


SYSTEMATIC REVIEW

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# Pre-exposure Prophylaxis (PrEP) implementation among latino MSM: a qualitative scoping review of implementation determinants and change methods

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## Abstract

**Introduction** The increasing rates of HIV among Latino men who have sex with men (MSM) necessitate innovative and rigorous studies to evaluate prevention and treatment strategies. Pre-exposure prophylaxis (PrEP) is a highly effective tool in preventing HIV acquisition and plays a crucial role in the Ending the HIV Epidemic in the U.S. initiative. However, there is a scarcity of PrEP research specifically focused on Latino MSM, and the factors influencing its implementation remain largely unknown.

**Methods** To address this gap, we conducted a comprehensive review exploring the determinants (barriers and facilitators) of PrEP implementation among Latino MSM, as well as the change methods (implementation strategies and adjunctive interventions) that have been evaluated to promote its adoption. Our review encompassed 43 peer-reviewed articles examining determinants and four articles assessing change methods. Determinants were coded using the updated Consolidated Framework for Implementation Research (CFIR 2.0) to understand the multilevel barriers and facilitators associated with implementation.

**Results** The majority of research has focused on PrEP recipients (i.e., patients), primarily examining their awareness and willingness to use PrEP. Fewer studies have explored the factors influencing clinicians and service delivery systems. Additionally, the evaluation of change methods to enhance clinician adoption and adherence to PrEP and recipient adherence to PrEP has been limited.

**Conclusion** It is evident that there is a need for culturally adapted strategies tailored specifically for Latino MSM, as the current literature remains largely unexplored in this regard. By incorporating principles from implementation science, we can gain a clearer understanding of the knowledge, skills, and roles necessary for effective cultural adaptations. Future research should emphasize factors influencing implementation from a clinician standpoint and focus on innovative change methods to increase PrEP awareness, reach, adoption, and sustained adherence among Latino MSM.

**Keywords** Pre-exposure Prophylaxis, Latino MSM, Implementation Science, Determinants, Barriers, Facilitators, Implementation Strategies, Adjunctive Interventions, Consolidated Framework for Implementation Research

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### Contributions to the literature

- To effectively accomplish the goals of the *Ending the HIV Epidemic Initiative*, it is crucial to adopt a comprehensive approach in creating, evaluating, and expanding effective PrEP adjunctive interventions and implementation strategies that are designed for Latino MSM.
- Our review emphasizes that PrEP uptake should be viewed as an ongoing process rather than a one-time intervention. This necessitates sustained engagement between clinicians, clinics, and patients to ensure adherence to PrEP.
- Moreover, our review identifies methodological limitations that hinder our understanding of key implementation determinants within the inner, outer, and process domains of CFIR.

### Introduction

Latino men who have sex with men (MSM) face significant disparities in HIV rates, accounting for 22% of all new HIV diagnoses in 2019 [1]. However, evidence-based interventions like pre-exposure prophylaxis (PrEP) have not been adequately implemented and made accessible to Latino MSM [1–4]. The provision and adoption of PrEP play a crucial role in the United States' *Ending the HIV Epidemic* (EHE) initiative led by the federal government [5]. This ambitious plan aims to achieve a remarkable 90% decrease in HIV incidence by 2030. To accomplish this, the EHE initiative strives to ensure that at least 50% of eligible individuals receive PrEP treatment by 2025. Shockingly, only 31.3% of Latino MSM individuals with an indication for PrEP received a prescription in 2017, indicating the urgent need for targeted interventions to enhance PrEP accessibility among this population, as reported by the Centers for Disease Control and Prevention (CDC) [2, 6–8].

Based on the MSM cycle of the National HIV Behavioral Surveillance System, there is a significant disparity in the awareness and usage of PrEP among Latino MSM [7]. Although 84% of surveyed HIV-negative Latino MSM were aware of PrEP, only 12% reported using it. Additionally, in 2020, the ratio of Latino MSM PrEP users to new HIV diagnoses was 6:1, compared to 26:1 for non-Hispanic White PrEP users in this population [8]. This discrepancy is likely due to Latino MSM facing greater barriers to PrEP access, such as cost, stigma, low readiness and motivation, and a lack of proximate, accessible, and culturally sensitive PrEP services [3, 4]. These findings underscore the unique challenges this population faces and the urgent need for targeted interventions to improve PrEP access among Latino MSM.

Implementation science seeks to remove the disparity between knowledge and adoption of PrEP, providing valuable insights to effectively address the unmet needs of this population [9].

The successful implementation of interventions such as PrEP depends on multilevel contextual factors known as implementation determinants [10, 11]. Implementation determinants are barriers that hinder implementation and facilitators that support it. To ensure generalizability and account for the multitude of potential determinants, several frameworks have been proposed. Among these, the Consolidated Framework for Implementation Research CFIR [10, 11] has emerged as the most widely cited [12, 13].

*Implementation strategies* encompass the methods and techniques utilized to enhance implementation and service outcomes in clinical programs or practices, which ultimately lead to improved patient and population outcomes. These outcomes primarily revolve around the adoption, execution, and sustainability of said programs [14]. The widely recognized taxonomy known as Expert Recommendations for Implementing Change (ERIC) [15] identifies nine overarching categories: engaging consumers, employing evaluative and iterative strategies, modifying infrastructure, adapting, and tailoring to specific contexts, developing stakeholder interrelationships, utilizing financial strategies, supporting clinicians, providing interactive assistance, and training and educating stakeholders.

While *implementation strategies* focus on determinants within the delivery system, *adjunctive interventions* target factors among recipients (i.e., patients) [16]. These are factors that influence the uptake and adherence to interventions like PrEP. *Adjunctive interventions* serve as supplementary methods to enhance the effective utilization of clinical interventions [16]. Examples of *adjunctive interventions* for PrEP include digital tools that provide reminders, peer support programs, and individual adherence counseling. These interventions aim to assist recipients in initiating and maintaining adherence to PrEP. Collectively, we refer to implementation strategies and adjunctive interventions as *change methods*. The main difference between them is their target of action [16, 17]. Implementation strategies target the providers and delivery systems, while adjunctive interventions target the patients.

Despite the growing recognition of the need for targeted change methods to address disparities in PrEP provision, uptake and adherence, it remains unclear which specific change methods have proven most effective for Latino MSM populations and the service systems that provide their care. This lack of clarity arises from several factors, including diverse approaches employed in

different settings, the absence of standardized reporting on implementation outcomes, and the complex interplay of factors that influence PrEP awareness, access, and utilization among Latino MSM individuals [4, 12, 17–20].

For researchers and health practitioners addressing disparities in PrEP use among Latino MSM, it is crucial to systematically analyze implementation determinants and change methods. Recent studies highlight unique challenges, including language and cultural barriers, perceived service benefits, policy impacts, and access issues (e.g., transportation, education, immigration status) [4]. By examining these factors and evaluating specific approaches, public health initiatives can optimize change methods for maximum impact. To summarize current implementation knowledge and highlight areas needing further research, we conducted a scoping review on implementation determinants and change methods for PrEP prevention interventions among Latino MSM. To address these objectives, we will address the following research questions:

1. What are the prominent barriers or facilitators of implementing PrEP among Latino MSM?
2. Which *change methods* (i.e., implementation strategies and adjunctive interventions) have been used to promote PrEP engagement among Latino MSM communities?
3. What are the gaps in the existing literature to improve implementation outcomes for Latino MSM as well as settings that serve this population?

## Methods

We conducted a scoping review on Latino MSM based on literature collected from two larger and previously published systematic reviews focused on implementation determinants of PrEP for all populations in the U.S [12] and change methods for PrEP [17]. From November 2020 to January 2022, a comprehensive database search was conducted to identify studies related to PrEP implementation. The full protocol for the initial systematic review has been described elsewhere [12, 20]. Through a multi-step process involving semi-automated and manual screening, 20,265 unique records were identified from Ovid MEDLINE, PsycINFO, and Web of Science. To ensure data accuracy, the number of unique records was further reduced through deduplication, title, abstract screening, and full-text review. For a detailed overview of the exclusion process, please refer to Fig. 1 in the PRISMA-ScR guidelines [21].

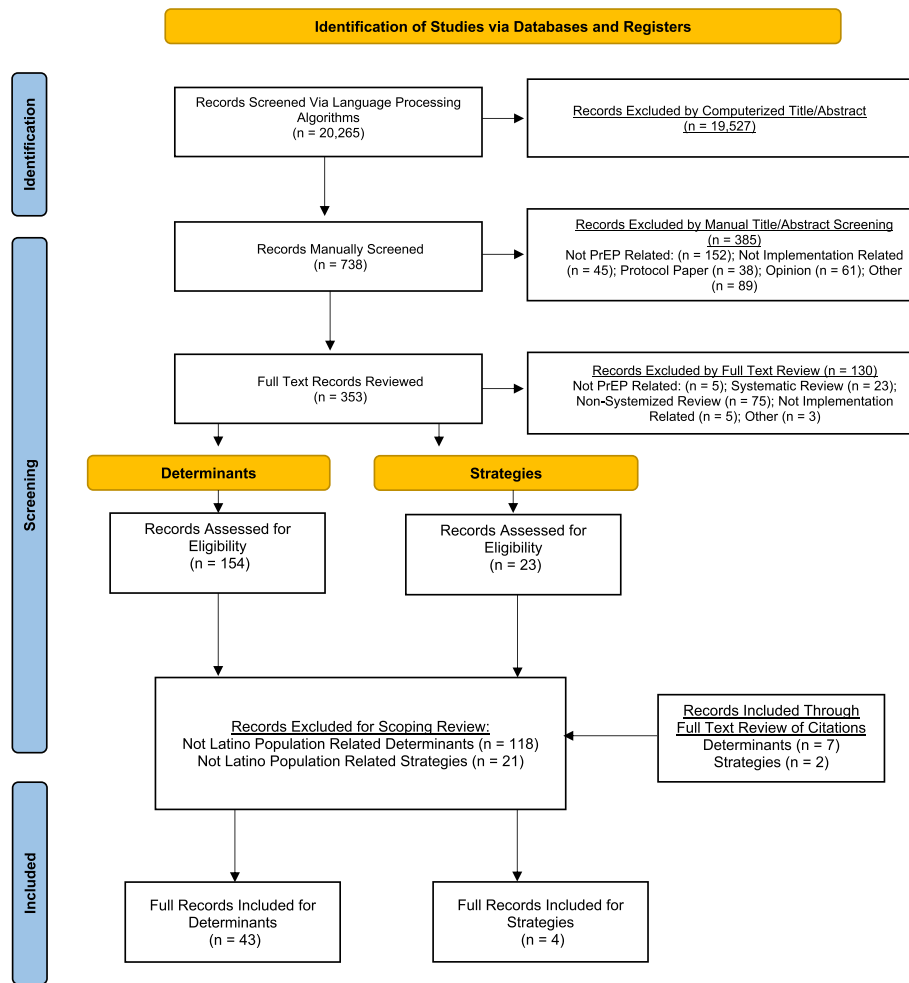
### Study identification and inclusion criteria

The initial systematic review on determinants analyzed 286 articles, and the review on *change methods* examined

44 articles. Determinants were categorized using the updated CFIR [11]. In our analysis, we identified a subset of implementation determinant papers focused on Latino MSM from the review conducted by Li and colleagues [12]. To accomplish this, we utilized our team's publicly accessible tool, the HIV Implementation Literature Review Dashboard (<https://hivimpsci.northwestern.edu/dashboard/>). By leveraging the filter functions, we were able to select articles that fulfilled the following criteria: (a) U.S.-based study population and participants, (b) study focusing on Latino MSM, (c) study relevant to PrEP, (d) inclusion of original empirical research, and (e) study outcomes aligned with dissemination and implementation science. To meet our inclusion criteria, studies needed to have a sample consisting of at least 40% Latino MSM or provide results based on racial/ethnic identity. Leveraging our team's prior experience in coding for determinants and strategies across diverse populations and health settings [12, 19, 20], we determined that this criterion would better address the specific needs of Latino MSM. This approach avoids conflating their data with other racial/ethnic populations, which could obscure our findings' implications. Our dashboard search yielded 36 articles. Additionally, we employed snowball sampling methods by reviewing the citations of these articles and identified seven additional articles. In total, we coded 43 studies using MAXQDA, a mixed-methods data analysis software [22]. Our coding team consisted of three PhD-level researchers with expertise in implementation science, HIV, and health equity, and extensive experience in coding for determinants and strategies.

### Determinant coding procedures

Each article was coded using an adapted version of the CFIR 2.0 to identify the determinant and construct [11]. The CFIR is divided into five key domains: *Innovation* (factors related to the use or implementation of PrEP), *Inner Setting* (the environment where PrEP is implemented, such as a hospital or community clinic), *Outer Setting* (the sociopolitical and cultural context of delivery and uptake), *Process* (the necessary activities and strategies for implementing or using PrEP), and *Individuals* (the roles and characteristics of those implementing or using PrEP). The Individuals domain further includes subdomains concerning individual roles, such as providers delivering the innovation, clinicians, or patients receiving it. Additionally, it covers characteristics associated with behavior change through the COM-B System, focusing on Capability, Opportunity, and Motivation related to the individual's behavior [20, 23]. Capability refers to an individual's knowledge, memory, attention and decision process, physical and psychological ability to carry out



**Fig. 1** PRISMA-ScR Latino scoping review

a behavior, as well as an ability to regulate one’s own behavior. Opportunity involves awareness, availability, scope, social influences, and environmental context and resources. Motivation includes an individual’s reflective beliefs about their capabilities, beliefs about the consequences of enacting or changing behavior, their willingness, goals and intentions around enacting behavior, as well as their optimism and emotional responses. In addition to CFIR constructs, we added the additional codes: *Characteristics Not Otherwise Associated With Behavior* (e.g., demographic differences) [19]. We also coded for the valence of the determinant (barrier vs. facilitator), and whether the results were specific to Latino MSM or combined with other target populations (e.g., non-Latino Black MSM). We adapted the CFIR 2.0 by expanding it to not only include implementation determinants, which capture delivery setting-level barriers and facilitators, but also innovation determinants, which capture recipient (i.e., patient level) barriers and

facilitators. Although not explicitly captured by CFIR 2.0, these determinants are important because most of the literature related to PrEP focuses on patient-level determinants [20]. Therefore, we expanded our codebook to be able to capture patient-level perspectives at each CFIR domain level, as similarly described in Li et al. [12]. Finally, we exported the coded segments to Excel for data cleaning and descriptive analysis.

**Change method coding**

We identified an additional 2 change methods papers from Merle et al. [17] and two articles from snowball sampling, searching citations and utilizing Google Scholar to identify forward citations. These change methods are described according to Proctor and colleagues [24] recommendations for implementation strategy specification, as described elsewhere [17]. The coding process followed these categories:

1. Structure or core components of the change method: identifying discrete components within multicomponent or packaged change methods, which comprise multiple activities.
2. For implementation strategies, we used the Expert Recommendations for Implementing Change (ERIC) taxonomy, which identifies 73 discrete implementation strategies categorized into nine domains based on conceptual similarity to categorize each of the components within each strategy [13]. The ERIC taxonomy domain and associated code for each core component [13].
3. Measured implementation outcome(s) (e.g., awareness, reach, adoption, fidelity).
4. Study design, such as randomized controlled trials.

We assessed the certainty of the presence of these elements using a 4-point scale per category, based on the following criteria: 3 – We have complete confidence in the presence of this element, without the need for any inference to replicate it; 2 – We are moderately confident in the presence of this element, requiring some inference to replicate it; 1 – We have minimal confidence in the presence of this element, with a high level of inference needed to replicate it; 0 – The element is either not present or its presence cannot be determined. For this review, we examined all change methods initially coded for Latino populations.

## Results

### CFIR determinants

Out of the 43 articles reviewed on PrEP implementation determinants among Latino MSM, a total of 237 determinants were documented across the CFIR 2.0 domains (Table 1). Among these, 148 were identified as barriers and 89 were facilitators. The domain with the highest number of recorded determinants was *Individuals* ( $n=138$ ; 58.2%), followed by *Innovation* ( $n=51$ ; 21.5%), *Outer Setting* ( $n=38$ ; 16.1%), *Inner Setting* ( $n=6$ ; 2.5%), and finally *Implementation Process* ( $n=4$ ; 1.7%). Since *Process* determinants were infrequently measured, mainly because of significant conceptual overlap with implementation strategies (e.g., training, planning, adapting), we choose not to discuss them as determinants in this context. However, we will delve into *Process* determinants as part of our comprehensive review of *change methods* for PrEP among Latino MSM.

Among the 237 determinants, only 112 were specifically relevant to Latino MSM. These determinants either had a sufficiently large sample size of Latino MSM—comprising at least 40% of the participants—or presented results specific to this group. As discussed elsewhere, many studies in the larger systematic review

often grouped MSM subpopulations together due to the small sample sizes of racial and ethnic minority MSM. Additionally, for studies with small sample sizes, such as qualitative inquiries among providers, we included those that offered results pertinent to Latino MSM. These articles presented a comprehensive analysis tailored to the unique needs of Latino MSM and are summarized in Table 1. The remaining 125 determinants came from articles with a very small Latino sample, ranging from 2 to 37%. As a result, our scoping review focuses specifically on the 112 PrEP implementation determinants that are most relevant to Latino MSM. This approach allows us to offer a comprehensive overview of published studies, effectively informing implementation efforts.

### Innovation characteristics

Among the 51 determinants in the *Innovation* domain, 31 (60.8%) specifically addressed barriers faced by Latino MSM regarding PrEP. The remaining 20 determinants were derived from articles with a limited sample size of Latino MSM, accounting for less than 40% of the total sample. *Innovation Characteristics* encompass the fundamental and adaptable aspects of an innovation [11]. Studies identifying determinants utilized focus group, interview, and/or survey data to evaluate patients' and/or providers' perceptions of PrEP's *complexity*, *evidence base*, and *cost*. Five articles discussed the perceived complexity and challenges of obtaining PrEP from both the recipient and provider perspectives. These articles highlighted the intricate steps involved in efficiently accessing PrEP. For instance, Doll et al. [25] conducted interviews with PrEP implementation staff and found that Latino youth often felt frustrated and overwhelmed by the process of accessing and maintaining participation in PrEP care. Similarly, both this study and a separate study among Latino MSM in Texas revealed specific barriers to PrEP implementation related to the *costs* of PrEP [26]. Specifically, out of the 176 Spanish and English-speaking Latino MSM recruited by Garcia et al. [26], 117 reported additional obstacles to PrEP, including concerns about potential side effects such as nausea, dizziness, vomiting, diarrhea, or stomach pain. Furthermore, most of their sample also expressed concern about liver and kidney damage (83.1%).

In the *Innovation Evidence-Base* construct, fewer determinants were measured ( $n=3$ ). One study conducted by Lelutiu-Weinber et al. [27] revealed that compared to non-Hispanic White MSM, Latino MSM consistently exhibited lower beliefs regarding the efficacy of PrEP. Specifically, they were less likely to believe that PrEP could reduce the risk of HIV acquisition during receptive anal sex, insertive sex, and sex with a partner living with HIV. This study also examined determinants within



**Table 1** Number of measured and mentioned determinants by CFIR 2.0 Construct among articles related to implementation to PrEP among latino MSM<sup>a</sup>

CFIR 2.0 Domain & Construct		Mentioned	Measured
<b>Innovation Characteristics</b>	Innovation Source	-	-
	Evidence Base	6	3
	Relative Advantage	3	-
	Adaptability	2	-
	Trialability	-	-
	Complexity	11	6
	Design Quality and Packaging	-	-
	Cost	12	7
	Other Intervention characteristic	17	11
	<b>Subtotal</b>	<b>51</b>	<b>31</b>
<b>Outer Setting</b>	Critical Incidents	-	-
	Local Attitudes	16	11
	Local Conditions	2	1
	Partnerships and Connections	1	1
	Societal Pressure	-	-
	Policies and Laws	7	3
	Financing	-	-
	Structural or Systemic Oppression	12	7
<b>Subtotal</b>	<b>38</b>	<b>23</b>	
<b>Inner Setting</b>	Structural Characteristics	1	-
	Relational Connections	-	-
	Communication	-	-
	Culture	-	-
	Tension for Change	-	-
	Compatibility	1	-
	Relative Priority	-	-
	Incentive Systems	-	-
	Mission Alignment	-	-
	Available Resources	4	3
<b>Subtotal</b>	<b>6</b>	<b>3</b>	

**Table 1** (continued)

CFIR 2.0 Domain & Construct		Mentioned	Measured
<b>Characteristics of Individuals</b>	High-Level Leaders	-	-
	Mid-Level Leaders	-	-
	Opinion Leaders	-	-
	Implementation Facilitators	-	-
	Implementation Leads	-	-
	Other Implementation Support	-	-
	Innovation Deliverers: Need	-	-
	Innovation Deliverers: Capability (Self-Efficacy)	9	3
	Innovation Deliverers: Opportunity	-	-
	Innovation Deliverers: Motivation	4	-
	Innovation Deliverers: Characteristics Not Associated with Behavior	1	-
	Innovation Recipients: Need	1	-
	Innovation Recipients: Capability (Self-Efficacy)	17	8
	Innovation Recipients: Opportunity	13	8
	Innovation Recipients: Motivation	30	11
Innovation Recipients: Characteristics Not Associated with Behavior	63	25	
<b>Subtotal</b>	<b>138</b>	<b>55</b>	

<sup>a</sup> Mentioned refers to determinants referenced in analyzed papers that were not identified by the authors of said papers in their own research. Measured refers to determinants identified by authors through the research they conducted

the *Other Innovation Characteristics* construct ( $n = 11$ ). Although these determinants did not align with the constructs outlined by Damschroder [11], they provided valuable insights. For instance, Latino MSM, when compared with non-Hispanic White MSM, placed a higher emphasis on having access to free sexual health care, receiving support or counseling regarding their sex life, accessing text-based support, and obtaining group adherence support while on PrEP. Lastly, a study conducted with Latino MSM recruited from an HIV clinic in Texas revealed that those who were already on PrEP reported a higher level of willingness to undergo HIV tests and laboratory tests every three months compared to their counterparts who were not on PrEP [26].

#### **Outer setting**

Sociocultural, political, and environmental factors are known as *Outer Setting* determinants. It is worth noting

that no studies have identified determinants specifically related to *Critical Incidents*, such as natural disasters or mass shortages of supplies, or societal pressure, such as mass media campaigns or advocacy groups. However, it is important to consider that most studies were conducted prior to the COVID-19 pandemic.

Among the various constructs examined in the *Outer Setting*, only 23 out of 38 were identified as relevant to Latino MSM (Table 1). Notably, 11 of these factors (47.8%) were associated with *Local Attitudes*, encompassing sociocultural values and beliefs. For instance, Latino MSM showed a higher likelihood of expressing concerns related to stigma linked to PrEP usage. These concerns included worries about others noticing their pill intake and inquiring about it, or assuming they are HIV-positive based on observing them taking medication [27]. Additionally, Latino MSM also faced challenges specific to healthcare providers in their area lacking familiarity

with PrEP. Consequently, they were apprehensive about potential judgment when requesting PrEP [27].

When considering the construct of *Local Attitudes*, determinants can also include values related to gender norms and behavior. Certain determinants were measured to understand how gender roles can impact the adoption of PrEP. For instance, a study conducted among 151 HIV-negative/unknown Latino MSM in San Diego, California, revealed that individuals with high levels of traditional machismo (characterized by hypermasculinity, dominance, and aggression) had lower odds of PrEP awareness, willingness, and adherence. On the other hand, those exhibiting caballerismo (marked by chivalry, strong familial ties, and emotional connectedness) had greater odds of PrEP awareness, willingness, use, and adherence [28].

In the *Outer Setting* domain, equitable access to PrEP is influenced by several factors, with *Structural/Syndemic Oppression* being a key construct. These factors encompass societal structures and policies that perpetuate inequalities by unevenly distributing opportunities and resources. For instance, a study conducted with a large sample of staff providing PrEP to marginalized youth, predominantly Latino MSM, highlighted that mistrust in healthcare systems emerged as a significant barrier to PrEP utilization [29]. Another study also noted that Latino youth often feel invisible and marginalized within the healthcare system [30]. Another study in Texas found that trust in the government providing a pill for preventing HIV transmission was divided among Latinos. Approximately 50.6% reported a lack of trust in the government's ability to offer such medication, while 47.4% expressed reluctance towards government experimentation with new medications like PrEP. Interestingly, Latino MSM who were unaware of PrEP displayed higher levels of mistrust towards the government compared to those who were aware of PrEP but not currently using it [26].

### **Inner setting**

The determinants related to the *Inner Setting*, which refers to the specific context of PrEP delivery, has been less represented in the studies reviewed compared to the determinants of the *Outer Setting* and *Innovation Characteristics* domains. Out of the six determinants mentioning Latino MSM, only three of them specifically measured determinants of PrEP for Latino MSM. These determinants were identified in a study that focused on connecting MSM to prevention services in 12 U.S. cities. These were related to *Available Resources* to implement and deliver PrEP [25]. The study revealed that there is a lack of staff skills and time to guide Latino MSM through initiating PrEP, as well as a shortage of additional

resources they may require, such as additional testing for STIs or social services.

Among the remaining three determinants, a qualitative study conducted by Arnold et al. [29] explored provider perspectives on implementing PrEP in clinical settings. While mentioning Latino MSM, the study did not specifically focus on this group. Providers in this study expressed that current models of care may not be well-suited for prescribing PrEP, particularly in Black and Latino communities [25]. This barrier relates to the concept of *Compatibility*—the extent to which PrEP integrates with existing workflows, systems, and processes [29].

Finally, a study conducted among 3301 youths, including Black and Latino MSM who underwent HIV testing, found that combination strategies involving both targeted and universal screening were more effective than universal strategies alone in connecting at-risk HIV-negative youths to prevention services, such as PrEP [31]. Targeted screening played a crucial role in this success. As mentioned earlier, although these factors were not exclusively focused on Latino MSM, as they either involved a smaller group of Latinos or were derived from studies that referenced Latinos only, they still offer insight into the determinants influencing the implementation of PrEP and should be considered further.

### **Individuals**

Among Latino MSM, there was a common lack of knowledge regarding the process of obtaining a PrEP prescription, particularly among young individuals [26, 29–31]. Furthermore, a study found that Latino MSM between the ages of 18 and 29 were significantly more likely to view discussing their sex life with their doctor as a barrier to seeking PrEP [32]. Interestingly, within the same study, Latino MSM also expressed a lower desire for agency in participating in medical decisions, making it challenging for them to discuss PrEP with their doctor. In one study, many participants lacked confidence in their ability or desire to adhere to a daily pill regimen, with adherence being a greater concern for Latino MSM compared to non-Hispanic, White MSM [33].

Most determinants focused on individuals' *Motivation*, which encompassed both automatic (emotions and impulses arising from associative learning and innate dispositions) and reflexive motivations (evaluations and plans). A study involving 139 Latinos across various PrEP demonstration projects examined PrEP engagement, measured by visit attendance and adherence [34]. The findings revealed that PrEP interruptions were primarily driven by participant preference, including experienced side effects, concerns about long-term effects, and low self-perceived HIV risk [34]. Furthermore, Latino MSM



using PrEP reported significant benefits, such as reduced fear, anxiety, and stress associated with HIV, HIV testing, and sexual encounters. Among the participants, PrEP helped alleviate the persistent fear of contracting HIV, even among those who reported consistent condom use prior to initiating PrEP [34].

Fewer factors were found to be associated with the perceived physical and social *Opportunities* for recipients. Among them, a study of 131 Latino MSM revealed that being located within one mile of Spanish-language PrEP navigation services significantly increased the use of PrEP compared to those with limited access to Spanish PrEP navigation services [34]. Another barrier to PrEP uptake among Latino MSM was the difficulty in accessing existing sexual health services, which was compounded by participants' competing work obligations. Many participants reported working informal job positions where payment was contingent on work attendance, making it challenging to obtain permission to take time off to visit a clinic [34]. Furthermore, in a separate study involving Latino MSM, limited transportation to clinics offering PrEP was identified as an additional barrier within this context [26].

Commonly identified *Characteristics not Otherwise Associated with Behavior* included documentation status, language, education, age, and relationship status as proxies for larger structural issues of racism and classism [26, 35–37]. Some studies highlighted the impact of documentation status and limited English language proficiency on PrEP usage among Latino MSM [36, 37]. For instance, Latino MSM who were not born in the U.S. were less inclined to use PrEP compared to their U.S.-born counterparts [37]. Additionally, participants' immigration status posed challenges in accessing PrEP-related services, leading to limited engagement in the PrEP cascade [35, 37]. The study conducted in South Florida revealed that Latino MSM who were less engaged in PrEP reported experiencing greater stigma, discrimination based on income, financial stress, and negative past experiences with PrEP [34]. Furthermore, participants noted that the influence of religion and family, which hold significant importance in Latino culture, further exacerbates the challenge of overcoming anti-gay stigma [36].

### Change methods

In our comprehensive review on change methods [14], we analyzed 23 articles. Surprisingly, only two of these articles focused on implementation strategies and/or adjunctive interventions within the Latino MSM community. We expanded our search by identifying two more articles through citation searching and by utilizing Google Scholar for forward citations. These additional articles were subsequently included in our scoping review.

Table 2 provides a comprehensive summary of the articles included in our scoping review. It outlines the ERIC taxonomy domain and associated code for each *change method*, study design, and implementation outcomes.

In a pilot study conducted by Lopez et al. [40], a multicomponent implementation strategy called the Collaborative Practice Agreement (CPA) was evaluated. The objective of the study was to assess the effectiveness of CPA in supporting PrEP efficacy and promoting medication adherence. The CPA enables pharmacists to perform expanded functions to support patient care under the supervision of a physician. It encompasses partnerships, program leadership, defined activities, and responsibilities for pharmacists involved in delivering PrEP. Key partners contribute throughout all stages. The CPA also includes training to enhance and sustain the program staff's ability to implement PrEP, covering education on PrEP and technical aspects of delivering PrEP. Efforts were also made to establish streamlined workflow systems and environments that facilitate the implementation of PrEP. Table 2 reports the respective ERIC domains associated with these strategies. The article focused on one specific implementation outcome, which was the utilization of PrEP. The results indicated that out of the 53 patients, including 24 (47%) Latino MSM and 5 (10%) Black MSM, who completed a PrEP initiation visit, 51 successfully obtained a PrEP prescription. This suggests that the strategy employed was effective in reaching Latino MSM and other vulnerable populations [40]. Although additional implementation outcomes were collected, such as evaluating the strategy and assessing PrEP adherence, these results have not yet been published.

Hosek and colleagues [38] conducted a pilot study on the modification and integration of Adapted Many Men Many Voices (3MV), an evidence-based group-level adjunctive intervention for young MSM. Their sample primarily consisted of Black/African American (53%) and Latino (40%) MSM. The pilot program of 3MV explored HIV risk within the context of dual identity for Black and Latino MSM, considering their experiences as both racial and sexual minorities. This intervention drew from two established behavioral change theories: Social Cognitive Theory [42] and the Trans-Theoretical Model [43]. The study assessed the implementation outcomes of PrEP acceptability, fidelity, and adherence [40]. Consumer engagement strategies employed *advisory boards and workgroups*, which involved formal groups of diverse stakeholders giving input and advice on implementation efforts and offering recommendations for improvement. Additionally, an *implementation advisor* was consulted to seek guidance from implementation experts. Furthermore, *interventions were devised to enhance uptake and adherence by engaging patients in adjunctive interventions*

**Table 2** Latino MSM change methods

Author and Year	Change Method Name	Change Method Type	Unique ERIC Domains	Study Design	Patient Level Outcomes	Provider Level Outcomes
Hosek et al. 2013 [38]	Adapted Many Men Many Voices (3MV)	Adjunctive Intervention	<b>(4) Develop Stakeholder Interrelationships</b> (4.10) Use Advisory Boards and Workgroups (4.11) Use an Implementation Advisor <b>(7) Engage Consumers</b> (7.2) Intervene with Patients/Consumers to Enhance Uptake and Adherence	Test/Trial Change Methods	Strategy Acceptability, Appropriateness, Feasibility	Strategy Fidelity
Liu et al. 2019 [39]	PrEPmate	Adjunctive Intervention	<b>(7) Engage Consumers</b> (7.2) Intervene with Patients/Consumers to Enhance Uptake and Adherence (7.3) Prepare Patients/Consumers to be Active Participants (7.5) Use Mass Media	Pilot Change Methods	PrEP Adherence, Reach; Strategy Acceptability, Appropriateness, Feasibility	N/A
Lopez et al. 2020 [40]	Collaborative Practice Agreement (CPA)	Implementation Strategy	<b>(2) Provide Interactive Assistance</b> (2.3) Provide Clinical Supervision <b>(3) Adapt and Tailor to Context</b> (3.2) Tailor Strategies <b>(4) Develop Stakeholder Interrelationships</b> (4.2) Organize Clinician Implementation Team Meetings (4.5) Build a Coalition (4.10) Use Advisory Boards and Workgroups (4.15) Develop an Implementation Glossary (4.16) Develop Academic Partnerships	Pilot Change Methods	PrEP Uptake	N/A

**Table 2** (continued)

Author and Year	Change Method Name	Change Method Type	Unique ERIC Domains	Study Design	Patient Level Outcomes	Provider Level Outcomes
Martinez et al. 2023 [41]	Connecting Latinos en Pareja (CLP)	Adjunctive Intervention	<p><b>(4) Develop Stakeholder Interrelationships</b> (4.11) Use an Implementation Advisor</p> <p><b>(7) Engage Consumers</b> (7.2) Intervene with Patients/Consumers to Enhance Uptake and Adherence (7.3) Prepare Patients/Consumers to be Active Participants</p>	Test/Trial Change Methods	PrEP Uptake; Strategy Acceptability; Feasibility	N/A

aimed at encouraging adherence and problem-solving. Latino MSM expressed high acceptability for the group-based 3MV sessions, as well as the ongoing counseling and discussions on PrEP [40]. However, impact on implementation outcomes was mixed. Self-reported adherence averaged at 62% (ranging from 43 to 83%), while the rates of detectable tenofovir in participants' plasma ranged from 63.2% (at week 4) to 20% (at week 24) [40].

A third article examined an adjunctive intervention known as PrEPmate [39], which was utilized in a pilot study involving 43 Latino participants. PrEPmate is a comprehensive mobile health intervention grounded in the information, motivation, and behavioral (IMB) theory of behavior change [44] and developed through user-centered design. It utilizes SMS and interactive online content to enhance PrEP adherence among young MSM. The study evaluated various implementation outcomes, including strategy acceptability, appropriateness, and feasibility, as well as the overall acceptance of PrEPmate. Consumer engagement strategies involved *intervening with patients to enhance uptake and adherence, empowering patients to be active participants in their own care* by encouraging them to ask questions about care guidelines or the evidence behind clinical decisions and *using mass media* to spread the word about the clinical innovation to reach a larger audience [39]. The results demonstrated that Latino participants who received PrEPmate were more likely to attend study visits and had adherence levels consistent with taking at least 4 doses per week, compared to the control group. Moreover, the acceptability of PrEPmate was high, with 88% of participants reporting that it was very or somewhat helpful. Additionally, 83% expressed their desire to continue using PrEPmate after the study, and an overwhelming 92% would recommend it to others at week 36 [39].

Finally, Martinez and colleagues [41] conducted a comprehensive pilot study of Connecting Latinos en Parejas (CLP), an adjunctive intervention. This couple-based biobehavioral intervention focuses on Latino MSM couples ( $n=46$ ). Grounded in Social Cognitive Theory [42] and a relationship-oriented ecological framework [45], CLP aims to accurately assess risks, promote positive expectations for HIV protection strategies (such as PrEP), and establish and maintain supportive networks to encourage protected sexual behavior [41]. The study assessed various outcomes of implementation, including PrEP utilization, adherence, and the acceptability, appropriateness, and feasibility of strategies. To develop stakeholder interrelationships, *advisory boards and workgroups* were employed, involving a community advisory board that provided input and advice on implementation efforts. They also offered recommendations for improvement. Additionally, interventions were developed to *intervene with patients to enhance uptake and adherence* by actively involving and *preparing patients to be active participants in their own care*. Although the completion of the CLP intervention showed high feasibility and acceptability, the results regarding PrEP uptake were mixed. Only 11 (23.9%) participants reported using PrEP three months after completing CLP. However, qualitative findings suggest that many Latinos enrolled in CLP first learned about PrEP through the study [41].

## Discussion

Despite ongoing efforts at federal and state [5] levels to enhance access, awareness, and utilization of PrEP, considerable disparities persist in its usage among Latino MSM [2, 8]. Recent evidence from multiple studies indicates that only a small percentage, ranging from 12 to 20% of Latino MSM who could benefit from PrEP

actually utilize it [9, 44]. As the significance of implementation science in improving care delivery gains recognition [41, 45], our scoping review provides valuable insights into the determinants and change methods that impact the implementation of PrEP among Latino MSM. These insights have the potential to mitigate the existing PrEP disparities.

In this scoping review, we identified 43 articles that examined the factors influencing the implementation of PrEP by providers and its utilization by Latino MSM. These factors have been systematically categorized using an adapted version of the CFIR 2.0 framework [11], allowing for a comprehensive analysis of determinants across multiple levels. Through this analysis, we aim to identify areas for improvement and highlight aspects that require additional attention. Out of the 237 determinants examined, only 112 measured barriers and/or facilitators related to Latino MSM. The remaining determinants either briefly mentioned Latino MSM or had inadequate sample sizes for robust analysis. This methodological limitation was prevalent in many studies we reviewed, often grouping Latino, Black, and other racially and ethnically diverse MSM together. However, such aggregation is problematic, as previous research has demonstrated distinct HIV risk behavior patterns across different racial and ethnic MSM groups. For instance, first-generation Latino MSM are less likely to progress through the PrEP continuum of care due to challenges in navigating healthcare as non-U.S. citizens [46]. Additionally, extensive research shows that Latino MSM are less likely than non-Hispanic White MSM to seek social support from peers and family for PrEP adherence, even though such support effectively mitigates access barriers [4, 47]. These differences underscore the need for further research that distinctly categorizes racial and ethnic MSM to develop tailored interventions addressing the unique needs of these subpopulations. A second limitation identified in our review is the scarcity of articles that assessed *Process* determinants, possibly due to the conceptual overlap between implementation strategies and *Process* determinants. This is not surprising, as very few *Process* determinants were measured during the initial review that served as the foundation for this manuscript [18], a scoping review on determinants of PrEP implementation in transgender populations [20] and individuals who use drugs [48].

To enhance engagement, uptake, and retention in PrEP programs, adjunctive interventions are essential alongside implementation support. Latino MSM face multilevel barriers, including challenges navigating the healthcare system [4, 46], limited access to Spanish-speaking providers [18], competing social and economic demands [46], and individual-level obstacles affecting

their capability, opportunity, and motivation to use PrEP. In this study, we identified three key adjunctive interventions aimed at improving PrEP uptake: educational initiatives to bolster motivation for PrEP use [38, 39] and risk assessment coupled with risk-reduction counseling [41]. These interventions are vital, as Latino MSM, while being as aware of PrEP as other priority populations, are less likely to use it at scale [1–4]. Although these interventions show promise in increasing PrEP engagement, it is crucial to also employ implementation strategies targeting the providers and delivery systems involved in PrEP provision for Latino MSM. Providers who care for this population often report feeling unprepared or unsupported in delivering care due to limited time, complex patient issues, inadequate systems for monitoring and referring PrEP care, and a lack of cultural and linguistic training in providing care to Latino MSM [4].

Our review did not uncover implementation strategies addressing structural barriers (e.g., healthcare access). The CDC's Prevention Research Synthesis Compendium of Structural Interventions for HIV lists no effective structural interventions specifically for Latino MSM [49]. However, structural interventions like the Louisiana Public Health Institute's AIDS Initiative for Minority Men, which provides comprehensive services including health and social service navigation, case management, and housing coalitions for Black MSM, demonstrated significant outcomes: 62% of participants living with HIV were linked to care, 49% maintained viral suppression, and many gained employment and safe housing [50]. Such interventions should be considered for adaptation to support PrEP uptake, adherence, and use among Latino MSM [51]. Finally, such interventions will necessitate implementation strategies. Thus, such trials would benefit from hybrid implementation-effectiveness approaches to identify pre-implementation determinants, and identify strategies already embedded within settings that can be scaled up [52].

Consistent with the review of change methods aimed at enhancing PrEP implementation within delivery systems and increasing uptake and adherence [14], three out of the four identified studies were in the preliminary stages of evaluating these methods. This finding aligns with a recent review of NIH-funded HIV implementation projects, which revealed that most studies were still in the implementation preparation phase [46]. Notably, none of the studies in this review conducted hybrid effectiveness-implementation trials [52], which are designed to simultaneously evaluate the impact of implementation strategies and the effectiveness of PrEP. To advance the field, future projects should employ more rigorous study designs such as RCT implementation trials, head-to-head comparisons, and/or roll-out implementation

optimization trials. These should aim to determine the best approaches for increasing the reach, adoption, and sustainability of PrEP among Latino MSM through systemic changes. The review indicates that change methods targeting providers and the systems offering PrEP are particularly promising and worthy of evaluation in hybrid trials. This is particularly relevant when PrEP services are integrated within non-traditional settings, such as pharmacies [35], which may be more accessible to Latino MSM compared to other healthcare settings [3]. Additionally, our review identified *Local Attitudes within the Outer Setting* as a facilitator across several studies, consistent with past research on PrEP use among Latino MSM [3] and a recent study exploring attitudes around peer navigation to support PrEP use among this group [47]. Future hybrid trials should consider evaluating change methods at the recipient level, such as increasing PrEP awareness among the support networks of Latino MSM to improve uptake.

#### Limitations and future directions

Our sampling methods reflect the scope of our review. However, we may have overlooked some studies that met our inclusion criteria. Additionally, our criteria for determining whether studies had a sufficiently large sample size of Latino MSM or clearly reported results by racial/ethnic identity might have excluded studies with potential relevance to our review. Despite this, we prioritized literature specifically pertinent to Latino MSM due to the generally poor sampling and reporting of racial/ethnic identity in research. Furthermore, our search was restricted to peer-reviewed articles, thereby excluding grey literature. Our review criteria may not have captured studies specifically focused on Latino migrants and recent immigrants, as our primary focus was on Latino MSM in the U.S. This limitation is significant, considering that Latino MSM along the U.S.-Mexico border report poorer HIV clinical outcomes compared to other subgroups of Latino MSM [48, 49]. Although our team adjusted the *systemic/structural* aspect in the *Outer Setting* to address significant barriers and facilitators at the patient level, its effectiveness was limited due to the lack of reported variables related to migration, such as country of origin, length of time in the U.S., or language preferences among Latino MSM. CFIR was not designed to capture innovation determinants [11], and we were unable to find a framework that adequately captured recipient-level factors, which accounted for many determinants in our review due to the field's focus on PrEP users rather than implementers and the delivery system. Regarding change method coding, our coding was limited to what was available in the text. Future research on change methods should describe the methods more

carefully by specifying components in line with reporting recommendations [24]. Additionally, we encourage researchers to use tools that link and test causal pathways between the change methods and their putative change mechanisms, determinants, and/or outcomes, such as the Implementation Research Logic Model [53]. Doing so will allow for more seamless data synthesis in future systematic reviews.

#### Conclusion

To effectively combat the HIV epidemic in the U.S., it is crucial to develop targeted *change methods* for Latino MSM. Generic approaches alone are insufficient in addressing the specific challenges they face. The increased federal HIV funding connected to EHE plays a vital role in supporting prevention, testing, and treatment programs. Additionally, it enables research into innovative *implementation strategies* that have already shown promise in effectively addressing the needs of Latino MSM. Our review reveals that PrEP implementation barriers for this demographic are complex and multifaceted. Collaborative efforts among programs are necessary to mitigate these diverse obstacles, ranging from cost concerns to transportation issues. It is evident that culturally tailored *change methods* aimed at reducing these barriers for Latino MSM are currently lacking. By tailoring our approaches and prioritizing targeted interventions, we can make significant progress towards ending the HIV epidemic among Latino MSM in the U.S.

#### Abbreviations

HIV	Human Immunodeficiency Virus
EHE	Ending the HIV Epidemic
PrEP	Pre-Exposure Prophylaxis
MSM	Men who Have Sex with Men
CFIR	Consolidated Framework for Implementation Research
COM-B	Capability, Opportunity, Motivation Behavior Change System
ERIC	Expert Recommendations for Implementing Change

#### Supplementary Information

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Supplementary Material 1.

Supplementary Material 2.

#### Authors' contributions

JPZ, NB, and BM conceived of the paper. JPZ and AZ conducted the search, provided coder training, analyzed and summarized the data and wrote sections of the paper. AZ and JM developed the qualitative codebook. JPZ, AZ, AQ, and JLM coded studies and contributed to sections of the paper. All authors contributed to writing and approved the final manuscript.

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#### Availability of data and materials

We included a supplemental file of our codebook, which includes operational definitions of codes. The systematic review dashboard, which a portion of our studies were drawn from is freely available at <https://hivimpsi.northwestern.edu/dashboard/>. Additional data is available from the authors upon request.

#### Declarations

##### Ethics approval and consent to participate

This research involved searching previously published literature and did not involve human subjects; not applicable.

##### Consent for publication

Not applicable.

##### Competing interests

The authors have no relevant financial or non-financial interests to disclose.

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