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In the Shadows, But Not Left Behind: Female Sex Workers' Acceptance of Social Media for HIV Prevention in Northwest and Southwest Provinces, Cameroon

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IN THE SHADOWS, BUT NOT LEFT BEHIND: FEMALE SEX WORKERS' ACCEPTANCE OF SOCIAL MEDIA FOR HIV PREVENTION IN NORTHWEST AND SOUTHWEST PROVINCES, CAMEROON

by

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A DISSERTATION

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IN THE SHADOWS, BUT NOT LEFT BEHIND: FEMALE SEX WORKER'S ACCEPTANCE OF SOCIAL MEDIA FOR HIV PREVENTION IN NORTHWEST AND SOUTHWEST PROVINCES, CAMEROON

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HEALTH BEHAVIOR - HEALTH EDUCATION AND PROMOTION

ABSTRACT

The purpose of this dissertation was to evaluate the acceptance of social media in HIV prevention education for female sex workers in Cameroon. The objectives included: (1) provide a review of literature on the use of social media in HIV prevention education among Female Sex workers (FSWs); (2) determine the acceptance of Secret Facebook Group (SFG) for HIV prevention education among FSW in Cameroon; and (3) explain the acceptance of SFG in HIV prevention education and social media platform alternatives to SFG in Cameroon.

Utilizing a sequential explanatory mixed methods design, three methods were employed for this dissertation and guided by the combined technology acceptance model (TAM) and the theory of planned behavior (TPB): (1) a scoping review explored the current landscape of the literature; (2) quantitative data analysis determined acceptance of SFGs in HIV interventions among FSWs; and (3) qualitative research explained FSWs acceptance of social media in HIV prevention education among FSWs in Cameroon. The study design ensured participants' perspectives were fully considered. The qualitative research was able to explore quantitative results in more detail through interview questions informed by quantitative research results.

Results from the scoping review included 10 articles, which suggest a new body of literature. Quantitative analysis of surveys distributed to FSWs revealed the majority

(75%) selected 5 stars for the acceptance of Secret Facebook Group (SFG) in HIV prevention. Qualitative analysis expressed privacy, phone airtime, and fiscal and social support as key attributes to accepting SFG as a tool in HIV prevention education. WhatsApp was mentioned as top social media platform alternative to SFG.

The limitations of the research were small sample sizes, only English publication considerations in the scoping review, and self-reported survey and interview responses that were shared one year after the parent project happened. Therefore, the results were not generalizable.

In a future manuscript, the integration of the quantitative and qualitative phases will be conducted, and additional research will inform design and implementation of social media interventions that address HIV in vulnerable populations in SSA. In addition, SFG based HIV project should be scaled in other areas of Cameroon.

Keywords: HIV prevention, social media, female sex workers, Cameroon, acceptance

DEDICATION

To me: Be proud of where you come from, how far you have come, and what you have been able to accomplish. Thank you for shining a light on digital health and its impact in and on vulnerable populations. This is just the beginning. As you begin the second half of your life, stay forever grateful for the love, patience, endurance, and family (inherited and acquired) you have through your journey.

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LIST OF ABBREVIATIONS

C-TAM-TPB	Combined Technology Acceptance Model and Theory of Planned Behavior
FSWs	Female sex workers
NLC	New Light Club
PEOU	Perceived ease of use
PU	Perceived usefulness
PrEP	Pre-exposure Prophylaxis
SFG	Secret Facebook Group
SSA	sub-Saharan Africa
TAM	Technology Acceptance Model
TPB	Theory of Planned Behavior
WHO	World Health Organization

INTRODUCTION

Though progress has been made in tackling the HIV epidemic, female sex workers (FSWs) still represent an approximately 12% of the those living with HIV globally. Female sex workers face substantial barriers in accessing information to prevent HIV because of stigma, discrimination, and criminalization (The Lancet, 2022). Therefore, FSWs are often driven into the shadows by fear and remain underserved by the HIV response around the world, especially in sub-Saharan Africa (SSA).

In the West-Central African country of Cameroon, an estimated 2% of its women do sex work and roughly 24% of those women are living with HIV (Billong et al, 2019, Bowring et al, 2019). UNAIDS reports Cameroon's coverage of HIV prevention programming for sex workers was not well reported or documented (UNAIDS, 2022). So, there is a critical need to better understand HIV prevention programming for sex workers in Cameroon.

Impact of mHealth in sub-Saharan Africa

Mobile phone ownership is widespread across the world with rates as high as 91% in South Africa. As of 2017, 85% of Cameroon's population were mobile phone subscribers (Ngamita, 2021). In 2020, Cameroon Minister of Posts and Telecommunications (MINPOSTEL) Minette Libom Li Likeng stated there is a 40% smartphone penetration rate. In addition, 34% of Cameroon's population are mobile internet subscribers (GSMA, 2021). Individual face-to face level interventions such as

personal messages and behavior change tools can be modified for delivery via mobile devices. Mobile technologies permit intervention delivery and interaction to capture attention when it is most relevant (Free et al., 2013). Nevertheless, mobile applications ("apps") programs designed to run on mobile devices, are still in their infancy for use within HIV prevention (Muessig et al., 2016) and may not reach people with limited means in Cameroon.

Social Media in Cameroon and sub-Saharan Africa

Social media platforms, such as Facebook and Twitter, are used as part of global HIV prevention efforts to provide users the opportunity to share information through global exchanges anonymously and have a neutral platform for engagement (Tso et al., 2016). Additionally, increased social support through social media improve access to HIV prevention services and build a community with peers, which is a critical component in controlling the spread of HIV (Hailey & Arscott, 2013; Leon et al., 2011). Nevertheless, HIV prevention interventions delivered through social media platforms are not well-documented or validated in SSA.

In April 2021, a systematic review was published describing the use of social media and/or specific communication campaigns to increase PrEP awareness among young Black and Latinx men who have sex with men (MSM) and women. Eight articles were analyzed and showed social media as a useful tool to increase PrEP awareness, uptake, and adherence among difficult to reach young racial and sexual minority men and women in the United States (Kudrati et al., 2021). Additionally, FSWs have turned to online private groups and forums due to their need of anonymity due to stigma and

criminalization (Ma et al., 2017; Taylor, 2022). Such platforms may include secret Facebook group (SFG), which is a private group on Facebook in which no aspect of the group is publicly visible. New members must be added or invited by current members to join, and only members can see the content of group posts. Nevertheless, despite the widespread utilization of social media, little is known about the acceptance of social media in the dissemination of HIV prevention information among marginalized groups like FSWs.

Acceptability and Acceptance

Although a few active SSA programs in South Africa and Ghana utilize mobile health (mHealth) strategies to engage FSW in HIV prevention, most use text messaging as the primary mode of intervention delivery (You et al., 2020))., Nevertheless, the acceptance of delivering HIV prevention interventions to FSW via advanced digital technologies has not been well defined or studied to date (You et al., 2020).

For better comprehension of the dissertation research, commonly intertwined terms must be clarified (Nadal et al., 2019). *Acceptability* is defined as favorable or unfavorable tendencies about the intervention's technology, service, or tool *before* engagement or implementation (Nadal et al., 2019). *Acceptance* is defined as favorable or unfavorable tendencies about the intervention's technology, service, or tool *after* engagement or implementation (Nadal et al., 2019). The key difference in the definitions is time. Acceptability is strongly related to the *beliefs about the potential consequences* of a technology/service/tool *before an intervention is implemented or introduced* to a group (Shuitema, 2010). Acceptance is strongly related to *beliefs about the effects* of the

technology/service/tool *after the intervention has been implemented or introduced* to a group (Shuitema, 2010). This dissertation focused on *acceptance* to better understand the effects of social media in delivering information about HIV prevention to FSWs after the implementation of a pilot project.

Parent Project

A need for a comprehensive approach to understanding and improving HIV preventive outcomes for FSW in Cameroon resulted in a study titled *Pilot Project on Use of Social Media for HIV Prevention among Female Sex Workers in Southwest and Northwest Cameroon; studying its potential as PrEP roll out tool* (Principal Investigator: Dr. Laia Jimena Vazquez Guillamet). The protocol and project were reviewed and approved by the Cameroon Baptist Convention Health Board (CBCHB) Institutional Review Board (IRB) (IRB2019-16) and the Institutional Review Board of the University of Alabama at Birmingham (IRB-300004333). The purpose of this pilot study was to evaluate the potential of a social media phone app with privacy features to serve as HIV prevention and PrEP roll out tool among FSW in Cameroon.

The research project took place in Northwest and Southwest Provinces of Cameroon, which consist of predominantly Anglophone populations. Cameroon's population is approximately 30 million (CIA, 2023) - most of the population concentrated in the urban areas of the West and North, and sparsely populated in the interior. In Cameroon, 77.1% of the population aged 15 and over can read and write (male: 82.6%; female: 71.6%). In 2021, UNAIDS reported an estimated 500,000 people living with HIV in Cameroon; and 400,000 of them know their status (UNAIDS, 2021). Women in the

age group 15 to 29 have a prevalence at least triple that of males in the same age group (Wirsiy, 2019). Approximately 71,000 sex workers in Cameroon estimated living with HIV, and the most common mode of transmission was found to be unprotected heterosexual intercourse (UNAIDS, 2021; Wirsiy, 2019). An estimated 13,000 AIDS-related deaths were reported in Cameroon (UNAIDS, 2021).

The parent study was a cluster-randomized designed study conducted during October 2020 to April 2021, which assigned participants into study groups based on geographical location (Bamenda representing Northwest Cameroon and Mutengene representing Southwest Cameroon. The study evaluated the potential of SFG to raise PrEP awareness and complement HIV prevention strategies among FSWs.

Sixty (60) adult HIV-negative FSW participated. They were members of the New Life Club (NLC), a commercial sex workers assistant program in Northwest and Southwest Cameroon. The inclusion criteria comprised of NLC members, smartphone owner, adult age (18 years or older), and good command of the English language. There were two group arms: an intervention arm with 40 participants and 20 participants in the control arm. The intervention had a SFG platform for confidentiality. Two SFGs were created for the groups without revealing participants' identity. Each of the two arms had study groups A and B from Bamenda and Mutengene. SFGs released 12 module-videos on HIV prevention in Pidgin English (local dialect) weekly over eight weeks. The module-videos included messages on HIV, pre-exposure prophylaxis, post-exposure prophylaxis, condom use, data on sex work around the world and in Sub-Saharan Africa, and work-related stigma. Participants commented on the messages and communicated

with each other on the group chat. There were three facilitators who were trained in moderating the SFGs posts and comments and recruited participants for the project.

The study outcomes (HIV PrEP awareness, project retention, stigma, social cohesion, and condom use) were measured through pre- and post-intervention questionnaires delivered to all study participants. In-person surveys were administered at baseline, immediate post-intervention, and three months post-intervention. Stata IC/version 14.2 was used to analyze the data. Preliminary data analysis was completed. Respondents rated the main outcome, PrEP awareness, and their retention of HIV knowledge using a Likert scale. It was found that the use of a social media HIV prevention tool tailored to FSWs in Cameroon improved PrEP awareness with good retention of knowledge, and many participants agreed to recommend the intervention to other FSWs. Currently, a manuscript reporting the findings is being prepared for publication.

The parent project results highlighted the need to explore FSWs' perceptions about social media in HIV prevention education. This dissertation research specifically focused on FSWs' acceptance of social media in HIV prevention education in Cameroon.

Dissertation Purpose

This research consisted of a scoping review and a sequential explanatory mixed method study evaluating FSWs' acceptance of social media in HIV prevention education in Northwest and Southwest provinces, Cameroon. This dissertation, comprised of three aims aligned, is described below:

- Aim 1: Identified how social media in HIV prevention education is used among FSWs globally based on review of literature
- Aim 2: Determined the acceptance of Secret Facebook Group (SFG) for HIV prevention education among FSW in Cameroon.
- Aim 3. Explained the acceptance of SFG in HIV prevention education and identified alternative social media platforms to SFG.

Conceptual and Theoretical Frameworks

The diagram below graphically presents the conceptual and theoretical frameworks for the study and how they apply to each research aim. The Theory of Planned Behavior (TPB) and the Technology Acceptance Model (TAM), both of which share the theoretical basis of the Theory of Reasoned Action (TRA), guided the dissertation study.

The TRA predicts intention to perform a behavior and explains behaviors that self-control can be exerted. The attitude about behavior influences behavioral intention and ultimately expected outcome that is subjectively evaluated for its risks and benefits. The TPB predicts and explains health behaviors that depend on both intention and behavioral control (Boston University, 2019). The TPB comprises six constructs:

1. Attitudes - consideration of the outcomes of performing the behavior.
2. Behavioral intention - motivational factors that influence a given behavior
3. Subjective norms - beliefs about approval of behavior
4. Social norms - normative/standard behavior in a group of people

5. Perceived power - perceived factors influencing behavior
6. Perceived behavioral control - perception of performing behavior

The TAM is the dominant model in technology acceptance and explains variance in the intention to use or the use of technology (Khan et al., 2021). Its two fundamental factors (Davis et al., 1989) are:

1. Perceived usefulness (PU) - belief the use of a particular system improves job performance.
2. Perceived ease of use (PEOU) - expectation a particular system is free of unproductive effort.

This framework contextualized the TPB and TAM by combining internal and external variables (beliefs, norms, usefulness, and perceptions) from each model to examine the social media in HIV prevention (Figure 1). The combined Theory of Planned Behavior and the Technology Acceptance Model (c-TAM-TPB) model guided the dissertation study. This model comprises six main constructs:

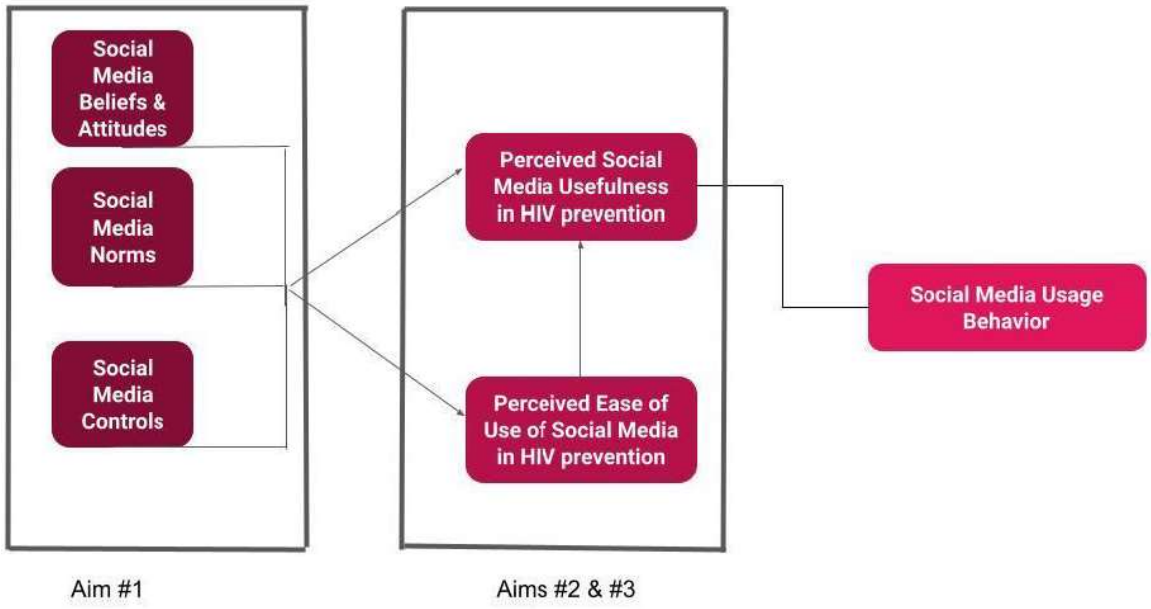
1. Social Media Beliefs/Attitudes
2. Social Media Norms
3. Social Media Controls
4. Perceived Social Media Usefulness in HIV Prevention Education
5. Perceived Ease of Use of Social Media in HIV Prevention Education
6. Social Media usage Behavior

Constructs 1-3 were explored in the scoping review (research aim 1). Constructs 4-6 informed data collection via questionnaire and interviews for research aim 2 and 3. This approach allowed for better comprehension of what drives social media acceptance in HIV prevention and assists in developing and improving social media-based HIV prevention interventions. The conceptual framework depicted the possible factors influencing social media's perceived usefulness and usage behaviors in HIV prevention interventions. In addition, it illustrated the conceptual research model.

Aim 1 was a literature review revealing social media beliefs (favorable or unfavorable evaluation of social media use, motivation to use social media); norms (approval or disapproval of social media use, social media engagement, customary/normative social media use among FSWs); and controls (perception of ease to use social media) in HIV prevention. Aim was a quantitative study focused on perceived social media usefulness and the ease of use of social media in HIV prevention. Aim 3 was a qualitative study expounding on the results of the quantitative study. Social media usage behavior represents the predicted response by perceived usefulness of social media, which is influenced by stimuli consisting of internal and external factors of social media use.

Figure 1

Conceptual and Theoretical Dissertation Model



This dissertation research consisted of a scoping review and a mixed method study evaluating FSWs acceptance of social media in HIV prevention. The scoping review was aligned with Aim 1 and followed the Arksey and O'Malley (2005) scoping review methods, which entails the following:

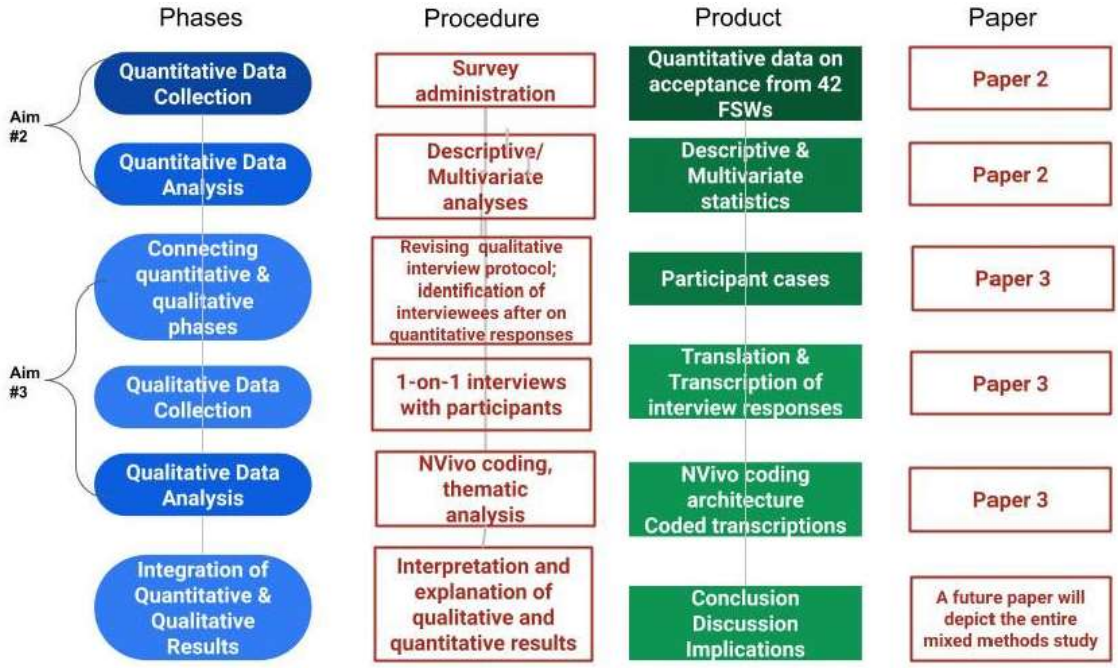
1. Define the research question
2. Identify relevant studies through a thorough and broad search including electronic databases
3. Use a study selection process that includes inclusion and exclusion criteria
4. Extract data using defined fields
5. Summarize and report findings

I consulted with Dr. Kathryn Kaiser of the Department of Health Behavior for her assistance and guidance to complete the scoping review.

Aim 2 and 3 utilized sequential explanatory mixed methods design. This design employed quantitative research defining FSWs' acceptance of SFG in HIV prevention among FSWs and qualitative research explaining FSWs' acceptance of SFG and identifying alternative social media platforms. The impact of SFG acceptance among FSWs was explored by conducting a survey about perceived ease of use of SFG, perceived usefulness of SFG, and acceptance that were followed by semi-structured interviews to explore further these concepts. This is one of the first mixed method acceptance evaluation of social media in HIV prevention for female sex workers in Cameroon (Gesser-Edelsburg, 2020). The dissertation research aims 2 and 3 reflected the characteristics of mixed methods identified by the mixed methods literature (Ivankova, 2014; Ivankova et al., 2006; Johnson & Onwuegbuzie, 2004; Tashakkori & Teddlie, 2010).

Figure 2

Research Sequential Explanatory Mixed Methods Design



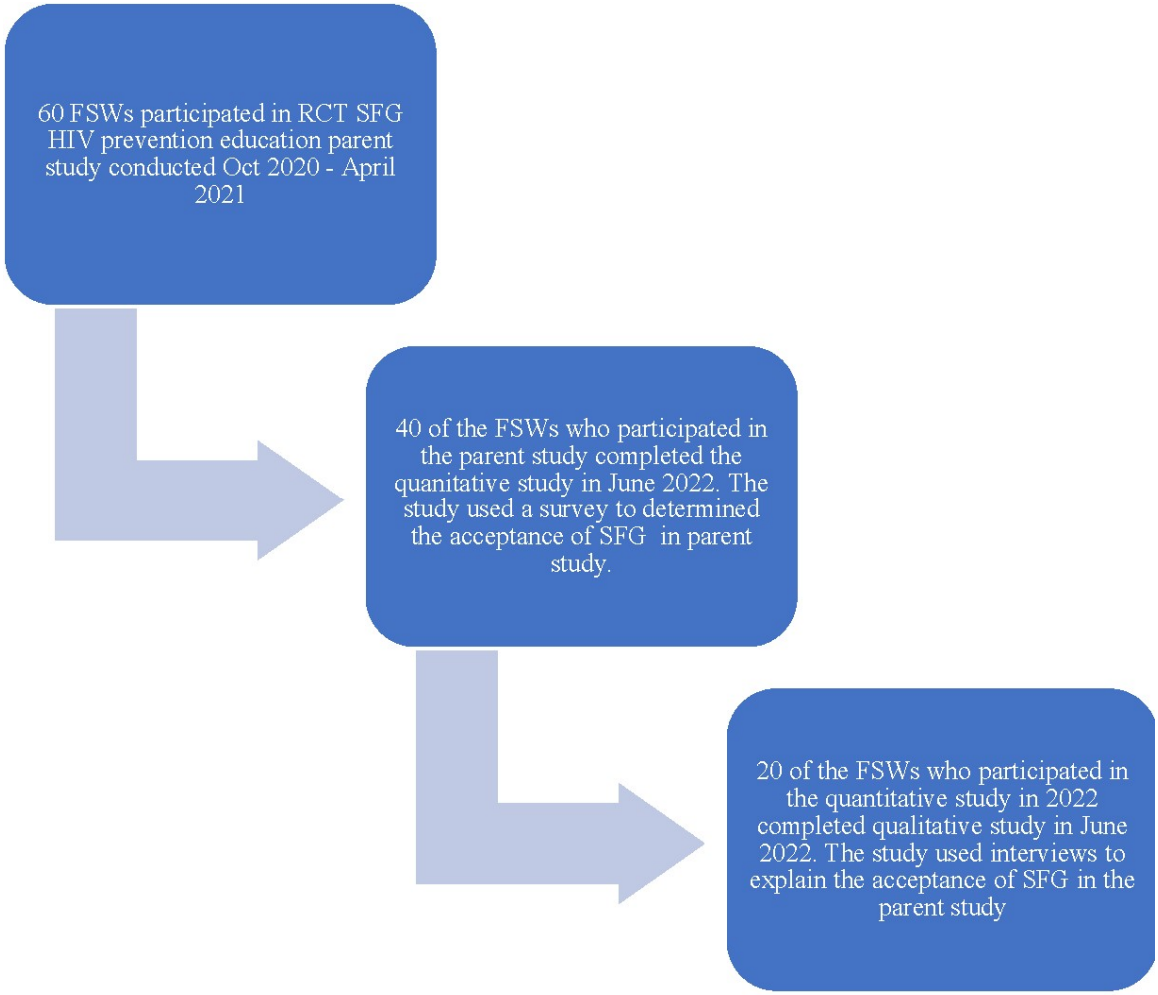
The study aimed to first determine and then explore the reasons for the acceptance of SFG in HIV prevention project targeting FSWs. Figure 2 displays a design that employed a quantitative research approach defining the acceptance of SFG in HIV prevention among FSWs (Creswell 2005; Teddlie & Tashakkori 2020). The quantitative strand was the first part of the mixed methods study. This strand included data collection though convenient sampling of FSWs who participated in the SFG HIV parent project. In addition, a survey was administered to the sample population and descriptive statistics was completed. The results are reported in Paper 2 of the dissertation.

Through qualitative research, social media alternatives, and factors that influence participants' social media experience were explored (Figure 2). The qualitative strand was the second part of the mixed methods study. Interview participants were selected

from the sample of participants who responded to the survey. Next, the results of the survey were used to revise the interview protocol and one-to-one interviews were conducted. Input and coding of responses into NVivo followed and thematic analysis was completed. The results are reported in Paper 3 of the dissertation. The integration of both quantitative and qualitative methods drew on the strengths of participants providing a complete picture of FSW's social media acceptance in HIV prevention education. The final summary of integrated results will be reported in a future paper. In addition, Figure 3 displays a flowchart of study participants who participated in the parent study and the dissertation quantitative and qualitative studies.

Figure 3

Study Participant Flowchart



A sequential explanatory mixed methods design using both quantitative and qualitative approaches was best suited to gain a deeper comprehension of FSWs' acceptance of social media in HIV prevention education. This dissertation includes papers addressing each of the aims mentioned above as well as a summary of findings, including a preliminary integration of the mixed methods.

PAPER 1: A SCOPING REVIEW OF SOCIAL MEDIA USE IN HIV PREVENTION EDUCATION FOR FEMALE SEX WORKERS

by

HASSANATU BLAKE, KATHRYN A. KAISER, ANN E. MONTGOMERY, PAULINE JOLLY, NATALIYA IVANKOVA, JODIE A. DIONNE, TAMIKA SMITH, TENEASHA WASHINGTON, MYKAYLA DAVIS

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Abstract

Introduction: Female sex workers (FSWs) continue to experience great burden from HIV, despite advancements in HIV prevention. According to UNAIDS Fact Sheet 2022, the risk of acquiring HIV is 30 times higher for FSWs than adult women. Therefore, the need to achieve global control of the HIV pandemic through prevention points to FSWs as a priority population. Mobile health (mHealth), including social media, interventions have been utilized to engage FSW in HIV prevention. However, social media-based HIV prevention interventions have not been well studied to date. The goal of this scoping review is to better understand the current landscape of the literature and identify gaps in knowledge of digital health interventions utilized by FSWs at risk for contracting HIV. **Methods:** Online databases were used to identify 451 papers published globally in 2006-2022, from which we selected 10 publications that included social media, HIV, and FSWs. Arksey and O'Malley (2005) guidelines informed the methodology of the scoping review. We extracted demographic data and evaluated interventions for any theoretical basis for the use and acceptance of social media. **Results and Discussion:** Ten unique publications were reported in 3 conference abstracts and 7 full text articles. The studies of the publications were conducted during a 5-year span (December 2016 to July 2022) in 6 African countries -- Tanzania, Kenya, Uganda, Nigeria, South Africa, and Cameroon; 2 Asian countries -- Vietnam and Indonesia; and the United States of America. The social media platforms used include Facebook, Instagram, Twitter, Zalo, Jichunge, and WhatsApp. The review of outcomes/measures was guided by C-TAM-TPB model. The review highlighted the social media norms construct of the model but lacked information about social media beliefs and controls in HIV prevention among FSWs.

Conclusions: The findings from this review suggest a relatively small body of recent literature about social media in HIV education among FSWs. Social media norms were investigated and associated with location, time, and outreach. The findings suggest: (1) location is linked to the availability of resources to access social media, (2) the potential of social media's impact will be better understood as more literature is published over time, 3) social support increase shared experiences as pathways to improve health. This review is preliminary and more research is needed.

INTRODUCTION

Worldwide, Female sex workers (FSWs) are 30 times more likely to acquire HIV than other women (UNAIDS, 2020). FSWs is a key population which requires targeted and comprehensive services to address HIV because they face reduced access to HIV prevention methods, treatment, and care services (WHO, 2022). Other key population groups include men who have sex with men, transgender diverse people, sex workers, people who inject drugs and people in prisons and other closed settings (WHO, 2022). Legal policies and practices, lack of funding for research and HIV programs, and human rights violations and discrimination continue to challenge key populations', particularly sex workers' abilities to protect themselves, their families, and their sexual partners from HIV (Beyrer, 2015).

In resource-limited settings, HIV prevalence among FSWs is estimated at 12%, with odds of infection 14-fold higher than among women in the general population (Chemaitelly et al., 2020). African FSWs experience the greatest burden from HIV, with HIV prevalence among FSW in SSA estimated at 36.9% (Beyrer, 2015). Pre-exposure prophylaxis (PrEP) persistence among FSW has been low, which may be attributed to lack of awareness, accessibility, and stigma of PrEP (Rao et al., 2022). These realities highlight the need to achieve global control of the HIV pandemic through FSWs prevention programs.

There are over 8 billion mobile phone subscriptions worldwide and numbers are growing exponentially in low- and middle-income countries (Alvare, 2022). Mobile health (mHealth) interventions are utilized to engage and retain FSW in HIV prevention (You et al., 2020). In Western countries, previous research on the use of social networking groups (Instagram, Facebook, and custom mobile applications) emphasized their general feasibility in mHealth interventions. Yet, the acceptance of social media in HIV education interventions for FSWs had not been well studied to date.

This scoping review identified literature from 2006 to 2022 on social media use for HIV prevention among FSWs globally. The Theory of Planned Behavior (TPB) and the Technology Acceptance Model (TAM), both of which share the theoretical basis of the Theory of Reasoned Action (TRA), guided the review (Taylor & Todd,1995). Taylor and Todd developed this combined theory to achieve a better use of TPB in technology acceptance. This approach aimed to provide clarity on social media acceptance in HIV prevention for FSWs and assists in developing and improving social media-based HIV prevention interventions. The goal of this review was to better understand the current landscape of the literature and provide recommendations for future areas of research in digital health interventions utilized by FSWs.

Methods

In conducting this scoping review, we adhered to the methodological guidelines outlined by Arksey and O'Malley 2005: (1) identifying the research question; (2) identifying relevant studies (peer reviewed papers and published conference abstracts);

(3) selecting the studies; (4) charting the data; (5) collating, summarizing, and reporting the results; and (6) consultation (Dados & Connell, 2012).

This scoping review answered the overarching research question: "What is the landscape of social media use in HIV prevention education aimed at FSWs?" The study team conducting the review developed the search strategy, which was translated and executed in PubMed, Embase, Cochrane, Academic Search Premier, Global Index Medicus, and WorldWideScience.org (Table 1). We used the following selection criteria: (a) studies written or translated in English, (b) published between 2006 (when the Facebook platform became open globally for everyone over 13 with a valid email address) and 2022, (c) all study designs, and (d) focus on HIV/acquired immunodeficiency syndrome (AIDS) and use of social media among female sex workers (Boyd, 2019). There were no restrictions on sample size, population, location, or study design.

The first study extraction and analysis cycle was completed in March 2022 and focused on the Global South (which included all countries that are not the United States and in Europe). We performed a second updated search in December 2022 to cover all relevant literature globally and new literature published since the end of the first stage of the review. Both search cycles yielded a total of 451 publications.

Table 1

Search Terms

Database	Number of Publications	Search Terms
PubMed	4	(“Female sex worker” OR “prostitute”) AND (“HIV” OR “HIV prevention”) AND (“social media”)
Embase	26	('female sex worker'/exp OR 'female sex worker' OR 'prostitute'/exp OR 'prostitute') AND ('hiv'/exp OR 'hiv' OR 'hiv prevention'/exp OR 'hiv prevention') AND ('social media'/exp OR 'social media')
Cochrane	56	('female sex worker' OR 'prostitute') AND ('hiv' OR 'hiv prevention') AND ('social media') in All Text - (Word variations have been searched)
Academic Research Premier	36	('female sex worker' OR 'prostitute') AND ('hiv' OR 'hiv prevention') AND ('social media')
Worldwide Science.org	274	“Female sex worker” AND “HIV prevention” AND “social media”
Global Index Medicus	55	('female sex worker' OR 'prostitute') AND ('hiv' OR 'hiv prevention') AND ('social media')
Total	**451**	

Study Selection, Data Extraction, and Analysis

The first author scanned, identified, and excluded duplicate articles using Endnote (Clarivate, London). Article titles and abstracts were screened, and articles that did not focus on HIV, female sex workers, and social media were excluded. Third, we examined the full text of the remaining articles for compliance with selection criteria. Fourth, we categorized the existing literature into the following topic areas: (a) Female sex worker and HIV; (b) Female sex worker and social media; and (c) Female sex worker, HIV, and

social media. We included findings from abstracts submitted to HIV conferences to keep our search broad.

We extracted information on the study characteristics, sample population, and study findings. We tabulated information on the first author and year of publication, study location, study population, sample size, sampling strategy, study design, and key findings. In addition, we charted the data on FSW, HIV, and social media apps to organize our findings visually and to categorize our findings guided by aspects of TPB and TAM.

The C-TPB-TAM model has been utilized to explore users who are both experienced and inexperienced with a technology intervention (Samaradiwakara & Gunawardena, 2014). For this scoping review, the TAM and TPB theories informed the factors influencing social media's perceived usefulness and usage behaviors in HIV prevention interventions. The TPB predicts and explains health behaviors that depend on both intention and behavioral control (Boston University, 2022). Both TPB and TAM combine internal and external variables (beliefs, norms, usefulness, and perceptions) in each model to examine the social media in HIV prevention. We used these conceptualized and theoretical models to assist with revealing social media beliefs (favorable or unfavorable evaluation of social media use, motivation to use social media); norms (approval or disapproval of social media use, social media engagement, customary/normative social media use among FSWs); and controls (perception of ease to use social media) in HIV prevention.

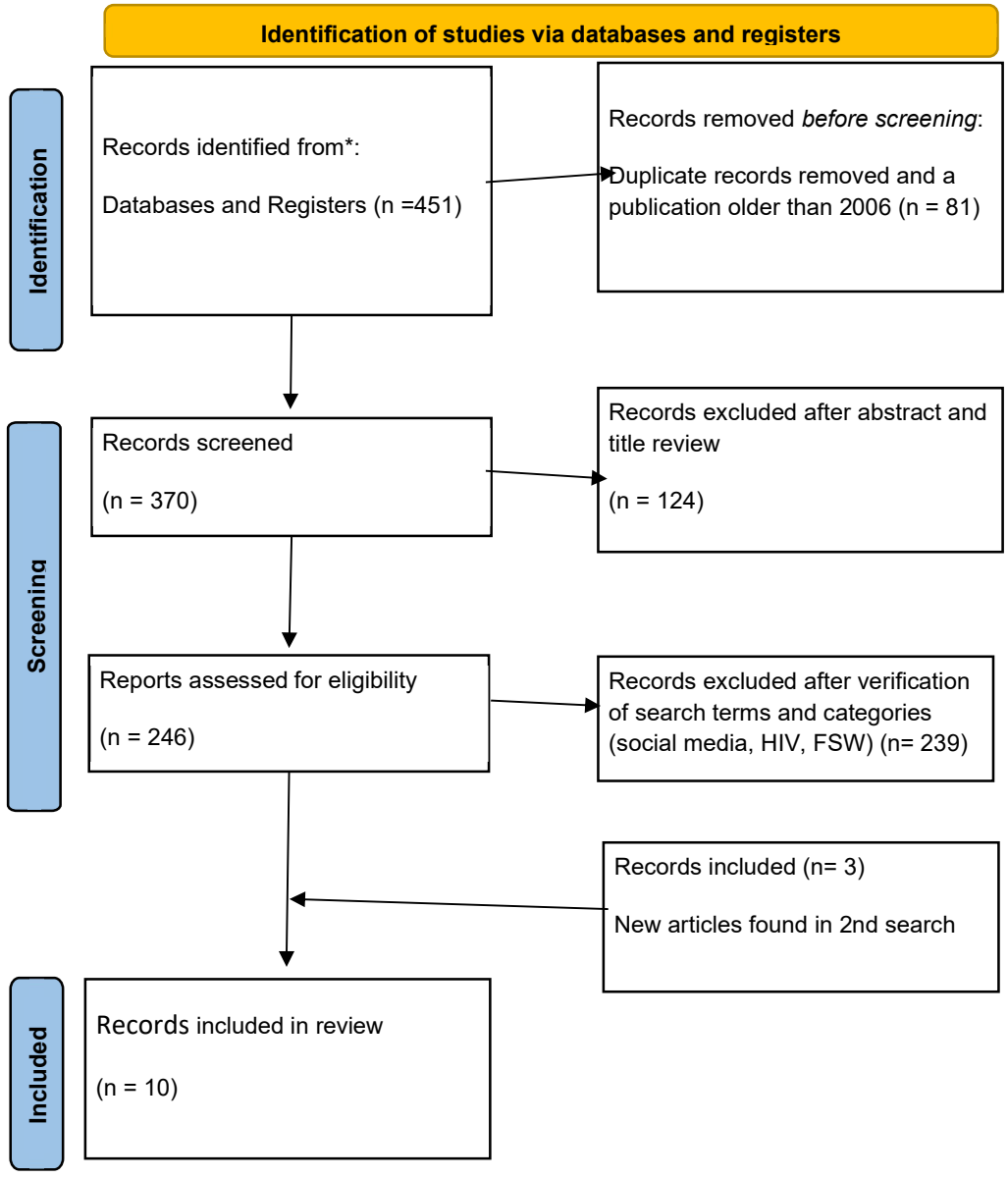
Results

Overview of Results

Both search cycles yielded a total of 451 results as shown in Figure 1. There were 81 duplicates removed, resulting in 370 articles subjected to title and abstract screen. Of those, 124 were excluded, leaving 246 articles for full-text review. Two hundred and thirty-nine articles were excluded after full-text review due to the topic area (e.g., focus did not include social media, HIV, female sex workers). The remaining articles were included in the analysis (see Figure 2). A total of 10 publications were selected from two search cycles. The first search resulted in seven publications. An additional three publications were extracted from the second search. In the updated search, we found three additional articles leading to a total of 10 articles.

Figure 1

Flow Diagram of Study Selection



The studies meeting our criteria included three abstracts (two conference abstracts and one poster abstract) and seven full text articles. The studies were conducted during a five-year span (December 2016 to July 2022) in six African countries - Kenya, Uganda, Tanzania, Nigeria, South Africa, and Cameroon; two Asian countries - Vietnam and

Indonesia, and one in the United States. Most of the studies were implemented in sub-Saharan Africa (70%). Seven research studies specified the type of social media platforms used, which included Facebook, Instagram, Twitter, Zalo, Jichunge, and WhatsApp. The sources of study results were from surveys, randomized clinical trials, interviews, and mapping (multistage capture and recapture studies). All randomized trials were conducted in Africa and Asia.

Social Media Norms and HIV Prevention among FSWs

The review of outcomes/measures was guided by the C-TAM-TPB model. The results revealed social media norms construct but lacked information about social media beliefs and controls in health prevention among female sex workers globally (Table 2). Social media norms among FSWs were defined by approval or disapproval of social media use, social media engagement, or customary/normative social media use. Social media norms identified in this review were related to location, time, and outreach.

Findings reported urban locations had infrastructure that can minimize power outages and provide reliable internet connectivity, but the access and use of the infrastructure may not utilize social media for HIV prevention. A study conducted in the highly populated city of Kampala, Uganda assessed the level and feasibility of use of information and communication technology and social media for research and HIV service delivery among young female sex workers. It found that the level of information and communication technology and social media access and use among young female sex workers was low for HIV prevention (Kasujja, 2021).

Eight of the 10 publications were conducted within the last three years, showing an increase of published literature and understanding of social media's role in HIV prevention over time. In Cameroon, an intervention using a Secret Facebook Group (SFG) platform was conducted from October 2020 to April 2021. The intervention was utilized to deliver 12 videos on HIV prevention in the local dialect to 60 FSWs. The study found the use of a social media HIV prevention tool improved PrEP awareness with good retention of knowledge six months after the intervention was conducted (Guillamet et al., 2021).

In Nigeria, social media was used to mobilize non-brothel-based female sex workers to learn about their knowledge of HIV self-testing and preference for HIV self-testing. A survey was conducted to ensure a high response of sex workers. There was not strong evidence in the literature that social media use was effective in recruitment of participants for this HIV prevention intervention or the other selected publications. Yet, studies showed social media improved awareness about interventions among FSWs and prioritized social media users. In Vietnam and Indonesia, research studies collected HIV information from FSWs who used social media as a tool of the trade to reach their clients. One of the Vietnam studies estimated the population size of the venue-based female sex workers (VFSWs) in Ho Chi Minh City. In this study, FSWs approached their clients using a social network platform (e.g., Facebook) or messaging apps (but did not have available methods for estimation of VFSWs) (Le et al., 2019). However, social media was not a part of the study's HIV prevention intervention.

Social Media Beliefs and Controls and HIV Prevention among FSWs

The literature suggested social media beliefs and controls' associations with HIV prevention among FSWs is largely unknown. Social media beliefs are the motivations to use social media. Social media controls are perceived ease of social media use in HIV prevention. Research found little to no information about favorability, perception, and motivation of social media use. HIV-related social media—driven interventions among FSWs was limited.

Table 2

Description and Analysis of Included Articles

Study	Dates Data Collected	Title of Article	Description of Study and Findings	Study Design	Setting/ Location	Type of Social Media
1	2020	River State, Nigeria's non-brothel-based sex workers prefer HIV self-testing out of concern for stigma, confidentiality and rejection	A survey was conducted using a personal interview approach to ensure a high response of sex workers from each sub-population. Social media was used to mobilize NBBFSW, in the context of COVID-19.	Conference Abstract	River State, Nigeria	Not specified
2	2020- 2021	Social Media Secret Facebook Groups for HIV Pre-Exposure Prophylaxis Awareness among Female Sex Workers in Cameroon	The intervention had a Secret Facebook Group (SFG) platform to evaluate the potential of a novel social media intervention to raise Pre-Exposure Prophylaxis (PrEP) awareness and complement HIV prevention strategies among FSW. It included 12 videos on HIV prevention in the local dialect, released over 8 weeks.	Poster Abstract	Bamenda & Mutengene Cameroon	Secret Facebook Group (SFG)
3	2016- 2017	Population Size Estimation of Venue-Based Female Sex Workers in Ho Chi Minh City, Vietnam: Capture-Recapture Exercise	A multistage capture-recapture exercise provided an estimated number of VFSWs in HCMC.	Multistage capture-recapture study	Ho Chi Minh City, Vietnam	FacebookZalo
4	2017- 2019	Information and communications technology use among young female sex workers participating in a randomized human immunodeficiency virus prevention trial in Kampala, Uganda	Randomized trial, the Zero Transmission (ZETRA) study, determine the level and feasibility of use of information and communication technology (ICT) and social media for research and service delivery among young female sex workers (YFSWs) in Kampala, Uganda.	Randomized trial	Kampala, Uganda	Facebook, WhatsApp

5	2020	Web-Based Multifaceted Approach for Community-Based HIV Self-Testing Among Female Sex Workers in Indonesia: Protocol for a Randomized Community Trial	A community -based randomized trial examining HIV self-testing in addition to the standard of care among FSW supported by a web-based data collection system. Multiple means of recruitment were deployed including through outreach workers and social media campaigns.	Community-based randomized trial	Indonesia	Facebook, Instagram, & Twitter
6	2020	Programming for female sex workers during COVID-19 pandemic: Experiences from Bar Hostess Empowerment and Support Program, Nairobi Kenya	The program adopted strategies including virtual meetings for HIV positive sex workers to improve adherence to HIV and multidrug dispensing of antiretroviral medications. Social media platforms are used to create awareness on HIV/STI prevention as well as COVID 19 information.	Descriptive Abstract	Nairobi, Kenya	Not specified
7	2020	Barriers and facilitators to retaining a cohort of street-based cisgender female sex workers recruited in Baltimore, Maryland, USA: results from the SAPPHIRE study	The study examined barriers and facilitators of retaining a street-based cohort of cisgender female sex workers recruited using mobile apps in Baltimore, Maryland who participated in the SAPPHIRE study. Participants completed interviews and sexual health testing at baseline, 3-, 6-, 9-, and 12-months.	Prospective longitudinal cohort study	Baltimore, MD, USA	Facebook and Instagram
8	2021	Population Size Estimation of Female Sex Workers in Hai Phong, Vietnam: Use of Three Source Capture–Recapture Method	A study was conducted in three districts in Hai Phong province, Vietnam to estimate the population size of the Female Sex Workers (FSW) in June–July 2019. Two techniques produced different PSE at both the district and the province levels. Additional studies are needed to estimate the number of sex workers who are not venue-based and use social media platforms to sell services.	Capture–Recapture Method: Mini-Respondent Driven Sampling (mRDS) Survey (third capture). Successive Sampling Population Size Estimates (SS-PSE)	Hai Phong, Vietnam	Not specified

9	2022	Predictors of mHealth use in promoting adherence to pre-exposure prophylaxis among female sex workers: an evaluation of the *Jichunge* intervention in Dar es Salaam, Tanzania	The study aimed at identifying the extent of and predictors for use of a smartphone based mHealth application among female sex workers in Dar es Salaam, Tanzania.	Quasi-experimental study	Dar es Salaam, Tanzania	Jichunge App, SMS, WhatsApp Facebook Instagram Twitter
10	2020	Facilitators and barriers to incorporating digital technologies into HIV care among cisgender female sex workers living with HIV in South Africa	This study explores potential facilitators and barriers to incorporating mobile phones and advanced technologies (e.g., biometric identification methods, mobile phone applications for social media and other uses, and chatbots) to deliver HIV-related interventions to cisgender FSW living with HIV in Durban, South Africa.	Qualitative study	Durban, South Africa	Facebook WhatsApp

Discussion

This paper presents information on determinants of social media use and behavior among FSWs in HIV prevention.

Location

The studies incorporating social media into HIV prevention or FSW populations that use social media for their work, were located primarily in sub-Saharan Africa and Southeast Asia. This finding suggested that location may be linked to the availability of resources (i.e., stable internet connectivity) that assist in accessing social media for HIV prevention. For example, being a FSW in urban areas of sub-Saharan Africa and Southeast Asia made it more likely that social media was being used to facilitate client recruitment or social media-driven HIV prevention.

The rapid rates of urbanization in sub-Saharan Africa and Southeast Asia along with the increased use of social media primarily through mobile phones, may create more opportunities for FSWs to access clients and HIV prevention resources. In addition, social media use among FSWs in urban settings may make it more convenient for FSWs to disguise their identities and maintain their privacy. This is still more aspirational because privacy is not always available (i.e., WhatsApp identifiers).

Social media was developing new spaces - i.e., Instagram and Facebook - for FSWs to participate in discussion and receive vital information related to HIV education and prevention. These social media platforms can provide safe spaces for FSWs online around pertinent topics and to critical health resources to make better health choices. The HIV prevention intervention in Cameroon used Secret Facebook Groups (SFGs) to create an environment for FSWs to engage with their peers and the 12 videos on HIV prevention without FSWs revealing their identities.

Time

Findings of this scoping review suggest that social media-driven HIV research and interventions among FSWs were increasingly being used. Data collection dates ranged from 2016 to 2021 with most of the research being collected in 2020 and published in 2021. With the increase of literature during the last two to three years, the potential of social media's impact will be better understood as more literature is published over time. In addition, leap frogging - adoption of a more advanced technology while skipping the preceding stage of technology - happened in sub-Saharan Africa and Southeast Asia (Fong, 2009). Leap frogging is made possible through the lower cost and

greater efficiency of cellular networks, and greater number of people owning a smartphone (Poushter, 2016).

Social media has the potential to provide populations, particularly vulnerable groups like FSWs, with HIV prevention and education information quickly that enables more effective and responsible health choices. Our review suggested increased flexibility of how FSWs receive HIV education and recruit clients that could improve the time necessary to make healthy decisions. In addition, the potential of social media's impact on HIV prevention among FSWs will be better understood as more literature is published and becomes available.

Outreach

The reviewed articles proposed social media is used for increasing awareness about HIV prevention among FSW. Some positive effects that have been attributed to the use of social media in HIV prevention were education and knowledge translation (Hamill et al., 2015). The studies revealed that social media might positively impact HIV and PreP knowledge and increase social support among FSWs. For example, the review study conducted in Cameroon assessed Social Media Secret Facebook Groups for HIV Pre-Exposure Prophylaxis Awareness among FSWs in Cameroon.

The use of a social media HIV prevention tool tailored to FSW in Cameroon improved PrEP awareness with good retention of knowledge for the intervention group, although not compared to control group. These findings are supported by findings from the SAPPHIRE study in Baltimore, MD. The study staff were permitted to send private messages for recruitment of participants using social media with SAPPHIRE Study

Facebook and *Instagram* accounts (Bradley et al., 2020). Social support models identify social support and increase shared experiences as pathways to improved health (Roberts,1997).

Gaps and Potential for Future Research

This scoping review identified several areas where there is a need for future research. Social media beliefs, attitudes, and controls (perception of ease to use social media) were not identified in the findings. Quality of information and the misinformation potential of social media were still concerns (Alexander, 2014). Most of the research literature highlighted social media norms (such as social media use and engagement), but additional research is still needed to determine engagement in HIV prevention education opportunities (Mbotwa, 2022). Future research will also assist in better understanding favorability and motivation to use social media, perceptions of ease of social media use in HIV prevention and impacts of social media on HIV health behaviors and outcomes. The literature also highlighted the limited number of social media based HIV prevention intervention targeting FSWs globally. Therefore, future research should also explore scalability of social media-based HIV prevention interventions. Advanced research should include studies to identify what social media platforms are being used, acceptance and preference of social media tools, and barriers to use of social media for HIV prevention.

Limitations

There are a few limitations to this scoping review. First, this review consisted of only 10 manuscripts, seven of which were research articles. This is a very small sample

size. This limitation is further evidence of the importance of adding literature in this area of research. Second, the exclusion of articles not published in English may have missed relevant papers published in different languages. Finally, there could still be valuable studies we failed to capture such as internal technical reports from government health agencies (Riveria et al., 2021).

Conclusions

In conclusion, this scoping review provides a landscape of literature on the use of social media in HIV prevention among FSWs. The findings from this review suggest a relatively young body of literature and a gradual increase in the number of research articles. Social media norms were identified and associated with location, time, and outreach. More research is needed in the following areas: Social media beliefs, attitudes, and controls; and quality of information of social media. Developing a deeper understanding of social media use in HIV prevention among FSWs is necessary to inform decisions and maximize the effectiveness of social media related to HIV prevention and health behavior. Effective approaches can be tailored for cultural competence, sustained community engagement and empowerment, and continued research for sex worker communities.

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PAPER 2: UNDERSTANDING FEMALE SEX WORKERS' ACCEPTANCE OF SECRET FACEBOOK GROUP FOR HIV PREVENTION IN CAMEROON

by

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Abstract

Introduction: Despite the widespread utilization of social media in HIV prevention interventions, there is little known about the acceptance of social media in the dissemination of HIV prevention information among key at-risk groups like female sex workers (FSWs). This study was conducted to investigate FSWs' acceptance of Secret Facebook Group (SFG) in learning about HIV prevention. **Methods:** During June 2022, a quantitative study was conducted using a 5-star point Likert scale survey among 40 FSWs aged 18 years and older who took part in a Secret Facebook Group (SFG) HIV intervention. Descriptive statistics were used to describe demographics, social media accessibility, perceived usefulness (PU), perceived ease of use (PEOU), and acceptance among survey participants using SPSS and SAS. **Results and Discussion:** Most study participants found SFG utilized in HIV prevention intervention acceptable. Seventy-five percent (75%) of participants selected 5 stars for the acceptance of SFG. The survey also revealed that the majority of participants used social media, spend more than 90 minutes on social media per day, and could participate in the SFG HIV prevention intervention if airtime was not provided, despite experiencing times when the internet was interrupted. The results also showed the PU and PEOU mean scores of SFG in the HIV prevention intervention were slightly lower than the acceptance scores (4.70 and 4.50 vs. 4.74). The data suggest future research should focus on explaining FSWs acceptance of social media and identify social media platform alternatives for HIV prevention intervention.

Conclusions: This study provides useful insights into social media acceptance, use, and importance in HIV prevention education among FSWs. The findings also indicate the need for further research on the reasons for acceptance of social media and relevant social media platforms supporting HIV prevention education among FSWs.

INTRODUCTION

In many sub-Saharan countries, including Cameroon, female sex workers (FSWs) have limited access to sexual and reproductive health interventions including HIV prevention education because sex work is illegal in those countries (Mayanja, Yunia et al. 2016) The criminalization of sex work hinders efforts to prevent HIV and other STIs among FSWs (Mayanja, Yunia et al., 2016). Globally, the use and awareness of pre-exposure prophylaxis (PrEP) have been proven effective in HIV prevention among FSWs (Ghadya et al., 2020). Individual-level interventions such as personal messages and behavior change tools can be modified for delivery via mobile devices. Mobile technologies are also found to be cost-effective (Donker et al., 2015), and have the potential to combat barriers to access prevention tools and improve outcomes (Lingg & Lütschg, 2019).

Secret Facebook Group (SFG) is a Facebook group that is not visible to anyone through Facebook searches or the outside world. Participants join the group only by an invitation from a Facebook friend who is also a member of the group. Increased social support through this kind of social media platform has improved access to HIV prevention services and builds a community with peers, which is a critical component in controlling the spread of HIV (Hovarth et al.,2020). Despite the widespread utilization of social media in HIV prevention interventions, there is very little known about the acceptance of social media in the dissemination of HIV prevention information among key at-risk groups like FSWs.

Acceptance of Social Media among Female Sex Workers in HIV Prevention Education

Acceptance reflects the thoughts and feelings of participants about the intervention's technology *after* engagement (Nadal et al., 2020; Sekhon et al., 2017; vanGemert-Pijnen et al., 2011). Acceptance is strongly related to beliefs about the effects of the technology, service, and tools after the intervention has been implemented or introduced to a group (Shuitema, 2010). To measure the influence of factors and construct a comprehensive model for acceptance of social media, the Technology Acceptance Model (TAM) was combined with the Theory of Planned Behavior (TPB) to build the theoretical foundation for this research (Taylor & Todd, 1995).

The combined Technology Acceptance Model and Theory of Planned Behavior (C-TAM-TPB) is used in many studies to explain the adoption of technology and has proven useful in studies regarding the acceptance of digital health interventions (Nkenke et al, 2012). The C-TAM-TPB postulates perceived usefulness (PU) and perceived ease of use (PEOU) to have direct and positive effects on behavioral intention as a valid predictor of acceptance (Agudo-Peregrina et al., 2014).

During the COVID-19 pandemic, there has been an increased use of digital health modalities, particularly social media (Hudak et al., 2021). Therefore, it seems timely to explore acceptance of social media in areas of health intervention. Earlier studies showed that acceptance of technology influences behavior and is affected by a variety of factors including individual differences, social and situational influences, user beliefs, user attitudes, and managerial intervention (Tilahun et al., 2021). Despite this, only limited research has been conducted on the use of social media in HIV prevention education

among FSWs. This study was conducted to investigate the level of acceptance of the use of a Secret Facebook Group in learning about HIV prevention by FSWs.

Methods

Study Design and Participants

During June 2022, 40 participants were recruited via phone and in-person at New Life Club, an organization providing resources to sex workers in Cameroon. The eligibility criteria for participation in the study were that FSWs had to be of adult age (18 years or older), be a member of NLC, participated in the SFG HIV prevention education intervention in 2021, had good command of the English language, and possessed a smartphone. All participants were told by NLC Coordinators about the length of time of the survey and gave written informed consent before they completed the survey, which took approximately 30 minutes. Participation was voluntary and participants could withdraw from the study at any time. Financial assistance was provided for roundtrip transportation to NLC and for smartphone airtime. No personal information was collected or stored.

The paper survey was administered by NLC coordinators. Prior to survey administration, NLC coordinators completed training related to interview skills, audiotaping, and storing data via Zoom and WhatsApp. The training sessions also incorporated a practice session with the first author to accurately convey the same meaning for each survey question to ensure fidelity in administration of the interviews during the practice session. The study was approved by the Cameroon Baptist

Convention Health Services Institutional Review Board (CBCHS IRB) and the University of Alabama at Birmingham Institutional Review Board.

Measures

The star rating questionnaire contained the following items: sociodemographic factors (i.e., age, education, date of birth, marital status, and children/offspring); health information (i.e., HIV status since the parent study and an assessment of awareness of HIV status, PrEP awareness); accessibility of social media (i.e., social media history and preferences); and acceptance of social media in HIV prevention (perceived usefulness, ease of usage, acceptance).

The star ratings survey can capture reactions to digital health interventions and factors that influence them (Perski & Short, 2021). Sociodemographic data were assessed using items on age, marital status, having children (aged < 18 years), educational level, and occupational status. Regarding HIV status, participants were asked whether they knew their status, what their status is, had they ever been tested for HIV, had they ever been told they have HIV, and were they aware of PrEP before the SFG HIV prevention education intervention. In terms of accessibility of social media, participants were asked about their ownership of smartphones, time spent on a smartphone, access to the internet via smartphone, social media usage, and family and friends' social media usage.

In addition, the questionnaire content was based on the Mobile Application Rating Scale (MARS), and the Technology Acceptance Model (STAM) Scale. MARS is a widely used tool to evaluate the quality of mobile health apps. STAM Scale is a usability scale to assess behavioral intention to use an intervention's technology. The survey's 5-

star scale ranged from “1 star for Strongly Disagree” to “5 stars for Strongly Agree”. Study participants provided their ratings of SFG by selecting a number of stars ranging from 1 to 5 for each question or statement. Each research measure (perceived usefulness, ease of usage, and acceptance) had associated questions or statements.

The Perceived Usefulness (PU) variable included 16 survey statements and the Perceived Ease of Usage (PEOU) variable had 10 survey statements. Acceptance was defined as behavioral intention to use SFG in HIV prevention education and five associated survey statements and questions. A mean score was calculated for each variable category. The overall SFG acceptance score was the mean of perceived usefulness, ease of usage, and acceptance indicators. An overall score of 4 stars or above was considered acceptance of SFG in the parent project.

Behavioral intention (acceptance), PU, PEOU items were supported by the C-TAM-TPB model (see Figure 1). Further details on our application of this framework to the survey can be found in Table 1.

Figure 1

Adapted C-TAM-TPB Model

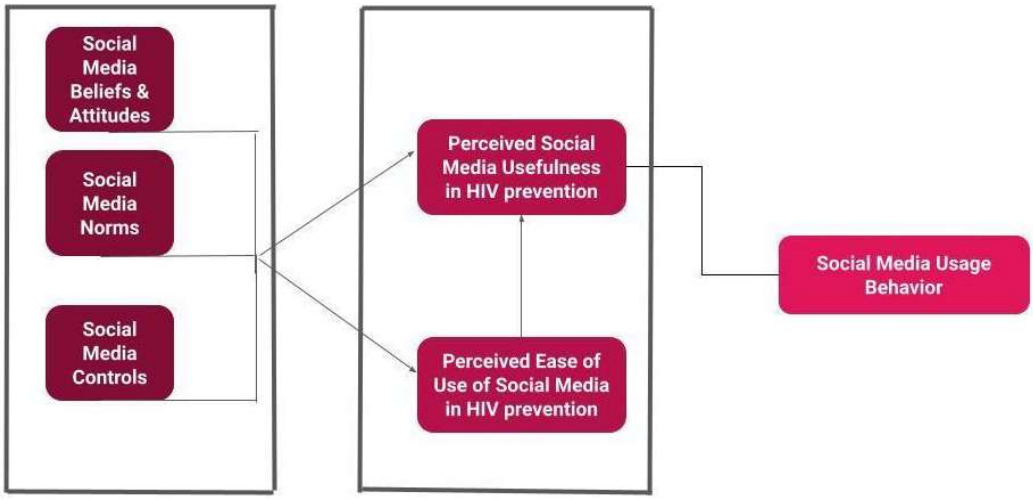

Table 1

Application of TPB/TAM Framework Constructs

Construct	Research Questions
Behavioral intention (Acceptance)	**Star Rating Questions** I believe the use of SFG in the NLC Project was a good idea. I was satisfied with the SFG used in the NLC Project. I will use SFG more to learn about HIV prevention strategies. I would recommend SFG to others who want to learn about HIV prevention strategies. What is your overall star rating of SFG?
Perceived usefulness (PU)	**Star Rating Questions** I find social media helpful to learn about HIV prevention and PrEP. I find SFG helpful during the NLC Project. I find it helpful to receive reminders of HIV prevention video releases in the SFG. I find social media helpful for me to educate others about HIV prevention. I find SFG useful in my HIV prevention activities. I am satisfied with HIV prevention education from SFG. I find my use of SFG in the NLC Project has increased my awareness and knowledge of PrEP and HIV prevention. I find using SFG would enhance my effectiveness in HIV prevention activities. I find my use of SFG in the NLC Project has changed my attitudes toward improving practices against HIV. I find my use of SFG SFG in the NLC Project has increased my intentions/motivation to practicing HIV preventive measures. I find my use of SFG in the NLC Project is likely to encourage me to further seek help for HIV testing, care, and treatment.
Perceived ease of use (PEOU)	**Star Rating Questions** I like the idea of using SFG. I could be skillful at using SFG. I find when I want or need to use SFG, it is accessible. I feel apprehensive about using SFG. I hesitate to use the SFG for fear of making mistakes I cannot correct. I find SFG interesting to use. I find that SFG allows user input, feedback, and prompts (reminders, sharing options, notifications, etc.)? I find SFG features (functions) and components (buttons/menus) to work fast. I find it easy to learn how to use SFG. I find SFG menu labels/icons and instructions clear. I would recommend SFG to others who want to learn about HIV prevention strategies. What is your overall star rating of SFG?

Statistical Analyses

Quantitative data from 40 survey respondents were entered and imported into SPSS 26 (IBM) and SAS for analysis. Descriptive statistics were calculated for demographic characteristics of participants using mean ± standard deviation for continuous variables and frequency (percentage) for categorical variables. Next, acceptance was computed, its distribution assessed, and respective frequencies calculated.

Results

Demographics

Forty participants, aged 22 to 56 years, completed the survey (Table 2, Appendix). On average, participants were 30.65±SD years; most were single (95%), had a secondary education or higher (70%), and had children (77.5%). The average number of years the women had been working as sex workers was 9.43±SD and 47.5% of the women who worked as full-time FSW.

HIV Status

HIV status and prevention awareness are displayed in Table 3. All participants had been tested for HIV, knew their HIV status, and were HIV negative. Most women were not aware of PrEP before SFG HIV prevention education intervention (87.2%).

Accessibility of Social Media

Accessibility of social media variables were also measured. All FSWs had access to the internet via smartphone, used social media, had access to social media via their

smartphone, used Facebook, felt comfortable conducting social media activities, and had family and friends who sued social media. The majority of participants (82.5%) did not share a smartphone with anyone, spent three or more hours per day using the internet via their smartphone (55%), experienced times of internet interruptions (70%), and bought airtime to use internet two or more times per week (60%). The majority of FSWs would participate in the SFG HIV prevention intervention if airtime was not provided (55%).

In addition, most FSWs reported they currently used social media (97.5%), used WhatsApp (87.5%), spent more than 90 minutes on social media per day (72.5%), watched videos on social media (97.5%), and texted or messaged with friends or clients (70%). Participants expressed feeling safe conducting social media activities (97.5%), believed that personal information was kept private (97.5%), preferred the social media apps Facebook (50%) and WhatsApp (47.5%), had immediate family members who preferred to use Facebook (82.5%), and had friends who preferred to use Facebook (90%).

PU Score

Table 4 displays FSWs' perceived usefulness (PU) of SFG in HIV prevention education. The mean PU score was 4.70 (SD = .49). Forty percent (40%) of participants reported a score of 5 for the PU of SFG.

PEOU Score

The mean PEOU score was 4.50 (SD = .59). Twenty percent (20%) of participants reported a score of 5 for the PEOU of SFG.

Acceptance Score

Three-quarters (75%) of participants reported an acceptance score of 5. The mean acceptance score was 4.74 (SD = .53).

Discussion

Results from the descriptive analysis showed the mean scores for FSWs' perceived usefulness, perceived ease of use, and acceptance of SFG in the HIV prevention intervention as 4.70, 4.50, and 4.74, respectively. The survey revealed that the majority of participants used social media, spent more than 90 minutes on social media per day, and could participate in the SFG HIV prevention intervention if airtime was not provided, despite experiencing times when the internet was interrupted. Poor connectivity and internet interruption were common in Cameroon, which negatively impacted access and use of social media.

In addition, participants and their family and friends preferred Facebook and WhatsApp to other social media applications because they felt safe sharing information and interacting with one another using these applications. Studies conducted to understand the perceived benefits of social media use reported that sex workers are safer and stronger because of social media (Ellis, 2018). FSWs can connect with their peers, family, and friends without explicitly identifying as a FSWs (Ellis, 2018). Not only do

the initial data reveal the acceptance of SFG, but they also provide a better understanding of the social media acceptance in HIV prevention education. The PU and PEOU mean scores of SFG in the HIV prevention intervention were slightly lower than the acceptance scores (4.70 and 4.50 vs. 4.74).

The perceptions of usefulness and ease of use of SFG did not negatively influence FSWs' perceptions of acceptance of SFG. Several factors could contribute to this situation. The majority of women had three or more living children and children who stayed with them, which may have influenced their acceptance of SFG. Since the youth population is the largest group to use social media, they could influence their parents' or guardians' acceptance of social media. In addition, prior awareness and use of social media by participants may have led them to rate acceptance of SFG high, despite its perceived usefulness and ease of use.

The slightly lower PU and PEOU may be attributed to unstable internet connectivity and lack of infrastructure in Northwest and Southwest Cameroon. These data also identify areas for future research to inform design of social media-based HIV prevention education interventions. Specifically, future work will focus on the reasons for FSWs acceptance of social media and social media platform alternatives for HIV prevention intervention.

Limitations

This study has limitations that must be considered in interpreting the results. First, the sample size was only 40 participants and surveys had a couple of missing responses to some variables. With such a small sample size, additional statistical analyses could not

be performed. Second, the study sample represented only FSWs who were recruited by NLC and participated in SFG HIV prevention intervention conducted in Western Cameroon a year prior to this survey. Therefore, the results may not be generalizable to FSWs who did not participate in the SFG HIV prevention intervention and FSWs in other areas of Cameroon. Additionally, the data were self-reported and may be subject to social desirability bias.

Conclusions

This study showed Secret Facebook Group was an acceptable tool in HIV prevention education for FSWs who participated in SFG based HIV prevention education intervention. The findings from the survey provided new information and insights into the factors, such as perceived usefulness and perceived ease of use, influencing the behavioral intention of participants to use social media. The FSWs rated SFG's usefulness, ease of use, and acceptance highly. These findings highlight the importance of social media HIV prevention education interventions among FSWs and other key populations.

Many participants had the ability to buy airtime that allowed them to share information via Facebook and WhatsApp with their family, friends, and clients. Though this sample size was very small, this study provided new information on the perceived usefulness, perceived ease of use and acceptability of SFG for HIV prevention. The study also indicates the need for further research on social media-based HIV prevention interventions targeting FSWs. In addition, findings can be used to inform, develop, and

improve appropriate interventions using relevant social media platforms to support HIV prevention learning among FSWs.

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APPENDIX

TABLES 2-4

Table 2

Demographic Data

Variables	(N=40, 100%)
DEMOGRAPHICS	
Age	
22-29	9 (47.4)
≥30	10 (52.6)
Years working as CSW	
2-5	2 (9.1)
≥5	20 (90.9)
Type of work	
No response	5 (22.7)
Part time	3 (13.6)
Full time	14 (63.6)
Children	
None	3 (13.6)
1	4 (18.2)
2	5 (22.7)
≥3	10 (45.5)
Living Children	
None	3 (13.6)
1	4 (18.2)
2	5 (22.7)
≥3	10 (45.5)
Children Stay with CSW	
None	2 (9.1)
1	2 (9.1)
2	3 (13.6)
≥3	15 (68.2)
Pregnancies	
None	2 (9.1)
1	3 (13.6)
2	4 (18.2)
≥3	13 (59.1)
Marital Status	
Single/Widowed	22 (100.0)
Married	0
Education Level	
Primary	8 (36.4)
Secondary	11 (50.0)
≥Secondary	3 (13.6)

Table 3

HIV Status and PrEP Awareness

HIV STATUS & PREP AWARENESS	N(%)
Tested for HIV	40 (100.0)
Knew their HIV status	40 (100.0)
HIV negative	40 (100.0)
Not told previously that they had HIV	38 (95.0)
Not aware of PrEP before SFG HIV prevention education intervention	35 (87.2)

Table 4

Accessibility and Use of Social Media

ACCESSIBILITY & USE OF SOCIAL MEDIA	N (%)
Time use internet via smartphone	40 (100.0)
Buy airtime to use internet	40 (100.0)
Participate in online intervention if airtime not provided	40 (100.0)
Length of time on social media per day 90 min ≤	29 (72.5)
Owned a smartphone	40 (100.0)
Access to the internet via smartphone	40 (100.0)
Used social media	40 (100.0)
Access to social media via their smartphone	40 (100.0)
Used Facebook	40 (100.0)
Comfortable conducting social media activities	40 (100.0)
Family and friends that use social media	40 (100.0)
Did not share a smartphone	33 (82.5)

3 or more hours per day using the internet via their smartphone	22 (55.0)
Internet interruptions	28 (70.0)
Bought airtime to use internet two or more times per week	24 (60.0)
Participate in the SFG HIV prevention intervention if airtime was not provided	22 (55.0)
Used social media	39 (97.5)
Used WhatsApp (87.5%)	35 (87.5)
Spent more than 90 minutes on social media per day	29 (72.5)
Watched videos on social media	39 (97.5)
Texted or message with friends or clients	28 (70.0)
Safe conducting social media activities	39 (97.5)
Believed personal information is kept private	39 (97.5)
Preferred the social media apps Facebook WhatsApp	 20 (50.0) 19 (47.5)
Immediate family who preferred to use Facebook (82.5%)	33 (82.5)
Friends who preferred to use Facebook (90%)	36 (90.0)
OUTCOMES	**Mean (SD)**
Perceived usefulness (PU)	4.70 (.5)
Perceived Ease of Use (PEOU)	4.50 (.6)
Acceptance	4.74 (.5)

PAPER 3: UNDERSTANDING ACCEPTANCE OF SOCIAL MEDIA IN HIV OF SOCIAL MEDIA IN HIV PREVENTION AMONG FEMALE SEX WORKERS IN CAMEROON

by

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Format adapted for dissertation

Abstract

Introduction: Approximately 24.3% of female sex workers (FSWs) in Cameroon are living with HIV. Social media platforms present new opportunities to improve HIV prevention efforts. The objective of this study was to explain the acceptance of Secret Facebook Group (SFG) in HIV prevention education among FSWs in Western Cameroon. **Methods:** A qualitative study, including semi-structured phone interviews using purposeful sampling, was conducted among 20 FSWs aged 18 years and older during June 2022. Interview questions focused on social media platforms used to learn, challenges and benefits of SFG in receiving HIV prevention education, and recommendations including alternatives to SFG for future interventions. Thematic analysis was conducted to analyze responses using NVivo. **Results and Discussion:** Five themes emerged from the phone interviews with FSWs: (1) social media platforms Facebook generally and WhatsApp were used by most FSWs to learn about HIV prevention; (2) HIV prevention knowledge acquired using SFG included preventative strategies and tools; (3) challenges of using SFG to learn about HIV prevention included poor connectivity and infrastructure, level of education, and financial support; (4) benefits of using SFG to learn about HIV prevention included HIV prevention information, peer-learning, and support from fellow FSWs and research team; and (5) recommendations for social media alternative, additional communication opportunities, and technical support.

Conclusions: This study provides useful insights into factors that influence the use of social media in HIV prevention education by FSWs. Participants accepted SFG-based HIV prevention intervention; however, better connectivity, education levels, and financing are needed. Findings can inform the development of social media-based health interventions and the different social media platforms that can be utilized in Cameroon and beyond.

INTRODUCTION

Approximately 40% of new HIV infections among adults in Cameroon are acquired by high-risk population groups (Ndenkeh et al., 2022). Female sex workers (FSWs) are a key population who are often difficult to engage in HIV prevention programs due to the stigma and criminalization of their work (Ma et al., 2017). Of the 112,580 women in Cameroon estimated to be engaged in sex work, approximately 24.3% are living with HIV (Bowring, 2019; UNAIDS, 2020)

Social media platforms, such as Facebook and Twitter, have been used in HIV prevention efforts to provide users the opportunity to share information anonymously worldwide (Tso et al., 2016). The current global average gender split of social media users is 54% men versus 46% women. In addition, sites like Facebook (63% males vs. 75% females) are more female orientated (Dean, 2021). The Joint United Nations Programme on HIV/AIDS shared that increased social support through social media improves access to HIV prevention services and builds a community with peers (Taggart, et al., 2015). This is a critical component in the effort to control the spread of HIV (Taggart, et al., 2015).

Platforms like Facebook and its Secret Facebook Group (SFG) feature can provide exclusive and safe communication for private groups. A SFG is a Facebook group that is not visible to anyone through Facebook searches or the outside world. Participants join the group only by an invitation from a Facebook friend who is also a member of the group. Despite the widespread utilization of social media in sub-Saharan

Africa (SSA), the acceptance of social media as an HIV prevention tool among FSW has not been well studied. A recent study's findings revealed that SFG is largely accepted as an HIV prevention education intervention but additional research is needed to better understand why.

This qualitative research study was conducted to explain FSWs' acceptance of Secret Facebook Group (SFG) in HIV prevention education and identify social media platform alternatives to SFG in Cameroon. Understanding FSWs' beliefs and use of social media are essential for the development and delivery of appropriate HIV prevention education. This study provided an opportunity for open discussion and richer context about social media use and platform alternatives, challenges and beliefs regarding SFG based HIV intervention, and recommendations by FSWs.

Methods

Study Design, Site, and Population

Semi-structured individual private interviews were conducted by trained study staff in June 2022 with FSWs in two provinces of Western Cameroon (Northwest and Southwest). Interviews were considered suitable to obtain sensitive information that participants may not want to discuss publicly (Nnko, 2020). Recruitment of FSW ≥ 18 years of age was led by coordinators employed at New Life Club (NLC), a non-governmental organization offering support services to FSWs in Northwest and Southwest provinces in Cameroon. Participants were recruited through purposeful sampling and a sample (N = 20 FSWs) was determined as sufficient for this study. An adequate sample size for qualitative study ranged between 20and 30 interviews, as

uniformity of information (saturation) usually is achieved (Creswell, 2019). All participants provided written and verbal informed consent prior to participation.

Participants

Participants were from a 2021 parent study that evaluated the potential of Secret Facebook Group (SFG) to serve as HIV prevention and PrEP roll out tool among FSW in Cameroon. In the parent study, participants in this study were FSWs and New Life Club (NLC) members - NLC is a commercial sex worker assistance program in Northwest and Southwest provinces, Cameroon. The inclusion criteria also included 18 years old and older, HIV negative, good command of English and Pidgin English, enough to interact in an online chat, and android phones owners. Participants were provided 2000 CFA (approximately 3.22 USD) for phone airtime to access the 12 SFG HIV prevention intervention videos.

This study shared the same inclusion criteria for participants as the parent study. In addition, study participants completed the pilot study SFG- based HIV intervention conducted by NLC, worked in Western Cameroon, or had shared their changed contact information. They were identified and recruited by trained NLC coordinators if they expressed interest to participate. Those who did not meet these criteria were excluded.

Development of Interview Guide and Data Collection

A semi-structured interview guide was prepared and included open-ended and probing questions. The interview guide was developed by a research team member based on a review of the literature and input from NLC coordinators who offer support services

to FSWs. Proposed questions were further discussed with a university professor who is an expert in qualitative research. Questions on the interview guide were developed in English and supported by the combined Technology Acceptance Model and Theory of Planned Behavior (C-TAM-TPB) model (Samaradiwakara & Gunawardena, 2014). The guide was reviewed by NLC coordinators to generate discussion on the use of social media to learn about different topics, challenges and benefits of using SFG to learn about HIV prevention, and recommendations. Additional probing questions and inquiry about alternative social media platforms are included (Table 1).

Table 1

Interview Guide Questions

Open-Ended Questions	Probing Questions
What social media platforms do you use when learning or discovering about different topics? Why?	1. How often are social media platforms available to you? 2. How did you make the decision to use the platforms you describe? 3. Would you use these platforms to learn about HIV prevention? If so, name those platforms.
What are the challenges of using SFG to learn about HIV prevention? Why?	1. Have you had any of these challenges during your participation in the SFG when learning about HIV prevention? 2. What challenges may prevent you from participating in future interventions with SFG or social media to learn about HIV prevention?
What are the benefits of using SFG to learn about HIV prevention? Why?	1. Have you had any of these benefits during your participation in the SFG when learning about HIV prevention? 2. What benefits may encourage you to participate in future interventions with SFG or social media to learn about HIV prevention?
If we were to conduct another study like this, what are your recommendations?	1. Do you prefer an in-person or virtual intervention?

The two NLC coordinators completed four training sessions related to interview skills, audiotaping, and storing data via Zoom and WhatsApp. Training sessions also incorporated a practice session with the first author and the NLC coordinators, who were proficient in both English and Pidgin English, to accurately convey the same meaning for each question in Pidgin English. The first author listened to NLC coordinators' oral Pidgin English translation of the interview questions and provided feedback to ensure fidelity in administration of the interviews during the practice session. After receiving

feedback, the NLC coordinators' practice Pidgin English translation of the interview question two times before the practice session concluded.

Twenty (20) individual interviews were conducted by phone with participants from two provinces in Western Cameroon. Participants who indicated they could participate in an individual phone interview session were contacted. Interviews were administered via phone call and written translated in Pidgin English by NLC coordinators in a vacant private room at NLC offices. Interviews lasted approximately 30 to 45 minutes and were audio-recorded.

Ethical Approval

This study was approved by the Institutional Review Board of the University of Alabama at Birmingham and Cameroon Baptist Convention Health Services Institutional Review Board Institutional Review Board.

Data Analysis

The interview audio-recordings were transcribed verbatim and translated from Pidgin English into English by a professional transcription and translation service company in Cameroon. The first author and another research team member also back-translated two of the interview transcripts from English to Pidgin English to ensure the accuracy of the transcripts. The data were coded using QSR International's NVivo 11.4.3 software using line-by-line coding of all responses to the interview guide questions. Analysis captured emerging themes about experiences of how FSWs gained knowledge about HIV prevention using SFG and social media platform alternatives from the

transcribed data. Themes were presented in a manner that conveyed participants' perceptions of the SFG base HIV intervention and identified alternative social media platforms.

Results

Twenty FSWs participated in individual phone interviews. All participants were single, HIV negative, owned a smartphone, and used social media. Most participants were 35 years or younger (80%), had been a FSW for six to 19 years (75%), had completed secondary school (55%), and did not share their smartphone (70%). Forty percent (40%, n=8/20) had three or more children.

Table 2

Characteristics of Study Participants

Participant Demographics	N=20	%
Age		
≤ 25	8	40
26-35	8	40
36-44	3	15
≥ 45	1	5
Years as FSW		
0-5	4	20
6-10	9	45

11-19	6	30
≥20	1	5
Education		
Primary	3	15
Secondary	11	55
Tertiary	5	25
Technical/Vocational	1	5
Marital Status		
Single	20	100
Married		
Cohabitating		
Divorced/Widowed		
Children		
0	5	25
1	4	20
2	3	15
3+	8	40
Share Smartphone		
No	14	70

Yes	6	30
Social Media Use		
No		
Yes	20	100

Five themes emerged from phone interviews (see Table 3), which revealed the views and beliefs of participants regarding SFG use and alternative social media platforms for HIV prevention education. Themes included: (1) social media used to learn about HIV prevention, (2) HIV prevention knowledge acquired using SFG, both (3) challenges and (4) benefits of SFG to learn about HIV, and (5) recommendations to improve implementation and future scaling of the intervention. A detailed table of themes and associated sub-themes, select codes, and illustrative quotes is provided in the appendix.

Theme 1: Social Media Used to Learn about HIV Prevention

With regard to the use of social media for HIV prevention education, participants were asked about social media platforms they used when learning or investigating different topics. Most participants indicated that their preferred social media platforms were Facebook and WhatsApp. Participants preferred to use Facebook and WhatsApp because they were easy to use and were able to connect and communicate with family and friends.

I use Facebook and WhatsApp…I choose these two social media platforms because I find them easy to use. - (Participant N0 B86017004)

Some participants expressed they also used Facebook and WhatsApp voice messaging to communicate with people who are unable to read or find reading challenging.

I use Facebook to communicate with friends and to do so many other things. I equally use WhatsApp to send voice messages when discussing. - (Participant No K95036151)

Other platforms used were Google, Instagram, Pinterest, TikTok, and YouTube. A participant expressed their personal experience:

When learning or trying to discover different topics, I use WhatsApp, I use Google because google is very good for research and any type of thing you want to research you can go on google and get it. So, I do use google. Also, I use Tiktok, just for fun and I use Facebook.

I think these are the platforms I am more regular with. (Participant N0 F99007510)

Theme 2: HIV Prevention Knowledge Acquired Using SFG

Participants were asked if they used these platforms to learn about HIV prevention. Most participants conveyed that they did use social media platforms and shared HIV content they learned. There were three reported strategies: (1) general HIV preventive methods, (2) limiting the number of sex partners, and (3) not sharing needles.

There were indications that social media helped to inform participants about regular HIV testing.

> *I learned about how to take care of myself, and prevent HIV, I can also encourage or educate others on how to prevent themselves from HIV. — (Participant N0 P98000015)*

Participants also acquired information about safe sexual behavior.

> *I learnt a lot about HIV prevention, sexually and in my community. I learn how to prevent the virus and I'm able to help someone from the knowledge I have gathered. Also, I learn[ed] how to use a condom. - (Participant N0 N99011289)*

> FSWs believed they learned how to refrain from sharing razors and needles especially without knowing other's HIV status.

> *…again with secret Facebook, you get to know the causes of HIV and ways of preventing it like the use of condoms…blades, avoiding unproductive [unprotected] sex, and constantly doing our checkup to know our status (Participant N0 S93010805)*

In addition, participants expressed that they learned about helpful HIV prevention tools and devices through social media. Some participants reported the tools and devices to prevent HIV were condoms and pre-exposure prophylaxis (PrEP).

> *…members get to learn a lot such as information about prophylaxis drugs. — (Participant N0 093004636)*

Theme 3: Challenges of Using SFG to Learn about HIV Prevention

When participants were asked about the challenges of using SFG to learn about HIV prevention, most responded that the lack of infrastructure, education, and fiscal support were obstacles. Many expressed that connectivity, gadgets, and data were infrastructure challenges. Poor connectivity prevented participants from viewing and downloading videos from the pilot intervention. The women expressed that sufficient data were not provided.

> *We have poor network and data. Even though efforts have been made to provide us with data, at times it is not enough to help us view the videos uploaded since videos are heavy and consume a lot of data.— (Participant N0 S93010805)*

Participants wanted appropriate gadgets made accessible.

> *Another challenge is the kind of phones we use. Some of our phones are not good at capturing the network easily. - (Participant N0 N97005656 9)*

Participants expressed that level of education was another challenge. Some participants discussed that literacy levels and lack of awareness of the HIV prevention pilot intervention were factors in SFG usage. Most participants understood the video provided in the SFG posts but some could not comprehend the written messages or respond in words. For instance, one participant responded:

> *I feel uneasy writing continuously. So just recording my voice and sending it makes it very easy for me. — (Participant N0 F99007510)*
>
> .

Participants reported more fiscal support was needed. Many of the women wanted financial assistance to purchase more data for their phones to view videos about HIV prevention.

> *For the situation of our country Cameroon, the cost of data connection is expensive and it becomes difficult to constantly download and watch the videos sent. —(Participant No K95036151)*

Theme 4: Benefits of Using SFG to Learn about HIV Prevention

When participants were asked about the benefits of using SFG to learn about HIV prevention, most reported obtaining HIV prevention information, peer-learning, and support from peers and the research team. Many expressed that the content shared in the videos was easy to comprehend.

> *…eases learning and the understanding of the information provided. (Participant No N9700321)*

The HIV information gained using the SFG included causes of HIV, prevention methods like condom use and avoiding unsterilized needles and blades, knowledge of one's status, and avoiding unprotected sex. One participant responsed:

> *…you get to know the causes of HIV and ways of preventing it like the use of condoms, avoiding unsterilized items like needles blades….- (Participant N0 S93010805)*

Additional benefits were peer sharing and support from peers and the research team. Many participants discussed how they can share information with other participants using SFG.

> *I was able to communicate freely, watch videos and participate in discussions even when I cannot afford it. This made me happy. - (Participant No K95036151)*

The support FSWs received from their fellow participants and the research team included money to buy data and privacy compared to the other social media platforms. With more data and privacy, some participants were motivated to share their challenges and experiences with their peers.

> *The privacy also was comfortable; we talk[ed] with confidence and with no fear since whatever we say cannot be traced to us as we didn't use our real identities. —(Participant N0 P98000015)*

Theme 5: Recommendations

All participants were asked about recommendations they would like to see in a similar intervention. Participants shared four main recommendations. The first recommendation was alternative social media platforms other than Secret Facebook Group to learn about HIV and other topics. Overall, most participants recommended WhatsApp as the top alternative social media platform.

If they can also change the means of lecturing us not only on Facebook but also by using other social media platforms to lecture us such as creating WhatsApp Group.— (Participant N0 A890212779)

Additional information participants would like future intervention to address included the following:

[o]ther topics of illnesses would also be very important though we know that our main area of study is HIV, we need other topics or lessons because we wish to know about other illnesses and even other sexually transmitted diseases - (Participant N0 A94010602)

The majority of participants reported the third recommendation as the need to have better communication with study researchers so that connectivity for social media can be effectively accessed for participation.

I will recommend that they should send the videos ahead of time so that we will be able to charge our phones, and search for airtime credit to login on time to watch the videos. — (Participant No N9700321)

Finally, additional technical support was also recommended. Participants wanted better phones, financing, data, and support of technical requests. Some participants wanted phones that allowed for clear video quality and more financial support to purchase airtime. One participant conveyed:

They should also try to finance the participants' phones so that they can always connect online.—(Participant N0 A94010602)

Discussion

This qualitative study demonstrated that FSWs who participated in the SFG based HIV prevention intervention had readily accepted the use of social media in HIV prevention education for a few reasons. Responses from our phone interviews provided a better understanding of the types of social media used, HIV knowledge gained, and challenges and benefits of using SFG for HIV prevention education. Responses shed light on preferred alternative social media platforms, particularly WhatsApp, in addition to SFG. Additionally, this study identified possible targets to focus on for future social media-based HIV prevention interventions for FSWs in Cameroon.

First, participants' predominant use of Facebook and WhatsApp highlighted a need to utilize platforms familiar to participants to better engage with FSWs in Northwest and Southwest Provinces in Cameroon. Participants preferred to use Facebook and WhatsApp because they were easy to use and were able to communicate and connect with family and friends. WhatsApp has 2 billion users worldwide, due in part to the company being acquired by Facebook's parent company, Meta in 2014. The acquisition provided inroads for Facebook in underserved communities of developing markets. WhatsApp uses a low data usage model that allows for affordable and easy communication because it does not use telecoms networks that traditionally support mobile phone text messaging (Magee, 2021).

Second, varying levels of reading comprehension, privacy, and peer learning indicated the importance of valuable HIV information presented via familiar tools used by FSWs. Studies from a systematic review conducted to understand the use of social media in HIV communication stated pre-existing platforms may decrease barriers associated with end-users learning and users' familiarity with platforms may facilitate more open communication (Taggart, 2015). Though participating FSWs had good understanding of English and Pidgin English, some could not read English or Pidgin English well.

The videos accessible through SFG addressed the varying literacy levels to receive critical HIV information. Some participants expressed they also used Facebook and WhatsApp voice messaging to communicate with people who were unable or found reading challenging. Therefore, participants communicated on social media with their peers and others using modes beyond written words.

Lastly, participants overwhelmingly recommended WhatsApp and stronger internet connectivity for future social media-based HIV prevention intervention. Cameroon struggles with inconsistent internet connection and power outages. In addition, WhatsApp is widely used in Cameroon and messages can be sent despite poor connectivity, which includes unstable Wifi and internet connection. A recent study conducted to understand WhatsApp influence on Cameroon's communication, reported that WhatsApp revolutionized how Cameroonians interacted with each other (Kala et al., 2022). The majority of the 161 participants in Cameroon were satisfied with WhatsApp services and use that were impacted by many factors including their intention to use WhatsApp, perceived usefulness (PU), and perceived ease of use (PEOU). Therefore,

initiatives among FSWs in Cameroon should account for the infrastructure limitations and popular tools to create effective social media-based HIV prevention initiatives.

This study has noteworthy limitations that should be considered in interpreting the results. First, the convenience sampling method used is prone to representation bias. Some participants may have declined to participate in the study due to fear that their statements could be used publicly. Secondly, all interviews were conducted with FSWs who participated in the SFG based HIV intervention and were members of NLC. Their feedback may not reflect FSWs who were not a part of NLC or who did not take part in the SFG HIV intervention.

Therefore, the results may not be generalizable to FSWs across Western Cameroon and in other regions of Cameroon. Lastly, interviews were conducted one year after the pilot intervention was conducted, which may introduce recall bias. Despite these limitations, this study provides valuable information regarding challenges and benefits of social media in HIV prevention education for FSWs. In addition, this study adds to the new and limited body of literature in this research area. Further research can help to inform design of social media-based HIV prevention education interventions for FSWs, especially in sub-Saharan Africa.

Conclusions

Overall, this study showed FSWs accepted SFG to acquire and learn HIV prevention education. Themes from phone interviews provided new information and useful recommendations regarding the use of social media in HIV prevention education. Participants expressed the belief that SFG was an acceptable social media platform

because they were able to maintain their privacy and learn HIV prevention strategies. Study findings also highlighted Facebook and WhatsApp as the preferred social media platforms to use. Though many participants acknowledged the challenges and limitations of the SFG, the aforementioned recommendations made by study participants can be used to develop future successful HIV prevention interventions that target FSWs in Northwest and Southwest Provinces of Cameroon and beyond.

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APPENDIX

DETAILED THEMES FROM QUALITATIVE ANALYSIS

Table 2a

Detailed Themes from Qualitative Analysis

Themes	Sub-themes	Select Codes	Illustrative Quotes
Social Media Used to Learn about HIV Prevention	• Social Media Platforms	• Social Media used to learn HIV Prevention ○ Facebook ○ Google ○ Instagram ○ Pinterest ○ TikTok ○ Whatsapp ○ YouTube	• *I use Facebook on daily bases, more than other platforms.*
	• Reasons by social media platform	• Reasons used to learn HIV Prevention ○ Facebook ○ Google ○ Instagram ○ Pinterest ○ TikTok ○ Whatsapp ○ YouTube	• *On WhatsApp, I get to communicate with family and friends, I can also communicate with people who can't read or write through voice messages on this platform.*
HIV Prevention Knowledge Acquired Using SFG	• Strategies	• Strategies ○ General preventive methods	• *I learned that I can get an HIV test after every two months*
		○ Limiting number of partners	• *I equally learned about not getting in contact with people whether negative/positive.*
		○ No sharing	• *... avoid using already used objects like razor blades and needles because it is*

	• Tools/Devices	• Tools/Device
		  • Condoms
		  • PrEP
			difficult to know the state of the person who used it earlier…
			
			• *I equally learned that I can prevent HIV by using condoms and pre-exposure prophylaxis.*

Challenges of using SFG to learn about HIV Prevention	• Infrastructure
	
	• Level of Education
		• Infrastructure
		  ○ Connectivity
		  ○ Data
		  ○ Gadgets
		
		• Level of Education
		  ○ Literacy
		  ○ Awareness
			• *… when I am about to download and watch videos sent to me I find it difficult due to the poor network situation.*
			
			• *The data provided to us were insufficient to enable us to watch the videos sent to us.*
			
			• *If some smartphones could be made available at our disposal with a better capacity to be used to watch videos without hitches, then it will be appreciated.*
			
			• *… we cannot read*

	• Fiscal Support	• Fiscal Support ○ Finances	*what is been sent to us and it makes it very difficult.* • *… I cannot equally afford internet data to login online.*

Benefits of using SFG to learn about HIV Prevention	• HIV Prevention information	• HIV Prevention
		  ○ Prevention Education
		  ○ Ease of Content Comprehension
			• *gain with secret Facebook, you get to know the causes of HIV and ways of preventing it like the use of condoms, avoiding unsterilized items like needles blades, avoiding unproductive sex, and constantly doing our checkup to Know our status.*
			• *I prefer Facebook because ….is useful and easy to learn*

	• Peer-Learning	• Peer-Learning ○ Share info with others	• *Also, I met new people from different countries; I got to learn from them and made new friends.*
	• Support from peers & research team	• Support ○ Compensation	

		○ Free Data ○ Privacy	● *When we continue to receive financial assistance from the group's Administration we are happy and motivated* ● *benefit I experienced ... the fact that free data was provided for me to learn.* ● *Another vital benefit is that we have experience privacy as compared to the other social media platforms... The secret Facebook platform ensures your privacy which makes members to be motivated to speak out what are their challenges and share their experiences...*
Recommendations	● Alternative Social Media Platforms	● Alternative Social Media Platforms ○ Social Media Alternatives	● *I will prefer that other means of social media like WhatsApp be used.*

	• Additional Information
	• Increased Communication Opportunities
	• Technical Support
		• Additional Information
		  ○ More Learning Domains
		• Increased Communication Opportunities
		  ○ Better Communications
		  ○ Better Connectivity
		• Tech Support
		  ○ Better Gadgets
		  ○ Finance
			•
			•
			• *they should include other illnesses like cancer etc. because HIV is not the only stigmatizing illness that exists.*
			•
			•
			•
			• *WhatsApp platform it will be great. It will enable us to be able to communicate effectively, given that even the illiterate ones will be able to communicate.*
			•
			• *poor connection or no data to connect. if we can have… better the network, we would be so happy because the connection is so poor*
			•
			•
			• *I will recommend the provision of other better gadgets that will ease participation in the program.*
			•

		○ More Data ○ Support	• *Also, the problem of finance often, you may want to login to the platform but you are limited because of lack of money to buy internet data.* • • *I will recommend the provision of more data to enable me login and access all the information provided.* • • *Furthermore, create WhatsApp groups to enable those who can read or write to participate in the discussions by sending voice messages expressing their experiences and ideas*

SUMMARY

Overall Findings

In seeking to understand FSWs' acceptance of social media in HIV prevention education, the results of this dissertation project achieved the three aims outlined in the introduction.

Aim 1: Provide a review of literature on the use of social media in HIV prevention education among female sex workers (FSWs).

From March to December 2022, a scoping review of literature was conducted to explore the use of social media among FSWs globally. The majority of literature was excluded, and there were only 10 articles that met our search criteria. All of the studies included were located in sub-Saharan Africa and Southeast Asia. In addition, findings of the scoping review illustrated the use of social media in HIV prevention interventions among FSWs had increased. Social media provides populations with increased awareness of and quick HIV prevention education that leads to more optimal health choices. Furthermore, the findings expressed the importance of future research in this area of study. The findings demonstrated that quality of information should be explored and additional research still is needed.

Aim 2: Determine the acceptance of Secret Facebook Group (SFG) for HIV prevention education among FSW in Cameroon.

In June 2022, a 5-star Likert scale survey was conducted with 40 FSWs who participated in the parent study's SFG HIV prevention education intervention in 2021. Respondents revealed that social media was an acceptable tool in HIV prevention education for some Cameroonian FSWs. The FSWs highly rated SFG's usefulness, ease of use, and acceptance. Many participants expressed feeling safe using and sharing information via Facebook and WhatsApp with others. Findings can be used to inform, develop, and improve appropriate interventions using relevant social media platforms to support HIV prevention education among FSWs.

Aim 3: Identify factors influencing FSWs' use of Secret Facebook Group (SFG) in HIV prevention education and social media platform alternatives to SFG in Cameroon.

In June 2022, semi-structured phone interviews were conducted with 20 FSWs who participated in the 5-star Likert scale survey, also held in 2022. Five themes emerged: types of social media used, HIV knowledge gained, and challenges and benefits of using SFG for HIV prevention education. Information from phone interviews provided new valuable recommendations regarding use of social media in HIV prevention education. The themes shed light on why some participants preferred WhatsApp, in addition to SFG. Additionally, this study identified that SFG maintained participants' privacy, additional HIV prevention strategies, and Facebook and WhatsApp as the preferred social media platforms to use. The findings can be used to inform,

develop, and improve appropriate interventions using relevant social media platforms to support HIV prevention education among FSWs.

Strengths and Limitations

The results from this dissertation should be considered within the context of a few limitations. Results may not be generalizable to FSWs across Western Cameroon and representation bias may have been present because the research was conducted only with FSWs who participated in the SFG based HIV intervention and members of NLC. Additionally, the sample sizes of the scoping review and mixed methods study were small, which made analyses challenging to perform. Responses to survey and interviews were self-reported and conducted one year after the pilot intervention happened, which may have introduced recall bias and social desirability bias. Finally, the scoping review only considered English publications that may have led to the exclusion of several foreign-language articles.

Despite these limitations, this study has several strengths. The study provides valuable information regarding the landscape of literature in this area of study, acceptance of social media in HIV prevention education, challenges and benefits of social media in HIV prevention education for FSWs, and different social media platforms. In addition, this study adds to the young body of literature in this research area. Further research can help to inform design of social media-based HIV prevention education interventions for FSWs, especially in sub-Saharan Africa.

The sequential explanatory mixed methods design was used for this dissertation (Creswell, 2002; Creswell et al., 1996; Green & Caracelli, 1997; Moghaddam et al., 2003). The strengths of this design for the research include the following:

1. Easy to implement by a research team in multiple locations. The research team was based in the United States and Cameroon. The research team was able to coordinate and communicate via email, WhatsApp, and Google documents because the dissertation research sequentially proceeded from one stage to another. The stages of sequential explanatory mixed methods design minimized any confusion that could arise from exchanges between research team members.
2. Useful for exploring quantitative results in more detail. The quantitative research's (paper #2) results informed the interview questions in the qualitative research (paper #3). The qualitative research provided better comprehension on why participants accepted SFG in HIV prevention intervention through understanding the benefits and challenges of the SFG in HIV prevention intervention and recommendations to improve future SFG and social media-based HIV prevention interventions.

The limitations of the sequential explanatory mixed methods design for the dissertation research include the following:

1. Requires feasibility of resources to collect and analyze both types of data. For this dissertation research, data were collected by the Cameroonian based research team but analyzed by the research team based in the United States. Translation and transcription services were completed in

Cameroon. SPSS, SAS, and NVivo were utilized to analyze both quantitative and qualitative data. This took time and funding to coordinate.

Research Implications

The results of our studies have several implications related to FSWs' acceptance of social media in HIV prevention education. First, videos accessible through SFG allows for anyone regardless of literacy level to receive critical HIV information. Therefore, the use of social media allows participants to not disclose their literacy levels; rather, participants can communicate with one another using emojis and likes instead of words.

Additionally, WhatsApp was the most recommended social media platform alternative to SFG. Many participants preferred WhatsApp because it is widely used in Cameroon and messages can be sent regardless of connectivity. This was especially important because Cameroon struggles with inconsistent internet connection and power outages, highlighting the need for more robust communication infrastructure and methods to share health information. Therefore, future social media-based HIV prevention interventions targeting FSWs should incorporate infrastructure limitations and popular tools for acceptance of the intervention.

Mixed Methods Integration

In a future paper, I would like to depict the entire sequential mixed method study, and this paper will be one of the first mixed methods studies about FSWs' acceptance of social media in HIV prevention education in SSA. The scoping review of the literature indicated that the use of social media was increasingly used as a method to deliver HIV

prevention education to FSWs. This modality was then proven to be acceptable to FSWs who participated in SFG HIV prevention intervention and responded to the survey (the quantitative part of the mixed methods design). The survey found that ratings of acceptance, PU, and PEOU were 4.5 and above out of 5 across the board, which indicates particularly high acceptance, perceived usefulness, and ease of use of SFG in HIV prevention education intervention. The qualitative interviews that followed explained and identified several reasons for the high ratings and acceptance of SFG in HIV prevention education intervention.

The integration of the quantitative and qualitative phases was conducted during the interpretation phase. This phase described the extent to which the qualitative and quantitative findings were consistent. To integrate the quantitative and qualitative findings, a joint display table was developed to facilitate a comparison of quantitative and qualitative results and inferences (see Table 1). The integration discussed how the research findings and theoretical constructs determined or facilitated acceptance of social media in HIV prevention among FSWs in Western Cameroon.

Table 1 is a joint display of the mixed methods integration. The first column outlines results from the quantitative strand of the study, the second outlines the results from the qualitative strand, and the third provides interpretation.

Table 1

Mixed Methods Study Joint Display Table

Quantitative	Qualitative	Interpretation
FSWs reported that they perceived SFG to be useful and easy to use and they accepted it as a method to deliver HIV prevention education (Mean [SD], range 0–5): • Perceived Usefulness (PU) – 4.70 (0.49) • Perceived Ease of Use (PEOU) –4.50 (.059) • Acceptance – 4.74 (0.53)	<u>Social Media Used to Learn about HIV Prevention:</u> What social media platforms do you use when learning or discovering about different topics? Why? • Social Media Platforms: *"I use Facebook on daily bases, more than other platforms."* • Reasons by social media platform: *"On WhatsApp, I get to communicate with family and friends, I can also communicate with people who can't read or write through voice messages on this platform."*	The quantitative and qualitative data imply that there is concordance across datasets. FSWs showed their acceptance of SFG by rating PU and PEOU of SFG, constructs of the TAM-TPB theoretical model guiding the dissertation research, which were based on how common social media platforms were, the HIV knowledge acquired, and benefits and challenges of SFG. The high ratings of PU, PEOU, and acceptance of SFG demonstrated FSWs' overall belief that SFG is acceptable with their existing social norms that include the use of Facebook, WhatsApp, and communicating with family and friends.
	<u>HIV Prevention Knowledge Acquired Using SFG:</u> Would you use these platforms to learn about HIV prevention? If so, what did you learn? • Strategies: *"I learned that I can get an HIV test after every two months."* • Tools/Devices: *"I equally learned that I can prevent HIV by using condoms and pre-exposure prophylaxis."*	Many FSWs accepted SFG because of the valuable information they received including information about HIV testing, condoms, and PrEP.
	<u>Challenges of using SFG to learn about HIV Prevention:</u> What are the challenges of using SFG to learn about HIV prevention? • Infrastructure: *"…when I am about to download and watch videos sent to me I find it difficult due to the poor network situation."* • Level of Education: *"…we cannot read what is been sent to us and it makes it very difficult."* • Fiscal support: *"…I cannot equally afford internet data to login online."*	FSWs shared obstacles to accepting SFG. FSWs experienced poor connectivity to the internet and insufficient funds to purchase data required to view content shared in the SFG. Being able to view the videos is important to the FSWs who have difficulty with reading English and Pidgin English. The challenges with SFG may have influenced the PU and PEOU ratings, for which the means are slightly lower than acceptance ratings.
	<u>Benefits of using SFG to learn about HIV Prevention:</u> What are the challenges of using SFG to learn about HIV prevention? Why? • HIV prevention information: *"Gain with secret Facebook, you get to know the causes of HIV and ways of preventing it like the use of condoms, avoiding unsterilized items like needles blades, avoiding unproductive sex, and constantly doing our checkup to know our status."*	Many FSWs accepted SFG because of the valuable information they received including information about HIV testing, condoms, and PrEP. Others appreciated the opportunity to interact with family and friends (new and old) privately.

Quantitative	Qualitative	Interpretation
	• Peer-learning: *"Also, I met new people from different countries; I got to learn from them and made new friends."* • Support from peers & research team: *"Another vital benefit is that we have experience privacy as compared to the other social media platforms…The secret Facebook platform ensures your privacy which makes members to be motivated to speak out what are their challenges and share their experiences…"*	
	<u>Recommendations:</u> If we were to conduct another study like this, what are your recommendations? • Alternative social media platforms: *"I will prefer that other means of social media like WhatsApp be used."* • Additional information: *"They should include other illnesses like cancer etc. because HIV is not the only stigmatizing illness that exists."* • Increased communication opportunities*: "Poor connection or no data to connect. if we can have…better the network, we would be so happy because the connection is so poor."* • Technical support: *"I will recommend the provision of more data to enable me login and access all the information provided."*	Recommendations mentioned by the FSWs were related to addressing the challenges; these included using WhatsApp in addition to SFG, using SFG to learn about other health topics, and increase financial support to purchase data to use SFG

In the presentation of quantitative results from the descriptive statistics, FSWs' acceptance of SFG in HIV prevention education was reported, with ratings of PU, PEOU, and acceptance being 4.5 stars or above on a 5-star scale. The quantitative data informed the interview questions development of the qualitative strand. The summary of the interview responses corresponded to PU, PEOU, and acceptance constructs from the quantitative strand.

A key aspect of SFG acceptance included cross-dataset concordance. An acceptance of SFG in HIV prevention education among FSWs in western Cameroon was

apparent in the qualitative findings and statistically associated with star ratings of 4.5 or above in the quantitative findings. Regarding *fit*, the qualitative findings (Bradley et al., 2012) primarily *confirmed* the quantitative findings (Curry et al., 2011). Thus, SFG acceptance was distinguished by valuable HIV information received, interaction with peers, and type of social media platform. The mixed methods study illustrates the *expansion* of the limited and new area of research (Stange et al., 2006). Integrated data expands the understanding of SFG acceptance by FSWs and confirms SFG acceptance across two datasets. This sequential explanatory mixed methods approach identified relevant advantages of SFG in HIV prevention among FSWs in Cameroon and SSA.

Recommendation for Future Work

This dissertation research will assist in the future of improvement and implementation of social media interventions that address HIV in vulnerable populations in SSA. The modification and scaling of the parent SFG HIV prevention project are vital to providing effective HIV prevention education to FSWs communities. Practical tools, such as the Intervention Scalability Assessment Tool (ISAT), will be utilized to make systematic assessments of the suitability of the SFG parent project for scale-up in different locations across Cameroon (Milat et al. 2020). The scaling of the project will consider Cameroon's infrastructure and sustainability of the intervention in different provinces of Cameroon and eventually in other sub-Saharan Africa countries.

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APPENDIX A

INSTITUTIONAL REVIEW BOARD LETTER OF APPROVAL

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM
Office of the Institutional Review Board for Human Use

470 Administration Building
701 20th Street South
Birmingham, AL 35294-0104
205.934.3789 | Fax 205.934.1301 |
irb@uab.edu

APPROVAL LETTER

TO: Blake, Hassanatu B

FROM: University of Alabama at Birmingham Institutional Review Board
Federalwide Assurance # FWA00005960
IORG Registration # IRB00000196 (IRB 01)
IORG Registration # IRB00000726 (IRB 02)
IORG Registration # IRB00012550 (IRB 03)

DATE: 18-May-2022

RE: IRB-300008893
In the Shadows, but Not Left Behind: Female Sex Workers' Acceptance of Social Media for HIV Prevention in the North West and South West Regions in Cameroon

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The IRB reviewed and approved the Initial Application submitted on 15-Apr-2022 for the above referenced project. The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services.

Type of Review: Exempt
Exempt Categories: 4
Determination: Approved
Approval Date: 17-May-2022
Approval Period: No Continuing Review

Student Name: Nassanatu B. Blake
Student Project Title: In the Shadows, but Not Left Behind: Female Sex Workers' Acceptance of Social Media for HIV Preven on in the North West and South West Regions in Cameroon

APPENDIX B

INSTITUTIONAL REVIEW BOARD CAMEROON BAPTIST CONVENTION HEALTH BOARD

CAMEROON BAPTIST CONVENTION HEALTH BOARD
INSTITUTIONAL REVIEW BOARD

Baptist Centre, Nkwen, P.O. Box 1, Bamenda, Northwest Region

February 4, 2022

Hassanatu Blake
School of Public Health,
Health Behaviour at University of Alabama
Birmingham, USA
hblake@uab.edu

IRB study number: IRB2022-04
Title of Protocol: **In the shadows, but not left behind: Female sex workers' acceptance of social media for HIV prevention in the North West and South West Regions of Cameroon.**

IRB approval date: February 4, 2022
IRB expiration date February 4, 2023

Dear Hassanatu,

Your proposed research seeks to explore the acceptance of social media in HIV prevention among Female Sex Workers in Cameroon. The objectives are: to evaluate the challenges and benefits of Secret Facebook Group (SFG) in the HIV pilot study intervention a year after the intervention was conducted, and also possible social media alternatives that could be used in the future.

Your study protocol was reviewed by two members of the CBC Health Board IRB and presented to the entire Board on January 21, 2022 during the Board meeting. The Board grants approval to this study.

Please understand that this is the ethical and safety approval for your study. FSWs are a vulnerable group and their practice is also illegal in Cameroon. You will conduct the study in accordance with the WMA Helsinki Declaration of GCP; wherein, it is the duty of the physician/researcher to promote and safeguard the health, well-being and rights of patients, including those who are involved in medical research. The approval is also based on the fact that New Life Clubs work closely with these group of persons. If you make any changes to the research protocol, please immediately send the IRB an amendment specifying the changes proposed.

The Board grants approval for this study for a one-year time period. Thereafter, before February 4, 2023, you will complete our renewal form/final report which will be attached to an email and return it to me. The completed form must be reviewed and approved by the Institutional Review Board prior to the expiration date of the current approval period. The fee to renew a study protocol is 10,000 cfa.

Your protocol has been assigned the above reference IRB protocol number. All correspondence to us should include:

1. The IRB protocol number,
2. Name of the principal investigator and,
3. full title of the study.

Finally, all abstracts, manuscripts, posters and presentations pertaining to the above protocol, must be submitted to the IRB for pre-publication approval. This approval is for academic research purpose only. If you will like to publish this in future, a CBC Health Service staff of the Department where the study was conducted must be Co-Principal Investigator.

Please feel free to contact me with any questions and/or concerns regarding the above. Copies of all correspondence regarding this proposal should be sent to me and to Zita Acha secretary, e-mail cbchbirb@gmail.com.

Sincerely,

Samuel Ngum, PGDip, MSc., (International Health

CAMEROON BAP 1ST CONVENTION INSTITUTIONAL REVIEW BOARD HEALTH SERVICES

Mr. NGUM Samuel, Chairperson, Chaircbcirb@gmail.com
Mrs. Acha Zita, Secretary, cbchbirb@gmail.com

APPENDIX C

INSTITUTIONAL REVIEW BOARD CAMEROON BAPTIST CONVENTION HEALTH BOARD RENEWAL

CAMEROON BAPTIST CONVENTION HEALTH BOARD
INSTITUTIONAL REVIEW BOARD

Baptist Centre, Nkwen, P.O. Box 1, Bamenda, Northwest Region

February 2, 2023

Hassanatu Blake
School of Public Health,
Health Behaviour at University of Alabama
Birmingham, USA
hblake@uab.edu

IRB study number: IRB2022-04
Title of Protocol: **In the shadows, but not left behind: Female sex workers' acceptance of social media for HIV prevention in the North West and South West Regions Cameroon**

Type of Review: Renewal of protocol
IRB approval Date: February 4, 2022
IRB Expiration Date: February 4, 2024

Dear Hassanatu,

Your above protocol was renewed on February 2, 2023, and the 10,000FCFA renewal fee was received. This letter is therefore to attest that your protocol has been granted renewal so you can continue with the research.

Please note that your next renewal will be on February 4, 2024, and if before the due date, you make any changes to your protocol, send an amendment request to the IRB.

Finally, all abstracts, manuscripts, posters, and presentations pertaining to the above protocol, must be submitted to the IRB for pre-publication approval.

Please feel free to contact me with any questions and/or concerns regarding the above. Copies of all correspondence regarding this proposal should be sent to me and to Zita Acha secretary, e-mail cbchbirb@gmail.com.

Sincerely,

Samuel NGUM, PGDip, MSc., (HI)
IRB Chairperson

Mr. NGUM Samuel, Chairperson, Chaircbcirb@gmail.com
Mrs. Acha Zita, Secretary, cbchbirb@gmail.com