have asked friends, and they did not understand." (SW, 32 years old, FSW)

How Willing and Prepared are Female Sexual Workers to Participate in the Pre-Exposure Prophylaxis Program, Particularly in Coping with Potential Side Effects and Maintaining Long-Term Adherence?

The perspectives of FSWs on PrEP-related side effects, strategies for maintaining adherence among key risk populations, and the role of health workers' support were explored to address this question. The success of the PrEP program was highly influenced by individual readiness to cope with potential side effects and their ability to maintain consistent long-term use. The readiness to manage side effects and maintain long-term adherence is a key determinant of PrEP effectiveness among FSWs. The readiness to manage side effects is often influenced by health literacy, understanding of the benefits and risks of medication, and previous experiences with prophylactic or antiretroviral therapy. Long-term adherence to PrEP remains a significant challenge. The effectiveness of PrEP largely depends on consistent medication use, and poor adherence diminishes protection against HIV. Several factors, including high occupational mobility, irregular schedules, limited access to healthcare services, and lack of support from intimate partners, influenced adherence of FSWs to PrEP. Support and encouragement from health workers not only strengthens individual preparedness to manage side effects but also fosters a supportive social environment for sustained PrEP use.

FSWs reported that they were informed about the potential adverse effects of PrEP use, including nausea, dizziness, renal impairment, and hepatic dysfunction. Additionally, they reported that sustaining long-term adherence to PrEP is a considerable challenge.

"I have heard from friends that PrEP could lead to kidney disease, nausea, drowsiness, and weakness for 3 days, which made me apprehensive about its usage. If consumed, I will not be able to work serving guests, which would prevent me from earning money." (AA, 26 years old, FSW)

The competence of health workers and companions was crucial for providing accurate information about PrEP usage, potential side effects, and the importance of consistent adherence. It played a role in increasing participants' readiness to manage side effects and maintain long-term compliance.

"I accessed the free PrEP provided to us because I understood that using it could protect me from contracting HIV and other STIs. Committing to regular use has been a priority for me, specifically as I continue to actively serve clients." (SD, 25 years old, FSW)

"I actively promote PrEP and encourage many of my friends to participate and benefit from the program. Additionally, I strive to show others how easy it is to access these services and emphasize the importance of health." (MR, 23 years old, FSW)

Individual motivation to adhere to PrEP guidelines was crucial for compliance with consumption among at-risk participants. The main reasons for complying with consumption were to avoid transmission of HIV and other sexually transmitted infections (STIs), maintain good health, and earn a living.

"Commitment to taking PrEP is essential due to the associated risk, specifically when serving 2-5 guests each week. Using PrEP plays a crucial role in preventing infections, and the counselor consistently provides reminders to use it routinely before engaging with guests." (ER, 26 years old, FSW)

Support from health workers played an important role in increasing participants' intention to engage in the PrEP program. Most participants, including those handling HIV/AIDS programs for FSWs and program recipients, reported encouraging each other to consistently support the initiative to ensure the inclusion of many FSWs in the program. This approach enhanced awareness of the dangers of HIV infection, thereby promoting compliance with the use of PrEP.

"I am responsible for overseeing HIV/AIDS programs targeted at the FSW population. As part of my role, I actively encourage and support others to participate in the program or access free PrEP services. The program was designed to raise awareness about HIV and other STIs, empowering FSW to protect themselves from infection while ensuring their ability to work safely." (RR, 27 years old, program manager)

What Government Policies Support the Implementation of the Pre-Exposure Prophylaxis Program?

The PrEP program has been implemented nationally in Indonesia since 2021, and it was introduced in Pangkal Pinang City in June 2023. The local government has demonstrated a strong commitment to supporting the program as part of its broader HIV prevention strategy. As a city with high tourism activity and population mobility, Pangkal Pinang faces elevated risks of HIV transmission. In alignment with national policy, primary care facilities, including PHC, have begun providing PrEP services as a part of the city's public health response. The sustained availability of PrEP medication was a key indicator of the government's commitment to HIV prevention. The government, through the Ministry of Health

and the National HIV/AIDS Program, is responsible for maintaining an uninterrupted supply chain encompassing drug procurement, distribution, and consistent provision across health facilities. The expansion of health facilities providing PrEP is crucial for enhancing coverage and accessibility.

“Participants stated that the provision of antiretroviral prophylaxis, including PrEP, has been regulated in the Minister of Health Regulation Number 23 of 2022. In 2024, it was expanded to several provinces (cities and districts), including Pangkal Pinang.” (AA, 45 years old, program manager)

The procurement of PrEP drugs is entirely the responsibility of the central government (Ministry of Health). The Provincial and City/District Health Offices plan and request drugs, distribute them to the health facilities, and monitor/supervise the services implementing the PrEP program. The available supply of medication varies according to the situation and population. Therefore, the amount cannot be determined. Regions with a higher proportion of at-risk populations receive a larger allocation of PrEP medication. The PrEP service was simplified by streamlining the service procedures. For example, individuals seeking access to PrEP only need to present proof of identity or a referral from a community-based companion. This program was implemented in an integrated manner with HIV and STI management, emphasizing collaboration between service providers and the community. PrEP drugs are available and provided free of charge at all designated health facilities in Pangkal Pinang City, Indonesia.

“Participating in PrEP was not difficult; information about individuals who gain access to the PrEP program is also obtained from their companions who accompany them to health facilities.” (RR, 45 years old, program manager)

“Before taking PrEP medication, FSWs were subjected to a health examination and received education on proper usage, side effects, and dosage. The medication was provided for free when the eligibility criteria were met.” (NN, 34 years old, doctor)

FSWs reported that individuals were required to meet certain criteria to access PrEP, including HIV-negative status based on test results in line with the Standard Operating Procedures in Indonesia, and no clinical signs of acute HIV infection. Additionally, individuals aged <18 years need to be accompanied by a guardian or companion. Participants reported that the availability of time and financial resources to undergo preliminary health assessments, as well as the proximity of service facilities, were critical factors influencing their willingness to join the program. This was reported by most study participants:

“The costs for HBs Ag, SGOT, SGPT, and urea creatinine examinations are quite high, and I cannot afford them, particularly as I am burdened with debts to my boss. If the government could cover these expenses, it would provide peace of mind for us.” (SA, 35 years old, FSW)

Stakeholders reported plans for a phased expansion of PrEP service providers to enhance accessibility. Additionally, PrEP implementation was integrated with HIV and STI management, indicating cooperation between service providers and the community.

“Currently, PrEP services in Pangkal Pinang are available at 9 PHCs and one hospital. We hope that in the future, private services such as clinics can provide this service.” (E, 43 years old, program manager)

“To access PrEP, you can visit the PHC. For other examinations, you are referred to a hospital.” (WS, 45 years old, program manager)

Discussion

This study used a qualitative approach and identified three main issues: the need for government policy support to promote PrEP use, the need to increase knowledge about PrEP's effectiveness and willingness to take it, and the importance of readiness to manage side effects and maintain long-term compliance. The PrEP program has been adopted in Indonesia since 2021. However, it has only been implemented in 10 provinces and 22 cities/districts. PrEP services are provided at 10 health facilities in Pangkal Pinang City, including 9 PHCs and 1 hospital.¹⁷ Bangka Belitung Province, particularly Pangkal Pinang City, has a significant FSW population, necessitating the local government's readiness for the successful implementation of the program. Consistent with this study, the PrEP program has been implemented in South Africa and has become a positive, highly anticipated prevention option among FSW participants, who support its implementation in their communities.¹⁸

The lack of comprehensive government financial support is a major obstacle. Although PrEP is provided free of charge, users must undergo a clinical examination before initiating the regimen, which the government does not fund. This financial barrier hinders the program's accessibility, particularly among individuals working in the commercial sector. The same results revealed by a previous study examined the cost of clinical examinations as the main factor hindering the implementation of PrEP despite the free medication.¹⁹

In this study, participants emphasized the need for strengthened collaboration between central and local governments to improve access to health services through population-targeted incentives and more flexible appointment scheduling systems. Furthermore, outreach efforts, including direct visits to their residences, can facilitate the recruitment of hard-to-reach populations. Additionally, participants emphasized the importance of engaging NGOs that have established trust and knowledge about these populations. Financial support, such as incentives, should be provided to enhance accessibility. Such incentives can include transportation subsidies for participants and performance-based funding for health facilities that deliver PrEP services to key populations. These factors can help reduce structural and economic barriers and promote more equitable participation in prevention efforts.²⁰

Participants reported difficulties obtaining reliable, on-demand information about the program. They reported reliance on online resources or peers for guidance. The lack of official guidance raised concerns about potential dosing errors (e.g., not taking the initial dose or forgetting to take the final dose). These uncertainties prompted some individuals to opt for daily PrEP use as a precautionary measure.²¹ This study identified knowledge about PrEP as a factor influencing FSWs' participation in the program. Participants recognized that participation could reduce the risk of HIV acquisition. Most FSWs lacked awareness of PrEP. The medication is given to men or women aged 15 years or older who are at a high risk of contracting HIV. It includes dual antiretroviral therapy combining emtricitabine (200 mg) and tenofovir disoproxil fumarate (245 mg) in a tablet form.²²

This study supported previous findings, which revealed that limited knowledge of HIV service programs hinders the desire to access health services and participate in prevention efforts.^{23,24} PrEP is effective in preventing HIV infection. However, its high cost poses a significant barrier to its widespread daily use. Providing detailed information on the associated expenses, including baseline evaluations such as liver and kidney function tests and HIV screening before initiation, can offer a more comprehensive understanding of the financial burden and the feasibility of widespread implementation.²⁵⁻²⁷

Understanding PrEP is crucial, particularly for identifying eligible individuals. In addition to high-risk populations, health workers require comprehensive knowledge. Health professionals should recognize that PrEP is the primary prevention strategy for HIV-negative individuals with risk factors. Incorrect prescription of medications to patients with HIV poses a significant public health problem and can lead to antiretroviral resistance. Although this study did not identify any incorrect PrEP prescriptions, measures must be taken to mitigate the risk of antiretroviral resistance. Previous studies have identified the need to provide clinicians with training in PrEP management, follow-up laboratory testing, and counseling.^{28,29}

This study confirmed that PrEP drugs have side effects. The participants emphasized that they were afraid to take this drug because of its side effects, such as nausea, dizziness, and kidney impairment. These findings underscore the need to provide comprehensive knowledge about the benefits and management of side effects of PrEP, along with guidance from healthcare providers on symptom monitoring and coping strategies. These findings were consistent with a previous study reporting that fear of side effects, misunderstanding about PrEP, and challenges in taking the pill every day were factors influencing trust in PrEP and its providers.³⁰

Key populations using PrEP require support from health providers to maintain PrEP adherence. This study showed a lack of regular consumption due to fear and boredom associated with routine consumption. These findings are consistent with a previous study stating that individuals who stopped taking PrEP resumed consumption on demand.³¹ The support of the health service system and providers is necessary for the program's success. Furthermore, ongoing sexual health testing and discussions about sexual behavior are essential, particularly for individuals who are discontinuing PrEP. Additionally, cost support, which has been identified as a factor influencing decisions regarding usage, is required.³²

This study provided valuable insights into FSWs' knowledge, attitudes, and preparedness for PrEP, as well as context-specific information on the barriers and enablers that influence its uptake. However, this study had several limitations. First, it included a relatively small and potentially homogeneous sample of FSWs residing in Pangkal Pinang City, which may limit the generalizability of the findings. Second, the reliance on self-reported data might have introduced social

desirability and recall bias. Third, this study might have subject to selection bias from recruitment through peer networks, interviewer bias, and recall bias, which were mitigated through neutral interviewer training, probing questions, and triangulation with policy documents and service records.

Conclusion

PrEP is available in Pangkal Pinang City at 9 PHCs and one hospital with a high patient population. However, persistent barriers, such as the distance between FSWs and health facilities, result in unaffordable transportation costs. Additionally, the cost of health screening borne by individuals before initiating PrEP, and fears that their identity will be disclosed, hinder access. These factors significantly influence FSWs' intention and readiness to participate in the PrEP program. Further studies involving diverse key populations, such as transgender women and men who have sex with men, are needed to evaluate interventions targeting side effects, financial barriers, and stigma and to assess the impact of government policies and service integration on PrEP accessibility and long-term sustainability.

Abbreviations

UNAIDS: Joint United Nations Programme on HIV/AIDS; HIV: human immunodeficiency virus; FSW: female sex workers; PrEP: pre-exposure prophylaxis; NGO: non-governmental organization; PHC: primary health care; STIs: sexually transmitted infections.

Ethics Approval

This study was approved by the Faculty of Public Health, Universitas Sriwijaya (approval number: 197/UN9.FKM/TU.KKE/2024).

Competing Interest

The authors declare that they have no significant competing financial, professional, or personal interests that might have affected the performance.

Availability of Data and Materials

All data and related materials from this study are available and can be provided by the first author.

Authors' Contribution

RJS contributed to the conceptualization, methodology, data analysis, and manuscript writing. AR contributed to the draft revision. DDS and ES revised the Methods and Discussion sections. DDS contributed to the writing style and language adjustments. AM contributed to the corrections in English.

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