

A Scoping Review of Biobehavioural Interventions to Improve PrEP Continuum of Care in Latin America

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Abstract

According to the literature, biobehavioural interventions or combined strategies would reduce the risk of HIV infection by more than 7,000 new cases each day, which would contribute to the battle facing Latin America, where despite the high incidence and prevalence of HIV in the region, access to PrEP (pre-exposure prophylaxis) is very limited. The objective of this research was, consistent with the PRISMA guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), to conduct a scoping review to assess the evidence of available outcome data on biobehavioural interventions and programs to address gaps in the PrEP continuum of care in Latin America. The search was conducted in the databases EBSCOhost, WoS, Scopus, and ProQuest, and include all studies published from 2010 to 2021. One hundred eighty-six studies were identified and evaluated according to the eligibility criteria in six stages starting with the elimination of duplicates until the selection of studies that met the previously mentioned criteria; at the end five studies were chosen which were submitted to the methodological quality assessment including compliance with ethical guidelines. Results show that biobehavioural interventions promoting PrEP in Latin America are effective in increasing condom use, decreasing HIV risk, and increasing PrEP awareness, uptake, adherence, and retention. The limited number of interventions in the PrEP continuum of care indicates a need for the uptake of dissemination and implementation science (D&I) frameworks. D&I could help facilitate the translation of evidence-based practices, interventions, and policies to address the HIV crisis in Latin America. *Keywords:* HIV, PrEP, biobehavioural interventions, Latin America, community-based health services, PRISMA.

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Una revisión de alcance de las intervenciones bioconductuales para mejorar la continuidad de la atención de la PrEP en América Latina

Resumen

Según la literatura, las intervenciones bioconductuales o estrategias combinadas reducirían el riesgo de infección por VIH en más de 7000 nuevos casos cada día, lo que contribuiría a la batalla que enfrenta América Latina, región en la que, a pesar de la alta incidencia y prevalencia del VIH, el acceso a la PrEP (profilaxis preexposición) es muy limitado. De acuerdo con las directrices de PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), el objetivo de esta investigación fue realizar una revisión de alcance para evaluar la evidencia de los datos de resultados disponibles sobre intervenciones bioconductuales y programas para abordar las brechas en el continuo de atención de PrEP en América Latina. La búsqueda se realizó en las bases de datos EBSCOhost, WoS, Scopus y ProQuest, e incluyó todos los estudios publicados de 2010 a 2021. Se identificaron ciento ochenta y seis estudios, y se evaluaron de acuerdo con los criterios de elegibilidad en seis etapas, iniciando por la eliminación de duplicados hasta la selección de estudios que cumplieran los criterios previamente mencionados; al final se eligieron cinco estudios, los cuales fueron sometidos a la evaluación de calidad metodológica, incluyendo el cumplimiento de los lineamientos éticos. Los resultados muestran que las intervenciones bioconductuales que promueven la PrEP en América Latina son efectivas para aumentar el uso del condón, disminuir el riesgo de VIH y aumentar la conciencia, la aceptación, la adherencia y la retención de la PrEP. El número limitado de intervenciones en el continuo de atención de la PrEP indica la necesidad de adoptar marcos científicos de difusión e implementación (D&I); marcos que podrían ayudar a facilitar la traducción de prácticas, intervenciones y políticas basadas en la evidencia para abordar la crisis del VIH en América Latina. *Palabras clave:* VIH, PrEP, intervenciones bioconductuales, América Latina, servicios de salud basados en la comunidad, PRISMA.

Introduction

Human Immunodeficiency Virus (HIV) is still a serious health threat in Latin America. HIV infections increased by 21% between 2010 and 2019. Gay men and other men who have sex with men (MSM), sex workers and their clients, and transgender people continue to be disproportionately impacted by HIV ([Joint United Nations Programme on HIV/AIDS \(UNAIDS\), 2019b, 2021, 2022a, 2022b](#)). Despite the high HIV incidence and prevalence, access to PrEP is limited in the region; Brazil, Mexico and Peru are the only countries in the region that provide PrEP through the public health system ([Joint United Nations Programme on HIV/AIDS \(UNAIDS\), 2020](#)), other countries like Chile, Ecuador, and Panama have smaller-scale programs.

Several factors are responsible for the disproportionate impact of HIV in the Latin America region, including political will, stigma, discrimination, immigration, and lack of insurance ([Brooks et al., 2019; Luz et al., 2019; Luz et al., 2018; Mimiaga et al., 2015](#)). Syndemic theory has been used as a framework to better understand how these factors contribute and exacerbate health problems or disease in individuals and populations, including HIV ([Blashill et al., 2020; Diaz, 2018; Martinez et al., 2016, 2020; Mimiaga et al., 2015](#)). Syndemic conditions such as substance use, experiences of childhood sexual abuse, and discrimination have contributed to the high

HIV incidence and prevalence in Latin America ([Blashill et al., 2020; Diaz, 2018; Mimiaga et al., 2015](#)). Studies conducted with MSM in Latin America found that participants who reported 6 or 7 syndemic factors had 4.1 times the odds of engaging in high-risk condomless anal sex compared to people presenting none of these factors ([Blashill et al., 2020; Mimiaga et al., 2015](#)). Another study found that individual with five or more syndemic factors had 72% lower odds of reporting antiretroviral therapy (ART) adherence ([Biello et al., 2016](#)).

Comprehensive approaches to HIV prevention and care are urgently needed in Latin America. Combination prevention refers to a combination of behavioural, biomedical, and structural approaches to HIV prevention to achieve maximum impact on reducing HIV transmission and acquisition. Biomedical interventions like Antiretroviral therapy (ART) reduce to pass HIV to sexual partners, other biomedical interventions to reduce HIV risk practices or the probability of HIV transmission per contact are male and female condoms, needle, and syringe programmes and, voluntary medical male circumcision. On the other hand, behavioural interventions can reduce the frequency of potential transmission events through strategies that are aimed at promoting healthy behaviours such as Counselling on risk reduction, Comprehensive sex education, Peer education programs, and social marketing campaigns. Finally, structural interventions aim at political and legal reforms, reducing stigma, discrimination, and

violence, promoting gender diversity and equity, as well as promoting human rights and health rights. So, combination prevention allows the health sector to use highly effective strategies according to scientific evidence while allowing them to teach populations about the arguments why they are favourable in their treatment, how to use it, as well as the relevance of adherence to it in the medium and long term (World Health Organization, 2016).

Pre-exposure prophylaxis (PrEP) should be provided together with other HIV prevention options and could help advance HIV prevention efforts and improve progress towards the 95-95-95 targets. PrEP has demonstrated high efficacy in reducing new HIV infections (Grant et al., 2014; Grinsztejn et al., 2018; Molina et al., 2017; Morne et al., 2020). The PrEP continuum includes (a) the identification of those at risk of HIV; (b) awareness of and intention to use PrEP; (c) access to PrEP; (d) receipt of PrEP prescription; and (e) adherence to PrEP as prescribed by a provider. Several interventions have been developed to increase PrEP uptake including mass media campaigns (Dehlin et al., 2019; McLaughlin et al., 2016); community-based efforts to address stigma (Aarons et al., 2017; Schnarrs et al., 2018; Shoptaw et al., 2020); and online tools to assess sexual risk, promote counselling, and support adherence (Cordova et al., 2020; Liu et al., 2019; Patel et al., 2018; Tanner et al., 2018).

Our study builds from the work outlined above and address the main gap in the literature related to the PrEP continuum of care in Latin America, as several PrEP implementation programmes have evaluated the feasibility, acceptability, cost-effectiveness and impact of treatment for people at substantial risk of acquiring HIV at North America and Caribbean but there is not information about implementation programmes at Latin America. The aim of this scoping review is to identify biobehavioural interventions related to the PrEP continuum of care in Latin America. Our scoping review adds to the literature of effective interventions to promote PrEP continuum of care in low-and-middle income countries.

Method

Type of study

The present scoping review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) guidelines (Munn et al., 2018;

Page, McKenzie, et al., 2021; Page, Moher, et al., 2021; Peters, Godfrey et al., 2020; Tricco et al., 2018). In preparation for this manuscript, we considered conducting a systematic review and meta-analysis. However, given the limited number of peer-reviewed manuscripts on the topic and the lack of PrEP interventions and services in the region, we opted to conduct a scoping review (Munn et al., 2018). Scoping reviews are an approach to inform decision making on identification and examination of literature when it exhibits a large heterogeneity or complex nature. This scoping review allowed for the synthesis of research of biobehavioural interventions to promote PrEP continuum of care.

Search Strategy

A thorough search of biobehavioural interventions to increase PrEP continuum of care in Latin America was conducted. Two authors conducted the primary search, screening and analysing data, the two other authors conducted analyses and provided suggestions to them on primary themes and preliminary observations, including the emergent theme on theoretical frameworks guiding PrEP interventions.

We consulted the following databases for the scoping review: 1) EBSCOHOST, 2) WOS, 3) SCOPUS, and 4) PROQUEST. The sensitive search consisted of controlled terms (including PrEP in subject headings) and words in the title, abstract, and author keywords. Search terms in English and Spanish included Pre-exposure prophylaxis (PrEP), HIV, biobehavioural interventions or program, and Latin America*. Our search included all studies published from 2010 to 2021. The articles selected for review met the following criteria: 1) the study was an intervention or program developed and tested in a Latin America's country, 2) the sample included Latin American participants, 3) the study reported implementation outcomes including PrEP uptake and adherence, and 4) the study included qualitative and/or quantitative outcomes.

Data Selection

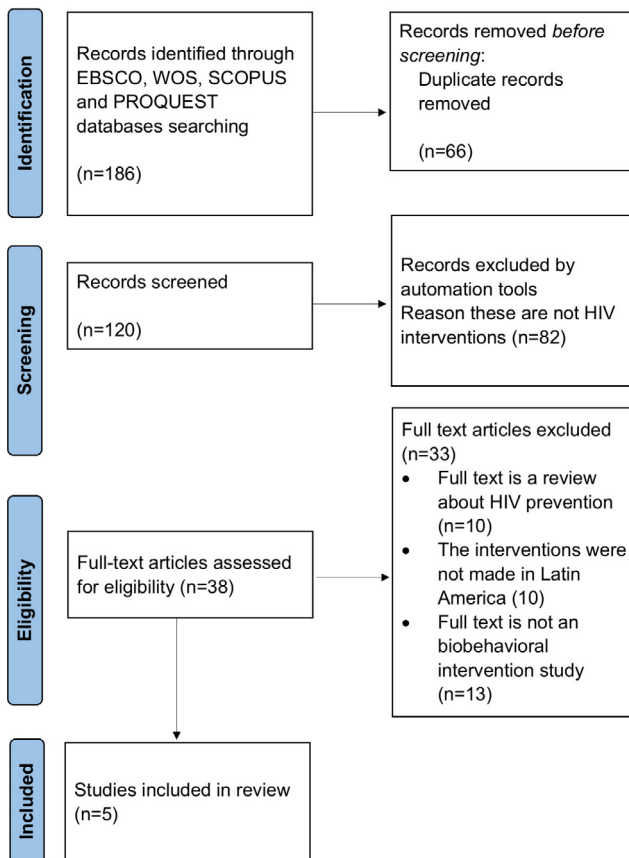
Articles were selected in six stages: first, duplicate search results were removed, and the remaining articles were compiled in a spreadsheet for the next stage of the review; second, studies on health perceptions, knowledge, or attitudes towards PrEP in the title or abstract were removed; third, the search was limited to results consisting

of studies using biobehavioural interventions to improve PrEP continuum of care; fourth, the results of the selection were limited to studies focused in Latin America; fifth, baseline and non-results interventions were removed, and sixth, PrEP interventions are described and key findings are synthesized.

Three authors performed the complete reading of the 38 eligible studies and entered in an Excel database, previously agreed by the team, the following information: general data of authors, year of publication, country where the study sample was located, title, purpose, theoretical model, sample size and population, type of intervention, language of intervention, and key findings. Inconsistencies were discussed between the three authors.

The selection process, based on PRISMA (ScR) guidelines (Peters, Godfrey et al., 2020; Tricco et al., 2018), is shown in Figure 1.

Figure 1
PRISMA diagram of search and selection



Quality evaluation

The methodological quality of the studies was evaluated through an ad-hoc Excel table in which the researchers individually responded to the quality indicators with *yes* or *no* taking into account aspects such as clarity, transparency, relevance and consistency of each of the sections of the article, as well as compliance with ethical aspects that included the use of informed consent and the anonymity of the participants (Downes et al., 2016). Subsequently, a team session was held to socialize the rating assigned to each criterion and agree on its inclusion if it obtained by consensus 90% or more positive responses in the total of indicators.

Results

Articles selection

The search retrieved 186 articles, of which 66 duplicates were removed. Of the remaining 120 articles, 82 were excluded after reading the abstract, and 33 were removed after reading the full text, leaving 5 articles for full critical appraisal.

Scope and characteristics of biobehavioural interventions

Most biobehavioural interventions and programs to promote PrEP were in Brazil ($n = 4$) and one in Peru ($n = 1$), from 2010 to 2021 (Table 1). They conducted with participants from different urban cities with a high prevalence of HIV infection (UNAIDS, 2018). These interventions represent a variety of theoretical and conceptual approaches used for different purposes, including empowerment and self-management (Clark et al., 2021; Marins et al., 2019) to evaluate feasibility, acceptability, retention, and adherence to PrEP through mobile health initiatives; syndemic theory (Hoagland et al., 2017) to show the additive effects of health disparities, social stigma, and discrimination as barriers to health promotion; and the behavioural model (Deutsch et al., 2015; Grinsztejn et al., 2018) to improve behavioural skills. Most interventions in this category used theoretical or conceptual approaches targeting individual-level risk factors (Clark et al., 2021; Deutsch et al., 2015; Grinsztejn et al., 2018; Marins et al., 2019), and just one of them used theory to articulate these dynamics at the broader social, community, and structural levels of HIV risk (Hoagland et al., 2017).

Table 1
Summary of research findings of interventions in PrEP in Latin-America

First Author, year of publication and study location	Title	Purpose	Population	Sample Size	Theoretical model	Type of intervention	Language of intervention	Key findings
Clark et al. (2021) Peru	“TransPrEP: Results from the Pilot Study of a Social Network - Based Intervention to Support PrEP Adherence Among Transgender Women in Lima, Peru” (p. 1).	“To promote PrEP uptake and adherence within existing TW social networks” (p. 2).	TW	89	Empowerment and self-management	“TransPrEP is a social network-based intervention to promote PrEP adherence among TW in Lima, Peru. Through a combination of individual counselling and group workshops” (p. 7).	Spanish	“At 3-month follow-up, they evaluated 40 participants and obtained 29 hair samples for tenofovir level measurements. Though no significant differences were observed, 36.4% (4/11) of participants of TransPrEP participants and 10.0% (1/10) of control participants had tenofovir levels > 0.023 ng/mg, consistent with ≥ 4 doses per week. 81.8% (9/11) of intervention and 40.0% (4/10) of control participants had any detectable tenofovir in their hair. Pilot assessment of that network-based intervention suggested a trend towards improved PrEP adherence, measured objectively, for TW in Peru” (p. 8).
Marins et al. (2019) Brazil	“Performance of HIV pre-exposure prophylaxis indirect adherence measures among men who have sex with men and transgender women: Results from the PrEP Brasil Study” (p. 1).	“To assess the concordance between a pharmacologic measure of exposure and “traditional”, feasible and low-cost adherence measures (pill count, medication possession ratio and self-report)” (p. 1).	MSM AND TGW	450	Empowerment and self-management	“Participants received a bottle containing 30 pills of FTC/TDF at enrollment and, subsequently, were provided with a sufficient supply of pills for daily treatment until the next study visit (weeks 4, 12, 24, 36 and 48). Study pharmacists instructed the participants to take one tablet daily and advised them to return TC/TDF pills in the original bottle to the pharmacy, whether used or not. At each study visit, the pharmacists provided adherence support and counseling. At week 48, they measured adherence using three different methods” (p. 3).	Portuguese	“They observed high levels of adherence among participants retained through 48 weeks in PrEP Brasil study using all indirect adherence measurements (MPR, pill count and self-report) as well as by TFV-DP levels. High adherence levels based on drug levels diverge from previous placebo-controlled PrEP trials” (p. 6).

First Author, year of publication and study location	Title	Purpose	Population	Sample Size	Theoretical model	Type of intervention	Language of intervention	Key findings
Grinsztejn et al. (2018) Brazil	“Retention, engagement, and adherence to pre-exposure prophylaxis for men who have sex with men and transgender women in PrEP Brazil: 48-week results of a demonstration study” (p. 1).	“To assess feasibility of daily oral tenofovir diphosphate plus emtricitabine provided at no cost to men who have sex with men (MSM) and transgender women at high risk for HIV within the Brazilian public health system” (p. 1).	MSM AND TW	450	Behavioral HIV prevention model	“After the enrolment visit, participants had visits at weeks 4, 12, 24, 36, and 48 for PrEP provision (tenofovir/emtricitabine) and clinical and laboratory evaluation, including HIV testing” (p. 3).	Portuguese	“450 participants-initiated PrEP, 375 (83%) of whom were retained until week 48. At week 48, 277 (74%) of 375 participants had protective drug concentrations consistent with at least four doses per week. 119 (80%) of 148 participants who reported sex with HIV-infected partners compared with 158 (70%) of 227 participants who did not. 67 (87%) of 77 participants who used stimulants compared with 210 (71%) of 298 participants who did not; and 232 (80%) of 289 participants who had protective concentrations of tenofovir diphosphate at week 4 compared with 42 (54%) of 78 participants who did not” (p. 6).
Hoagland et al. (2017) Brazil	“High pre-exposure prophylaxis uptake and early adherence among men who have sex with men and transgender women at risk for HIV Infection: The PrEP Brasil demonstration project” (p. 1).	“To describe PrEP uptake and early adherence assessed by TDF/FTC drug levels measured in dried blood spots (DBS) at week 4 after enrolment and its associated factors in the PrEP Brazil demonstration study” (p.2)	MSM AND TGW	450	Syndemic theory framework	The study follows the next steps: Pre-screening to all participants. Screening to eligible individuals. Enrolment visit, and 4-week visit.	Portuguese	“At week 4, 424 participants had DBS TFV-DP concentrations, 94.1% in the protective range, and 78% were in the highly protective range. Condomless receptive anal intercourse in the prior 3 months was also associated with higher drug levels” (p. 11).

First Author, year of publication and study location	Title	Purpose	Population	Sample Size	Theoretical model	Type of intervention	Language of intervention	Key findings
Deutsch et al. (2015) Brazil Ecuador Peru South Africa Thailand USA	“HIV pre-exposure prophylaxis in transgender women: a subgroup analysis of the iPrEx trial” (p. 1).	“To report an unplanned subgroup analysis of transgender women in the iPrEx randomised controlled trial and open-label extension with respect to PrEP efficacy, effectiveness, PrEP drug concentrations, and patterns of adherence” (p.2)	TGW	339	Behavioral HIV prevention model	“Enrolled participants were followed up for HIV seroconversion and adverse events at weeks 4, 8, 12, and every 12 weeks thereafter in the randomised controlled trial and open-label extension. There was an additional scheduled visit at week 16 in the trial. Dried blood spots were collected only in the open-label extension and allowed an objective measurement of long-term PrEP use. Hormone therapy was not provided to study participants by any of the study sites” (p. 4).	English Spanish Portuguese French	“Among transgender women, there were 11 HIV infections in the PrEP group and ten in the placebo group (hazard ratio 1.1, 95% CI 0.5–2.7). In the PrEP group, drug was detected in none of the transgender women at the seroconversion visit, six (18%) of 33 seronegative transgender women ($p=.31$), and 58 (52%) of 111 seronegative MSM ($p<.0001$). PrEP use was not linked to behavioural indicators of HIV risk among transgender women, whereas MSM at highest risk were more adherent. PrEP seems to be effective in preventing HIV acquisition in transgender women when taken, but there seem to be barriers to adherence, particularly among those at the most risk. Studies of PrEP use in transgender women populations should be designed and tailored specifically for this population, rather than adapted from or subsumed into studies of MSM” (p. 8).

Abbreviations: FSW, female sex workers; TW, Transgender women; MSW, Male sex workers; TGW, Transgender women; MSM, Men who have sex with men; CBPR, community based participatory research; TDF/FTC, tenofovir disoproxil fumarate / emtricitabine.

Modality of interventions

Different studies employ a combination of individual counselling, group workshops, and internet-based technologies to support interactive dialogue through the exchange of user-generated content in online networks, obtain data about participants characteristics, disseminate health information, promote medication adherence, and provide social support were used (Clark et al., 2021; Grinsztejn et al., 2018; Hoagland et al., 2017). Besides, one intervention used peer navigator (Deutsch et al., 2015) to assist in promoting treatment adherence and foster trust in the individual's healthcare, and one used peer-led intervention focused on healthcare education (Marins et al., 2019).

*Outcome effects of biobehavioural interventions in Latin America**Biobehavioural interventions increase condom use*

In Peru, TransPrEP (Clark et al., 2021) study including 89 TW, showed that at 3-Month follow-up, intervention and control groups reported dramatic reductions in their number of sexual partners, reporting a median of four partners total (IQR 1, 10) and four receptive anal intercourse partners (IQR 1, 10) in the prior 30-days. Condomless receptive anal intercourse was reported slightly more often by TW in the control [median 1 (IQR 0, 4)] than the intervention group [median: 1 (IQR 0, 2)].

Biobehavioural interventions decrease the risk of HIV infection

PrEP Brazil study (Grinsztejn et al., 2018) with 450 MSM and TW, showed that the mean number of sexual partners in the previous 3 months decreased from 11.4 at enrolment to 8.3 at week 48 ($p=.0013$). Also, in participants aged 18-24 years, the mean number of partners also decreased, from 11.9 (SD 31.45) at enrolment to 6.5 (13.32) at week 48 ($p=.0155$).

Biobehavioural interventions increase PrEP awareness, willingness and adherence

A social network-based intervention to promote PrEP adherence among TW in Peru (TransPrEP) showed that since the baseline frequency of tenofovir in hair samples was higher in the intervention arm (80.0% vs. 51.1%) (Clark et al., 2021). In Brazil interventions showed that PrEP uptake (60.9%) is highly reported (Hoagland et al., 2017).

In the PrEP Brazil demonstration project (Hoagland et al., 2017), from the 450 enrolled participants, 26 (5.8%) did not collect dried blood spots (DBS) at week 4. For the 424 (94.2%) participants who had DBS samples at week 4, 5.9% ($n = 25$) had tenofovir-diphosphate (TFVDP) level consistent with <2 doses/week, 15.6% ($n = 66$) with 2-3 doses/week and 78.5% ($n = 333$) were in the highly protective range, corresponding to ≥ 4 doses/week. Further, another study (Marins et al., 2019) showed that at week 48, 277 (74%) of the 375 participants had highly protective drug levels consistent with at least four doses per week, and median adherence rates were 1.10 (IQR 0.98-1.31) for medication possession ratio, 97.14% (IQR 88.89-100.00) for pill count and 100.00% (IQR 93.33-100.00) for self-report.

Discussion

The objective of this study was to review and synthesize the scientific evidence of interventions based on the PrEP continuum of care in Latin America through the systematic review of the literature. The strongest evidence is that PrEP represents a promising tool for high impact prevention in Latin America. Studies have demonstrated the efficacy of daily oral antiretroviral medications to prevent HIV acquisition. Targeted biobehavioural interventions and programs that focus on the promotion of PrEP and HIV prevention services have proven to be effective in reducing HIV infection (Clark et al., 2021; Deutsch et al., 2015; Grinsztejn et al., 2018; Hoagland et al., 2017; Marins et al., 2019). These interventions use biomedical strategies focused on condom use and PrEP, while implementing behavioural strategies such as risk reduction counselling and peer educator programs, which are consistent with the references proposed by the literature for their effectiveness. It is relevant to highlight that this biobehavioral interventions are also accompanied by structural strategies, focused on reducing stigma and discrimination of the populations to which they are directed (UNAIDS, 2021; World Health Organization, 2016).

Most of the peer-reviewed published interventions were conducted in Brazil, even though other countries in the region face critical structural challenges in the fight against HIV (Luz et al., 2019; Ravasi et al., 2016), probably because combination HIV prevention requires planning processes

that exceed the capacities of low- and middle-income countries in Latin America. These processes include the technical, financial and scientific capacity for prevention services to identify the predominant modes of transmission, geographical patterns of transmission, estimate the size of the population at risk and its characteristics, and articulate a combination HIV prevention national plan (Samuel, 2019; UNAIDS, 2018).

Regarding population characteristics, most of them focused on MSN and TW, showing differences significant specially in TW PrEP adherence due to the attitudes and misconceptions about its side effects (Longino et al., 2020; Mustanski et al., 2018; Wilson et al., 2019; Wood et al., 2019). None of the interventions were implemented in Colombia, Chile, Ecuador or Venezuela, where HIV rates remain high (UNAIDS, 2018, 2019b, 2019a, 2020). Efforts are needed to promote PrEP among other key populations including women impacted by interpersonal violence and undocumented immigrants, including undocumented Venezuelan immigrants in Colombia, Brazil, and Chile.

The critically appraised studies offer key lessons for biobehavioural HIV prevention and care interventions/services delivery in Latin America. First, our scoping review found that biobehavioural interventions contribute to decrease the risk of HIV infection; increase PrEP awareness, willingness, and adherence; and increase condom use. Our review is consistent with findings from previous reviews in other regions. A review conducted by Chou et al. (Chou et al., 2019), found that adherence to PrEP varied widely (22%-90%) and that greater PrEP adherence is associated with greater PrEP efficacy. Similarly, a review on PrEP among cisgender FSW and women who use drugs (WWUD) (Glick et al., 2019) found adherence to be high among FSW (66%-95%), and slightly lower among WWUD (42.2%-88.9%). They found one study, as well, reported anticipated PrEP adherence in which 78% participants said they would take PrEP even if they had to wear condoms for full HIV protection. Another review of potential interventions to support adherence (Marcus et al., 2014) found that two-thirds of interventions (61%) reported a statistically significant improvement in at least one adherence measure. Finally, a recent review of PrEP services (Hillis et al., 2020) showed that adherence increases in one study from 79% at 16 weeks post-initiation to 88% at 28 weeks, and that regular patient counselling promoted skills on a patient to empower them about PrEP.

Governmental health care services that improve the PrEP continuum of care and contribute to the strengthening of the psychosocial wellbeing are urgently needed in Latin America. Our scoping review highlights the limitations of the programs implemented in the region, including lack of financial support and follow up data to demonstrate effectiveness. Furthermore, more interventions, programs and services are needed to address intersectional stigma, structural barriers to health systems engagement and services integration.

None of the evidence-based interventions reviewed in this systematic review in Latin America incorporated the socioecological model to guide the development, implementation, and analysis of biobehavioural interventions to promote the PrEP continuum of care. This is consistent with other research that calls upon the combined strengths of qualitative, quantitative, clinical methods of inquiry and grounded theoretical models to guide HIV prevention research. A review of 30 randomized clinical trials found that more than two thirds of studies did not refer to any specific approach and only one third mentioned theoretically informed methods (Lewin et al., 2009). The socioecological model could serve as an important methodological strategy to promote the PrEP continuum of care in the region. The socioecological model uses a four-level complex interplay between individual, relationship, community, and societal factors (Centers for Disease Control and Prevention, 2015) to analyse unequal conditions and social-structural barriers. The model could help strengthen and inform HIV prevention and care strategies in the region. Its focus on societal factors including governmental institutions and healthcare system could help inform the update of interventions and programs.

Conclusions

To our knowledge, this is the first scoping review of biobehavioural interventions and programs to promote PrEP in Latin America. Study findings highlight the lack of access to HIV preventive treatments such as PrEP among key populations. It also shows the lack of programming and implementation science research to assess the effectiveness of PrEP. Our Results also highlight the need for PrEP initiatives to reach other vulnerable populations, including sex workers, undocumented immigrants (e.g., undocumented

Venezuelan immigrants), and women impacted by IPV. We realise the relevance and significance of Community Based Organizations (CBO) in Latin America in the provision of PrEP services, including awareness and information. Given the role of structural conditions, including access to services, lack of comprehensive governmental policies related to PrEP, and structural stigma in the promotion of PrEP, efforts are needed to promote community-level interventions.

This study has some limitations. First, the cut-off date for peer-reviewed articles was Jun 31, 2021, therefore, the scoping review may have missed relevant publications. Second, the scoping review was limited to articles published in a selected group of databases: EBSCOHOST, SCOPUS and WOS. We acknowledge and recognize the existence of journals in the region that just focus on print media and this scoping review did not include a search of that literature. Third, given the lack of effective biobehavioural interventions to promote PrEP in the region, the review was limited to the small number of interventions. Fourth, we did not focus on the existing grey literature (e.g., conference abstracts, white papers, briefs, and reports). Future work should consider an analysis of the grey literature.

The study highlights the critical role of peer-navigation services in assisting and supporting PrEP continuum of care. Promotores or peer-navigators serve as role models and play several roles in assisting individuals with similar life challenges and experiences. Peers can answer relevant questions about PrEP, including side effects. Findings also suggest the need for inclusive governmental policies related to HIV prevention and care. Community advisory boards and scientific advisory boards have proven to be successful in working with government entities to effect change. Structural stigma and discrimination contribute to the further marginalization of key populations in the region, including sexual and gender minorities, undocumented immigrants, and sex workers. Community and multi-level programs, including educational anti-stigma campaigns, can address issues related to discrimination, misinformation and negative attitudes and beliefs.

Study findings shed light on the current PrEP landscape in the region. Most of the PrEP promotion is carried out mostly by CBOs and it is heavily focused on information and awareness. Brazil is the only country in region that offers PrEP through its national public health system. Our scoping review also found that CBOs Latin America play a critical

role in the provision of other services including psychosocial support, legal assistance, and access to comprehensive health care. Findings also support the important role of social media to promote health services, including PrEP services. CBOs in the region continued to provide services and information despite the COVID-19 pandemic. Future research is needed to further explore the impact of these social media strategies and online models of care, including telehealth, on health and wellbeing. The analysis and dissemination of these strategies could help inform future responses to local public health issues and/or pandemics.

The uptake of implementation science frameworks could help address some of the critical gaps in the PrEP Continuum of care, including access to and retention in services. For example, the health equity implementation science framework could help identify clinic-level implementation challenges and facilitators related to PrEP care (Baumann & Cabassa, 2020). Through the health equity implementation science framework, researchers and PrEP providers could integrate health equity domains to existing PrEP implementation and demonstration projects: (1) culturally relevant factors of recipients including race and ethnicity, (2) domains related clinical encounter or patient-provider interaction, and (3) societal context such as stigma, discrimination, and immigration status.

Conflict of interest

The authors declare that they have no conflict of interest and have participated in the design and execution of the scoping review as well as in the review, editing and final preparation of the manuscript.

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