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ORIGINAL PAPER

Factors Influencing Engagement Across the Motivational PrEP Cascade Among Latino SMM: A Mixed-Methods Analysis from the Perspectives of Community Providers and Latino SMM

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Abstract

Latino sexual minority men (SMM) are a highly vulnerable population to HIV, and while pre-exposure prophylaxis (PrEP) has emerged as a promising biomedical tool for HIV prevention among them, its utilization remains disproportionately low in this community despite its potential. Understanding the barriers along the PrEP continuum of care, known as the "PrEP cascade," is crucial for effectively implementing PrEP interventions. Therefore, the objective of our study was twofold: first, to explore the stage of Latino SMM in the PrEP cascade by examining disparities in demographics, social factors, and healthcare aspects; second, to gain insights from healthcare providers who have direct clinical experience with our population regarding the challenges faced by Latino SMM in accessing and adhering to PrEP. Based on the study findings, the majority of participants ($n = 74$; 49%) were in the *contemplation* stage, and only one in ten Latino SMM (10.6%) were currently adherent to PrEP. Compared to those who were at least second-generation, first-generation status had a positive association (B = 0.699, SE = 0.208, β = 0.351, $p < .001$) with engagement along the PrEP Contemplation Ladder. Conversely, having at least one parent who did not have legal residency, relative to those whose parents were both U.S. citizens or held legal residency documentation, was found to have a negative association (B = −0.689, SE = 0.245, β = 0.245, $p = .006$) with engagement along the PrEP Contemplation Ladder. Additionally, discussing PrEP with a healthcare provider had a positive association (B = 0.374, SE = 0.179, β = 0.185, $p = .038$) with engagement along the PrEP Contemplation Ladder. Qualitative results from our study suggest that some Latinos who initially agreed to start using PrEP ended up getting lost in the care pipeline and failed to attend their scheduled appointments. Providers also noted that many patients lacked access to a pharmacy where they felt comfortable obtaining their PrEP prescription, leading them to discontinue use after only a few months. These findings emphasize the importance of considering the unique needs, culture, and background of Latinos, including care delivery and provider attitudes that can facilitate progress through the PrEP cascade.

Keywords Latino · Sexual Minority Men · Men who Have Sex with Men · PrEP · HIV · PrEP Cascade

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Introduction

Despite advancements in biomedical prevention and treatment, HIV remains a significant public health concern for Latino/Hispanic sexual minority men (SMM). In 2020, Latino SMM accounted for 29% of new HIV diagnoses among SMM in the United States, second only to Black SMM, who also face distressing disparities [1]. With current estimates of infection among Latino SMM, the CDC projects that 1 in 4 will test positive for HIV in their lifetime, compared to 1 in 11 among non-Hispanic White SMM [2].

Pre-exposure prophylaxis (PrEP) marks a major biomedical milestone in the fight against HIV [3]. Despite significant progress in its deployment, PrEP adoption among Latino SMM remains notably lower compared to their non-Hispanic White counterparts [4–6]. Recent data shows that only 12–21% of Latino SMM report using PrEP, whereas non-Hispanic White SMM account for 65% of its users [7, 8]. Yet, previous research has shown that, once having access to PrEP, Latino SMM are more likely to use it compared to non-Hispanic White SMM [10, 11]. Nevertheless, in addition to lower usage rates, Latino SMM face greater challenges in adhering to PrEP [5–6; 10]. Existing research on PrEP in the U.S. has primarily focused on healthcare system challenges, limited awareness among providers, and negative perceptions held by patients and communities [9]. However, there is a dearth of knowledge regarding the demographic and social factors that may impede PrEP adoption among Latino SMM, such as nativity status or familial relationship(s), which are crucial to effectively reach this population and facilitate PrEP uptake [10]. Attention to differences between U.S.- born and foreign-born Latino SMM, for example, is important as the latter may face extra hurdles in accessing PrEP services, like lack of health insurance or transportation [10]. .

The PrEP Continuum of Care, often referred to as the PrEP cascade, was developed to delineate the essential steps and criteria necessary for the effective and sustained use of PrEP [11, 12]. Drawing from the transtheoretical model of behavioral change, the PrEP cascade outlines a sequence of stages: (1) recognizing one's risk of HIV infection; (2) gaining knowledge about PrEP and determining personal eligibility and willingness to use PrEP; (3) engaging in discussions about PrEP with a healthcare provider; (4) obtaining a prescription for PrEP; and (5) procuring and consistently adhering to PrEP. This includes regular STI and HIV testing, as well as monitoring for side effects. Despite earlier studies [13–15] identifying specific obstacles and challenges at various stages of the PrEP cascade, there is still a lack of knowledge regarding the progression of Latino SMM through the PrEP cascade and the influence of social and demographic factors on this advancement.

Multiple studies [9, 10] have identified reasons for the low uptake of PrEP use among Latino SMM, encompassing a range of intrapersonal, interpersonal, community, and structural barriers [10]. Individual barriers include a lack of awareness about HIV preventive healthcare and available services, apprehension towards medical treatments, financial hurdles, and language barriers at home [9, 10]. Research at the interpersonal level has primarily concentrated on societal acceptance, particularly family opinions regarding the use of PrEP [14]. Community-level challenges involve insufficient community engagement with PrEP, geographical variations in PrEP resources, and healthcare providers' reluctance to serve Latino populations [10, 15]. Furthermore, structural barriers have been highlighted, such as limited access to health insurance and stigma around PrEP use, which have been linked to discontinuation, poor adherence, and decreased willingness to use PrEP among Latino SMM [9, 10, 16]. Although these studies have enhanced our understanding of the barriers to PrEP engagement among Latino SMM, they fall short in precisely evaluating the social and demographic factors influencing engagement throughout the PrEP cascade. For instance, there's a notable absence of in-depth analysis on how social and demographic elements affect Latinos interested in PrEP who lack a healthcare provider, or those with access to a provider but do not consider themselves eligible for PrEP. This gap in specificity hinders the development of targeted public health strategies [9].

A limited number of studies have explored how demographic and social factors influence the various stages of the PrEP cascade in Latino SMM [14]. For example, one study found a significant association between higher levels of medical mistrust among Latino SMM and reduced likelihood of PrEP awareness, willingness to use PrEP, actual PrEP usage, and adherence to PrEP [16]. Another study investigated how psychosocial (e.g., depression, binge drinking, marijuana use) and structural (e.g., poverty, unstable housing, incarceration) syndemic factors impact the PrEP cascade among Latino SMM. It found that while structural barriers mainly hinder awareness of PrEP, psychosocial factors become more significant in influencing adherence levels once PrEP is initiated [17]. However, these studies overlooked critical demographic variables among Latino SMM, such as nativity or generational status [10], which limits the relevance of their findings for different subgroups within the U.S. This oversight is significant because previous research has indicated that the prevalence of sexual intercourse varies across immigrant generations [18, 19]. Specifically, first-generation individuals report the lowest rates of sexual intercourse and the latest age of sexual initiation, in contrast to second-generation native-born Latinos, who exhibit the highest levels of risk behavior [19]. Moreover, the viewpoints of providers working with Latino

SSM have not been adequately explored. Delving into these perspectives can lead to the development of effective strategies for enhancing progression through the PrEP cascade [20]. This aspect is crucial, particularly for providers assisting Latino SMM who may have varying immigration statuses or legal standings in the U.S. The delicate nature of these identities, which significantly impact their lives, poses challenges for researchers attempting direct engagement with this group [21]. Consequently, insights from providers who have established trust with this demographic could offer invaluable context, shedding light on how diverse demographic and social identities affect PrEP engagement.

Thus, the goal of this study is to investigate how various, previously unexplored, demographic, and social factors among Latino SMM relate to the PrEP cascade. Recognizing that Latino SMM may have unique needs and concerns regarding the PrEP cascade, this research aims to bridge a significant gap in existing literature for this high-risk group. Furthermore, the study seeks to understand the obstacles Latino SMM encounter in navigating the PrEP cascade by conducting qualitative interviews with providers working with Latino SMM. This approach will complement our quantitative data, providing a nuanced understanding of how these factors influence engagement across the PrEP Cascade, thereby enhancing the overall findings.

Methods

Participants

Latino SMM were recruited from a Community Health Clinic in Milwaukee, WI, between December 2020 and November 2021 to participate in a cross-sectional survey. This clinic has strong ties to the Latino community, providing care to approximately 43,000 patients in 2019. Among all patients, 86% identified as Latino; within this group, 70% primarily spoke Spanish. To be eligible for participation, individuals had to meet the following criteria: (a) be between the ages of 18–55, (b) possess literacy skills in English and/or Spanish, (c) identify as a cisgender Latino male, (d) reporting at least one act of condomless anal sex (CAS) with a male partner in the prior sex months, and (e) receipt of an HIV-negative test result from a study site or remote HIV self-testing. The criteria were set beforehand in collaboration with the clinic manager, who revealed that a small number of patients were over the age of 55. Consequently, we established this age cutoff to minimize outliers among the participants likely to respond. Once individuals met the screening criteria, they were invited to participate. Participants were instructed to complete a computer-assisted survey (Qualtrics) in Spanish or English, based on their language preference. All participants provided informed consent, were compensated with a $10 gift card, and entered a drawing to win one of five additional $40 gift cards. All study questions underwent thorough validation and translation, including back-translation between English and Spanish [22]. After being translated into each language, they were reviewed by the community clinic manager for further edits to ensure accuracy and cultural sensitivity.

Concurrently, providers at the clinic who worked with Latino SMM across their care were purposively sampled to participate in semi-structured interviews with the first author. As described elsewhere [23], participants had to be at least 21 years old—meeting their employer's age requirement for attending events limited to individuals 21 and older—and have experience in clinical or community settings with Latinos. A minimum of one year's experience was established as a criterion, agreed upon by the research team and the clinic, to guarantee participants had practical experience with this demographic. No other exclusion criteria were applied. Each semi-structured interview lasted between 30 and 90 min and was conducted in English, Spanish, or a combination of both, depending on the preference of the community provider. Interviews were deployed using a semi-structured interview guide developed collectively with the participating clinic's leadership. The guide included a set of questions and prompts aimed at assessing how Latinos in their care navigate the process of initiating clinical HIV prevention services and adhering to their treatment and scheduled appointments. All participants provided informed consent; all providers volunteered to participate without honoraria. All study procedures were approved by the Institutional Review Board (IRB) at [Blinded for Review].

Measures

Demographics Participants were requested to provide select demographic details, including age, openness to family regarding sexual orientation, participation in religious activities, relationship status, urbanity, nativity, living situation, household income, and sexual orientation.

Immigrant Status Participants were inquired about their and their parents' birthplace, specifically if they were born in the U.S. This led to the categorization into two distinct groups: those born outside the U.S. were designated as first-generation immigrants, while those born in the U.S. with at least one parent born abroad were identified as second-generation or later immigrants. Participants were then asked a series of questions aimed at determining the legal status of their parent(s) at the time of the survey. The initial query focused on whether any of the participant's parents were naturalized

U.S. citizens. If not, the questions progressed to inquire if the parents held a green card or legal permanent residency. Subsequently, participants whose parents were neither U.S. citizens nor green card holders were asked about the possession of refugee, asylee, or temporary protected status by their parents. In the absence of these statuses, the final question sought to establish if they had a valid visa for temporary residence in the U.S. This line of questioning was designed to distinguish between immigrants who were authorized (either as U.S. citizens or legal residents) and those who were unauthorized or undocumented to reside in the U.S. Based on prior research, immigrants lacking naturalization, permanent residency, refugee/asylee status, or a valid visa were classified as undocumented [24, 25]. To ensure the confidentiality of their responses, participants were assured that their data would be anonymized to guarantee their complete privacy and safety. For those uncomfortable with answering these inquiries, there was an option to skip to the next section or choose a "prefer not to respond" alternative.

HIV Risk Participants were instructed to disclose their total number of lifetime anal sex partners, including those with whom they had condomless sex. Only those reporting experiences of condomless anal sex were selected for our study, meeting our eligibility criteria. Additionally, we gauged participants' perceptions of their HIV risk using a Likert scale, categorizing responses into high risk, low risk, not at risk, and unsure. Due to the minimal number of participants choosing 'unsure' (n = 3), we combined 'not at risk' and 'unsure' into a single category, thereby streamlining our analysis into three distinct risk perception categories.

PrEP Awareness and Use Subsequently, participants were presented with a concise description of pre-exposure prophylaxis (PrEP): "PrEP is a medication that helps prevent HIV. It involves HIV-negative individuals taking a pill once daily to reduce the risk of contracting HIV if exposed to the virus. Those on PrEP are required to visit a healthcare provider every three months for HIV/STI testing, bloodwork, and to renew their PrEP prescription." After providing this definition, participants were asked a series of closed-ended questions to assess their familiarity with, interest in, and barriers to PrEP. Specifically, participants were asked if they had ever used PrEP if they had heard of PrEP before the survey, and if they were aware of it, where they acquired this knowledge.

PrEP Contemplation Ladder To assess the position of Latino SMM along the PrEP Cascade, we utilized the PrEP Contemplation Ladder [13]. This tool required participants to choose from 10 options, correlating to five distinct stages of the PrEP cascade, each representing a different level of readiness and engagement with PrEP. These stages include: Pre-contemplation, where individuals see no need or have no interest in starting PrEP (e.g., "I will never need PrEP" or "I have no intention of starting it"); Contemplation, indicating openness to PrEP but with reservations about eligibility or plans to start (e.g., "I'm open to PrEP but don't consider myself a good candidate" or "I think I'm a good candidate but have no plans to start"); Preparation, showing a definite plan to start PrEP but without taking initial steps or having obtained a prescription (e.g., "I plan to start PrEP but haven't taken steps" or "I've discussed starting PrEP with a doctor but don't have a prescription yet"); Action and initiation, where individuals have taken steps towards PrEP use but face challenges in consistent usage or accessing regular HIV/STI testing as recommended (e.g., "I've got a PrEP prescription but filling it is challenging" or "I'm using PrEP but struggle with daily adherence and regular testing"); Maintenance, denoting consistent daily PrEP use with a commitment to regular HIV/STI testing and provider check-ups every three months, as recommended (e.g., "I take PrEP daily and adhere to regular testing and check-ups"). The PrEP Contemplation Ladder has demonstrated strong construct validity among a sample of gay and bisexual men (John et al., 2019), showing favorable completion rates when compared to lengthier, PrEP Cascade questionnaires. The measure underwent translation from Spanish to English, adhering to established standards and ethical practices for translating measures into different languages from their original development [22].

Quantitative Data Analysis

Throughout the survey, several attention checks were implemented to ensure high-quality data collection [26–28]. The gathered data underwent scrutiny to evaluate completion, instructional manipulation, and attentional checks. Out of the 238 responses collected, 76 were omitted because they were incomplete, and another 11 were disregarded for their inconsistency. The excluded 76 responses were those that provided only minimal demographic details and failed to complete the sections specific to PrEP and HIV. As a result, the study reported a sample size of $n = 151$, which was then subjected to analysis. Before conducting the primary analyses, the main variables of interest were examined to ensure data accuracy and meet the assumptions for regression analysis. The results indicated that all variables were approximately normally distributed, as determined by assessing the skewness and kurtosis of each measure. The assumption of linearity was assessed using within-group scatterplots, which revealed likely linear relationships among all dependent variables. Each variable was transformed into its

z-score to identify univariate outliers, and values exceeding +/- 3.29 were considered potential outliers [27]. Additionally, the data was transformed to calculate a p-value using the Mahalanobis Distance for each observation to evaluate the presence of any multivariate outliers. No corrections were deemed necessary as each value exceeded 0.001 [28].

Descriptive statistics were reported using frequency measures. Bivariate associations and distributions were then examined through chi-square tests of independence or Fisher's Exact Test. Subsequently, multivariate relationships were explored using multiple linear regression analysis. The dependent variable (PrEP Contemplation Ladder) was standardized. The subgroup with the larger sample size was set as the reference group for each categorical predictor in the multiple linear regression. The aim of this paper was to explore the interplay of factors and their effect on the PrEP Contemplation Ladder; thus all variables of interest were entered into a multivariate linear regression to elucidate those consequences. We report our results with unstandardized, standardized, standard error values, 95% Confidence Intervals, and *p*-values ($\alpha = 0.05$). G*Power was used to perform an a power analysis for multiple linear regression analysis to determine a sufficient sample size [25]. For small to medium effect sizes (0.20 or greater), our analysis was well-powered (power = 0.80; $\alpha = 0.05$) given our sample size [29].

Qualitative Data Analysis

Guided by the tenets of inductive thematic analyses, it was expected that it would take 15–20 interviews to reach data saturation for individual interviews [30]. The 16th and 17th interview in this project corroborated the data from the previous interviews without presenting additional themes, suggesting saturation was achieved. This was determined using constant comparative methods [31–33]. The data coding and interpretation process was undertaken by a team including the primary researcher, a researcher with a PhD in Psychology, a peer debriefer holding a master's in public health, an auditor with a PhD in Developmental Psychology, and an independent coder who has a bachelor's in psychology. At the onset of the coding process, two bilingual, bicultural research team members, including the primary researcher and the peer debriefer, independently coded five transcripts to develop a preliminary codebook. The initial codes were developed based on the interview guide, interview memos, and categories specific to the Motivational PrEP Cascade [31]. Discrepancies were deliberated to achieve agreement on the application of the code, the adequacy of definitions, and the comprehensiveness of the codebook. This process was supervised by the auditor with experience in collaborating with community partners. To ensure quality assurance, the primary researcher and an independent coder independently coded two separate transcripts using the codebook. The interrater reliability, as measured by Cohen's kappa statistic [33], was high for the coded text, with an overall value of $K = 0.84$. Following this, both the independent coder and the primary researcher, who identify as Latino and as members of sexual minority groups, applied the codebook to each interview. They focused on initial codes that demonstrated considerable "analytical power" [34], either through their frequency or their significance.

Results

Quantitative Study Results

Latino SMM Demographics Table 1 provides a comprehensive sample overview, focusing on the explanatory variables and the outcome of interest. Nearly all participants (99.3%) identified as Hispanic or Latino, with only one identifying as bi-racial or mixed-race and Latino. Regarding living arrangements, most participants lived in urban areas (62.9%) and lived alone or with friends (82.8%). In terms of family income, a majority earned less than $50,000 per year (71.5%). This consisted of 52.3% reporting an income between $40,000 and $50,000 and 19.2% reporting an income below $40,000. Financial stress varied among participants, with less than one-third (28.5%) experiencing low financial stress, while over one-third reported moderate (36.4%) or high financial stress (35.1%). A significant proportion (82.8%) reported having a religious affiliation, with a majority engaging in religious services multiple times a year (78.8%). Furthermore, most participants were in committed relationships (56.3%) and had not disclosed their sexual orientation to their family (53.6%). Additionally, they identified as first-generation immigrants (51.0%) and had both parents with legal U.S. residency and/or citizenship (84.7%).

Next, we aimed to document the experiences of Latino SMM in sexual health care. The majority of participants had health insurance (58.3%) and had taken an HIV test at least once in their lives (74.2%). However, less than half reported having a primary care doctor (43.7%). In conversations with healthcare providers, less than half had discussed PrEP (41.1%), and even fewer had discussed HIV services (21.%) or sexual orientation (15.9%).

Descriptive Analysis of the PrEP Contemplation Ladder Participants were distributed across all stages of the PrEP Contemplation Ladder (refer to Table 1). A small number of participants were in the *precontemplation* stage (3.3%), while almost half were in the *contemplation* stage

Table 1 Participant demographic characteristics

Categorical Variable	*n*	%
Age Range		
18—24	28	18.5
25—34	107	70.9
35—44	16	10.6
Open to Family about Sexual Orientation		
Yes	70	46.4
No	81	53.6
Religious activity participation		
Several times a year	119	78.8
Never	32	21.2
Generation Status		
First Generation	77	51.0
Second Generation or higher	74	49.0
Parent Documentation Status		
Both are U.S. Citizens or Legal Residence	128	84.8
At least One or Both do not have Legal Residence	23	15.2
Relationship Status		
In a relationship	85	56.3
Single	66	43.7
Urbanity		
Urban	95	62.9
Rural or Suburban	56	37.1
Current Living Situation		
Alone or with friend(s)	125	82.8
With family	26	17.2
Income		
Less than $50k per year	108	71.5
$50k or more per year	43	28.5
HIV Risk		
High Risk	49	32.5
Low Risk	49	32.5
Not Considered at Risk	53	35.0
Has Primary Care Doctor		
Yes	66	43.7
No	85	56.3
Lifetime HIV test		
Yes	112	74.2
No	39	25.8
Discussed HIV Services w/ Provider		
Yes	33	21.9
No	118	78.1
Discussed Sexual Orientation w/ Provider		
Yes	24	15.9
No	127	84.1
Discussed PrEP w/ a Provider		
Yes	62	41.1
No	89	58.9
Motivational PrEP Cascade		
Pre-Contemplation	5	3.31
Contemplation	74	49.00
Preparation	36	23.84
Action and Initiation	20	13.24
Adherence and Use	16	10.60

Note. All the analyses utilized the full sample ($N = 151$). All subcategories per construct were mutually exclusive (i.e., only counted in a single subgroup)

(49.0%). Roughly a quarter were in the *preparation* stage (23.8%). However, only a small proportion were in the *action and initiation* stage (13.2%), and even fewer were in the *adherence and use* stage (10.6%).

Examining Bivariate Associations with the PrEP Contemplation Ladder Chi-square tests of Independence or Fisher's Exact Test were employed to examine participant characteristics and demographic information distribution across different stages of the PrEP Contemplation Ladder (see Table 2). The findings revealed statistically significant associations between the PrEP Contemplation Ladder and several factors: Generation status, relationship status, urbanity, income, HIV risk, lifetime HIV testing, and discussions about HIV services with healthcare providers. In the cross-tabulation of PrEP Contemplation Ladder stages and generation status, a higher proportion of Latino SMM in the *PrEP-aration, Action and Initiation*, and *Adherence and Use* stages identified as first-generation ($\chi2 = 17.32$, $p < .001$). Concerning relationship status, a notably larger proportion of individuals in these stages were single ($\chi2 = 18.39$, $p < .001$). Regarding urbanicity, those living in urban locations showed a higher likelihood of being in the *Adherence and Use* stage ($\chi2 = 13.18$, $p < .008$) compared to their counterparts in rural or suburban settings.

Unsurprisingly, individuals with an annual income of less than $50k were more likely to be in the earlier stages of the cascade, while those with an income of $50k or more per year were more likely to be in the later stages ($\chi2 = 14.00$, $p < .005$). Those who perceived themselves as having no or low risk for HIV were also more likely to be in the earlier stages of the cascade, whereas those who considered themselves at high risk for HIV were in the later stages ($\chi2 = 50.25$, $p < .001$). Finally, individuals who had undergone lifetime HIV testing were more likely to progress towards the later stages of the cascade ($\chi2 = 14.65$, $p < .003$), as well as those who had discussed HIV services with their provider ($\chi2 = 12.52$, $p < .010$) (Table 3).

Examining Multivariate Associations with the PrEP Contemplation Ladder The multiple linear regression resulted in a significant explanatory model ($F(17, 133) = 3.181$, $p < .001$, $R^2 = 0.289$, $R^2_{adj} = 0.198$; see Table 3). There were no issues with multicollinearity upon review of the variance inflation factor and tolerance values. This multivariate approach suggested that there was a significant association between the PrEP Contemplation Ladder and (1) generation status, (2) parent documentation status, and (3) discussing PrEP with a healthcare provider. Among Latino SMM participants, those of first-generation status were notably more engaged in the PrEP Contemplation Ladder compared to

Table 2 Participant demographic characteristics by stages of the PrEP contemplation ladder ($N = 151$)

	Pre-Contemplation *N* (%)	Contemplation *N* (%)	Preparation *N* (%)	Action and Initiation *N* (%)	Adherence and Use *N* (%)	χ^2	*p*-value
Age						12.18[a]	0.099
18–24 years old	0 (0.0)	18 (24.3)	6 (16.7)	0 (0.0)	4 (25.0)		
25–34 years old	5 (100.0)	49 (66.2)	23 (63.9)	19 (95.0)	11 (68.8)		
35–44 years old	0 (0.0)	7 (9.5)	7 (19.4)	1 (5.0)	1 (6.3)		
Open to Family About Sexual Orientation						6.76[a]	0.144
No	5 (100.0)	40 (54.1)	21 (58.3)	9 (45.0)	6 (37.5)		
Yes	0 (0.0)	34 (45.9)	15 (41.7)	11 (55.0)	10 (62.5)		
Religious Activity Participation						4.96[a]	0.264
Never	1 (20.0)	18 (24.3)	7 (19.4)	1 (5.0)	5 (31.3)		
Several Times A Year	4 (80.0)	56 (75.7)	29 (80.6)	19 (95.0)	11 (68.8)		
Generation Status						**17.32**[a]	**< 0.001**
First-generation	4 (80.0)	20 (27.0)	24 (66.7)	19 (95.0)	10 (62.5)		
At least second-generation	2 (20.0)	54 (73.0)	12 (33.3)	1 (5.0)	6 (37.5)		
Relationship Status						**18.39**[a]	**< 0.001**
Single	2 (40.0)	20 (27.0)	24 (66.7)	11 (55.0)	9 (56.3)		
In a relationship	3 (60.0)	54 (73.0)	12 (33.3)	9 (45.0)	7 (43.8)		
Parent Documentation Status						4.91[a]	0.264
At least one does not have legal residence	2 (40.0)	10 (13.5)	7 (19.4)	1 (5.0)	3 (18.8)		
Both are U.S. citizens or legal resident	3 (60.0)	64 (86.5)	29 (80.6)	19 (95.0)	13 (81.3)		
Urbanity						**13.18**[a]	**0.008**
Urban	2 (40.0)	55 (74.3)	18 (50.0)	8 (40.0)	12 (75.0)		
Rural or suburban	3 (60.0)	19 (25.7)	18 (50.0)	12 (60.0)	4 (25.0)		
Current Living Situation						1.05[a]	0.921
Living alone or with friends	5 (100.0)	62 (83.8)	29 (80.6)	16 (80.0)	13 (81.3)		
Living with family	0 (0.0)	12 (16.2)	7 (19.4)	4 (20.0)	3 (18.8)		
Income						**14.00**[a]	**0.005**
Less than $50k per year	5 (100.0)	51 (68.9)	32 (88.9)	9 (45.0)	11 (68.8)		
$50k or more per year	0 (0.0)	33 (31.1)	4 (11.1)	11 (55.0)	5 (31.3)		
HIV Risk						**50.25**[a]	**< 0.001**
Not considered at risk	2 (40.0)	21 (28.4)	20 (55.6)	6 (30.0)	4 (25.0)		
Low risk	1 (20.0)	41 (55.4)	1 (2.8)	1 (5.0)	5 (31.3)		
High risk	2 (40.0)	12 (16.2)	15 (41.7)	13 (65.0)	7 (43.8)		
Has Primary Care Doctor						3.63[a]	0.466
No	3 (60.0)	43 (58.1)	23 (63.9)	10 (50.0)	6 (37.5)		
Yes	2 (40.0)	31 (41.9)	13 (36.1)	10 (50.0)	10 (62.5)		
Lifetime HIV test						**12.52**[a]	**0.010**
No	2 (40.0)	12 (16.2)	14 (38.9)	9 (45.0)	2 (12.5)		
Yes	3 (60.0)	62 (83.8)	22 (61.1)	11 (55.0)	14 (87.5)		
Discussed HIV Services w/ Provider						**14.65**[a]	**0.003**
No	4 (80.0)	60 (81.1)	33 (91.7)	14 (70.0)	7 (43.8)		
Yes	1 (20.0)	14 (18.9)	3 (8.3)	6 (30.0)	9 (56.3)		
Discussed Sexual Orientation w/ Provider						3.735[a]	0.407
No	4 (80.0)	59 (79.7)	32 (88.9)	19 (95.0)	13 (81.3)		
Yes	1 (20.0)	15 (20.3)	4 (11.1)	1 (5.0)	3 (18.8)		
Discussed PrEP w/ Provider						5.27[a]	0.256
No	3 (60.0)	50 (67.6)	18 (50.0)	11 (55.0)	7 (43.8)		
Yes	2 (40.0)	24 (32.4)	18 (50.0)	9 (45.0)	9 (56.3)		

Note. Bold values denote statistical significance at the $p < .05$ level. The breakdown per PrEP Contemplation Ladder step is as follows: (1) Pre-contemplation $n = 5$, (2) Contemplation $n = 74$, (3) PrEP-aration $n = 36$, (4) Action and Initiation $n = 20$, and (5) Adherence and Use $n = 16$

[a] Denotes that the Fischer's Exact Test was utilized

Table 3 Multiple linear regression examining influences on the PrEP Contemplation Ladder in a sample of LASMM.

	PrEP Contemplation Ladder		
	β	**t-value**	**95% CI**
Age (25–34 years old ref.)			
18–24	0.057	0.68	-0.283, 0.578
35–44	-0.021	-0.23	-0.661, 0.524
Open to Family About Sexual Orientation (No ref.)			
Yes	0.002	0.02	-0.379, 0.387
Religious Activity Participation (Several times a year ref.)			
Never	-0.023	-0.22	-0.563, 0.449
Generation Status (At least second-generation ref.)			
First-generation	**0.351** ***	**3.36**	**0.287, 1.111**
Relationship Status (In a relationship ref.)			
Single	0.165	1.55	-0.091, 0.755
Parent Documentation Status (Both are U.S. citizens or legal residents ref.)			
At least one does not have legal residence	**-0.248** **	**-2.81**	**-0.091, 0.755**
Urbanity (Urban ref.)			
Rural or suburban	-0.060	-0.67	-0.485, 0.239
Current Living Situation (Living alone or with friends ref.)			
Living with family	-0.044	-0.55	-0.542, 0.307
Income (Less than $50k per year ref.)			
$50k or more per year	0.090	0.92	-0.230, 0.630
HIV risk (Not Considered at Risk ref.)			
Low Risk	0.802	0.87	-0.224, 0.573
High Risk	-0.126	-1.03	-0.780, 0.245
Has Primary Care Doctor (No ref.)			
Yes	0.121	1.21	-0.156, 0.642
Lifetime HIV Test (Yes ref.)			
No	-0.186	-1.85	-0.877, 0.030
Discussed HIV Services With Healthcare Provider (No ref.)			
Yes	0.125	1.51	-0.094, 0.698
Discussed Sexual Orientation With Healthcare Provider (No ref.)			
Yes	-0.104	-1.07	-0.810, 0.242
Discussed PrEP With Healthcare Provider (No ref.)			
Yes	**0.185** *	**2.09**	**0.020, 0.728**

Note. All the analyses utilized the full sample ($N = 151$). A sterisk symbols were used to indicate statistical significance as follows: *$p < .05$, **$p < .01$, ***$p < .001$. For ease of interpretation, significant associations were bolded. 95% CI refers to 95% Confidence Interval for Beta

individuals of at least second-generation status, showing a significant positive association (B = 0.699, SE = 0.208, β = 0.351, $p < .001$). Conversely, participants with at least one parent lacking legal residency documentation showed lower engagement in the PrEP Contemplation Ladder than those whose parents were either U.S. citizens or held legal residency, indicating a negative association (B = − 0.689, SE = 0.245, β = 0.245, $p = .006$). Additionally, discussions about PrEP with a healthcare provider were positively correlated (B = 0.374, SE = 0.179, β = 0.185, $p = .038$) with increased engagement in the PrEP Contemplation Ladder.

Table 4 Provider demographic information

Categorical Variables	*n*	%
Age Range		
18–24	1	5.5
25–34	6	33.3
35–44	3	16.7
45–54	7	35.3
55 +	1	5.5
Gender Identity		
Cisgender Man	5	27.8
Cisgender Female	10	55.5
Non-binary	3	16.7
Race/ethnicity		
Latinx or Hispanic	14	77.8
White, non-Hispanic	3	16.7
Multiracial/another	1	5.5
Born in the U.S.		
Yes	8	44.4
No	10	55.5
Country of origin		
Mexico	11	64.7
Continental U.S.	3	16.7
Puerto Rico	4	22.2
Education Level		
High school diploma or GED	1	5.5
Associate degree	3	16.7
Bachelor's degree	9	50.0
Graduate or professional degree	5	27.8
Role		
Social worker	3	16.7
Nurse	3	16.7
Administrative	2	11.1
Dietician	2	11.1
HIV/STI prevention specialist	7	35.3
Years of employment (current)		
1 to 3 years	5	27.8
4 to 6 years	2	11.1
7 to 10 years	2	11.1
11 to 20 years	3	16.7
20 + years	6	33.3

Note: Percentages may not add up to 100 due to rounding

Qualitative Study Results

Provider Demographics A total of eighteen providers participated, including eight HIV/STI prevention outreach specialists (44.4%), two dieticians (11.1%), three primary care nurses (16.7%), three community social workers (16.7%), and two administrative providers (11.1%). When it comes to the years of experience in their current positions, there was a wide range, spanning from 2 to 30 years. The majority of the sample identified as Hispanic/Latino (77.8%), followed by White (16.7%) and Bi-racial/Mixed-race (5.5%). Among the participants, 61.1% were born in Mexico ($n = 11$), 22.2% were born in Puerto Rico ($n = 4$), and 16.7% were born in the continental U.S ($n = 3$). For additional provider demographics, please refer to Table 4.

Qualitative Findings

We have identified five themes that relate to the progression of Latino SMM in the PrEP Contemplation Ladder: (1) *precontemplation*, (2) *contemplation*, (3) *Preparation*, (4) *action and initiation*, and (5) *maintenance*.

Regarding the initial stage, referred to as *precontemplation*, numerous healthcare providers engaged in discussions about the reasons why certain Latinos they encountered exhibited disinterest or reluctance in discussing PrEP. At this community clinic, many Latinos prioritize what providers referred to as more essential needs, such as housing or immigration support. Consequently, when approached about PrEP, some Latinos demonstrate little interest as it does not align with their immediate concerns. For example, a nurse with over ten years of experience working with Latinos shared, "*Even when I provide them with information on PrEP, their health often takes a backseat to other priorities in their lives*." Furthermore, healthcare providers have observed that a significant number of Latinos connected to their clinic lack proper documentation, and some are recent immigrants without a fixed address. Consequently, when approached about PrEP or HIV preventive services, many express disinterest due to concerns that their legal status would hinder their access to these services. However, it is important to highlight that upon receiving information about the benefits available to undocumented individuals at the clinic, many Latinos show interest and proceed to schedule appointments. A nurse emphasized, "*Misconceptions about the quality of care and resources available to undocumented individuals are so rampant, but a single trusted source providing accurate information can change their perception and engagement with PrEP, you know and that is our model*."

When discussing Latinos in the *contemplation* stage (i.e., those willing to take PrEP but not perceiving themselves as suitable candidates or having no immediate plans to start), providers talked about how the clinical guidelines for monitoring and testing posed as deterrents, discouraging many Latinos from further considering PrEP. One HIV prevention specialist expressed, "*Many Latinos who are open to using PrEP may have concerns about the associated costs of medication and testing. When I first started working in HIV prevention, I noticed that many people were unaware of programs that could assist them in obtaining medications. Although these medications are expensive, we can offer some support*." Providers also observed that despite recognizing the advantages of PrEP, some Latinos expressed hesitation due to the transient nature of their work as migrant

workers. This hindered the formulation of concrete plans to initiate PrEP among many Latino individuals at the clinic.

In the *preparation* stage, which refers to Latinos who are planning to start taking PrEP but have not discussed it with their doctor or obtained a prescription yet, providers have identified similar concerns and barriers that were observed in the *contemplation* stage. However, they have further elaborated on the fact that some Latinos who had initially agreed to start using PrEP ended up getting lost in the care pipeline and failed to attend their scheduled appointments with the PrEP-providing physician. One HIV prevention specialist pointed out, "*Our clinic system is unnecessarily complex and does not facilitate streamlined care. I would conduct outreach for PrEP and succeed in getting them interested in scheduling an appointment, but then they would be shuffled around. Even if they managed to secure an appointment for the following month or next week, they often failed to follow through*." Many non-medical providers, such as social workers, also discussed that some Latinos they encountered in their various roles expressed reluctance to have an appointment with a medical doctor, particularly if they had previously had negative experiences. As one social worker expressed, "*I believe that taking the next step to see a doctor has been intimidating for many of the people I work with, even if the doctor speaks Spanish. While we have excellent doctors at our clinic, I understand that some of them [*doctors] *are older and may appear to have more traditional views of sex, which explains why some of our patients are hesitant to see them at first. This is something I try to speak out on*." Finally, some providers have observed that their undocumented patients often show a heightened interest in using PrEP, recognizing its potential to safeguard their health. This, in turn, enables them to support their families both in the U.S. and back in their homeland. One social worker noted, "They just got here, right and are still eager to use every resource available to keep their health better." However, other pressing needs, such as securing employment and stable living conditions, often hinder their progress in accessing PrEP care.

During the *action and initiation* phase, which pertains to Latinos already on PrEP but facing challenges with daily adherence and attending follow-up appointments for HIV/STI screening, healthcare providers have identified distinct barriers related to their proximity to the clinic and work schedules. Many interviewees discussed that although their clinic is located in an urban setting, many of their patients live further away, in rural areas, due to the high cost of living. As a result, many Latinos who are on PrEP and live in a more rural area often cannot drive during traditional business hours to attend their screening appointments. Similarly, providers also noted that many of their patients often did not have access to a pharmacy in which they felt comfortable going for their PrEP prescription so that they would discontinue after only a few months. One nurse stated, "*For the people I work with who are 30 or 40 minutes away from our clinic and live in smaller towns, they generally do not have access to a pharmacy or are under the impression that there are no similar clinical opportunities for them in their towns since there are no Latino providers in their area*." Likewise, one administrative provider stated, "*They will get PrEP from us, but they live in less developed areas, so there is a huge issue of them going to nearby pharmacies or clinics to get their bloodwork done*." Moreover, many participants also raised concerns about the challenges faced by Latinos in terms of their employment, often characterized by low wages and a lack of benefits or flexibility to request time off. These circumstances make it difficult for them to schedule and attend follow-up appointments at the clinic. One HIV prevention specialist highlighted the issue, stating, "*I have clients who commute for an hour to work, making it impossible for them to come for testing during the day, especially since we usually close at 5 p.m*." Finally, participants emphasized that their clinic primarily serves individuals with limited resources who often live paycheck to paycheck. Many of these individuals struggle to remember taking their medication daily due to long working hours or prioritizing the care of their families, both locally and in their native countries. For example, one case worker stated, "*I would probably say that many of my clients forget to take PrEP because you know, daily life. If they are not meeting their basic requirements for living, something like remembering to take PrEP is not as important at the end of the day.*"

In the *maintenance* stage, focusing on adherent Latinos, the findings highlight the strategies providers employ to ensure and support consistent PrEP usage. Regardless of their job roles, participants discussed offering additional services and resources to assist clients in regular PrEP intake and follow-up appointments. For instance, providers often arranged transportation for their clients, sometimes by providing Uber waivers. One participant even mentioned providing clients with a letter to obtain their employers' permission to attend clinical appointments. Participants also mentioned that they go beyond PrEP-related activities to support their clients. This strengthens their connection and helps overcome barriers that could hinder adherence to PrEP. One participant highlighted, "*We ensure our patients receive assistance in any way possible. For instance, our team advocates for providing gift cards that can be used for various needs, such as paying cell phone bills.*" By offering these resources, providers have emphasized that the barriers to maintaining PrEP are less intense. This, in turn, enhances adherence and the likelihood of patients returning for ongoing care. Additionally, providers have acknowledged that a

crucial aspect of their role involves dispelling misconceptions regarding the benefits available to Latinos with different levels of documentation status or health insurance in terms of HIV prevention care. Once accurate information is provided, reaching this stage becomes more attainable.

Discussion

Our research aimed to assess the position of Latino SMM within the PrEP Cascade informed by the Transtheoretical Model of Change [12, 13]. Based on the study findings, the majority of participants (49%) were in the *contemplation* stage, and only one-in-ten (10.6%) Latino SMM were in the PrEP *maintenance* stage. Our findings align with previous studies that have examined the position of SMM in the PrEP cascade [13, 15, 17]. However, our study brings a unique contribution by exploring previously unexplored demographic variables, such as generation- and documentation- status among a clinic-based sample of Latino SMM. Moreover, our findings are supplemented by contextual insights from providers who have direct clinical experience working Latino SMM. Interviews reveal that while many Latinos might be open to using PrEP, their progression towards advanced stages of the cascade is hindered by differing health and livelihood priorities. Providers indicate that for most Latino clients, securing a stable job and reliable transportation are more pressing concerns, relegating PrEP/HIV prevention to a lower priority. However, providers also observed that when clinics can offer extra resources, such as travel reimbursements and additional healthcare services, Latino SMM show a greater willingness to utilize PrEP and advance to later stages of the cascade.

The findings of this study shed light on several promising avenues for future research. Our results demonstrate that almost all Latino individuals sampled were aware of PrEP, which aligns with previous research [6, 35]. Despite this awareness, our research shows that Latinos informed about PrEP face significant challenges in navigating the PrEP cascade, with obstacles stemming from a range of demographic, cultural, and structural factors [10, 14–37]. Notably, our study highlights the unique hurdles Latino SMM encounter in the PrEP cascade, often arising from a lack of knowledge about available resources. Healthcare providers report that many Latinos either do not know about the benefits for which they qualify or erroneously believe that their immigration status or absence of health insurance precludes them from accessing PrEP services. This discovery resonates with previous research pinpointing misinformation among Latinos as a major healthcare barrier [37], underlining the urgent need for future studies to spread correct information among Latinos across different situations. Such research should stress that, irrespective of legal, social, and economic backgrounds, there are programs designed to facilitate PrEP utilization [9, 10, 38].

Furthermore, our study shows that Latino SMM whose parents do not have legal residency are less likely to advance on the PrEP Contemplation Ladder compared to those with parents who are U.S. citizens or have legal residency. This study appears to be the first to explore how PrEP usage among Latino SMM is influenced by having parents of mixed legal statuses, including citizens, legal residents, and undocumented immigrants. While numerous factors influence the health outcomes of families with mixed legal status, it is suggested that health disparities in these groups stem from three main mechanisms: healthcare access, availability of health-supportive resources (including social, economic, and political factors), and the effects of immigration enforcement actions [38–44]. For example, current federal policies like California's Proposition 187, which sets up a citizenship screening program to prevent undocumented immigrants from accessing non-emergency health care and other services [45, 46], restrict access to health protective services, including those for HIV. Although further research is necessary to delve deeper into how mixed-status families affect engagement with PrEP among Latino SMM, one possible reason is that participants with at least one parent without legal residency may be less inclined to seek preventive care [41, 43]. This is particularly true given the evidence that mixed-status families tend to avoid preventive care for fear of deportation, even when some family members are U.S. citizens [49, 50]. Furthermore, undocumented immigrants or those from mixed-status families tend to present with more advanced stages of HIV diseases when initiating care compared to their peers with legal status [46], suggesting a similar hesitancy towards adopting PrEP. This area demands further research, especially considering the increasing number of Latino migrants in the U.S.

Interestingly, our findings also reveal that first-generation Latino SMM are more likely to advance to the later stages of the PrEP Contemplation Ladder compared to individuals of at least second-generation status. This outcome is surprising, given the well-documented obstacles first-generation Latinos encounter in accessing healthcare, including widespread ineligibility for Medicaid in numerous states, based on their documentation status [41–43, 47]. These findings can be interpreted through the lens of the Hispanic Health Paradox [51–53]. This paradox posits that despite facing socioeconomic, cultural, and linguistic hurdles, newly immigrated Latinos often experience better health outcomes than both their U.S.-born peers and non-Hispanic Whites. However, these health benefits tend to wane the longer they live in the U.S., especially among families with mixed residency statuses [41, 45].

The evidence regarding the Hispanic Health Paradox varies across different sub-ethnic Latino groups and health outcomes such as diabetes, cancer, and depression [48]. However, researchers believe two key factors contribute to the Hispanic Health Paradox. Firstly, immigrating to a new country is a demanding and challenging, resulting in only resilient and healthier individuals making the journey. Secondly, Latino culture's closely-knit structure and traditional familial values offer some form of protection and insulation for individuals. However, over time and due to the influence of U.S. culture, this cultural strength deteriorates, leading to worse health outcomes [47, 51–53]. Based on previous seminal research [41], first-generation Latinos in our study may be more likely to progress to the later stages of the PrEP cascade due to their resilience and commitment to their health and well-being. This ensures they can work and continue providing for their families. Although further investigation is required to fully understand this hypothesis, our data indicates that first-generation Latino SMM demonstrate a heightened level of motivation and progress in the PrEP cascade. This is further supported by qualitative insights from healthcare providers, who note an increased eagerness among this group to seek healthcare services to preserve their health. Moreover, when first-generation or undocumented Latino SMM live in the U.S. for prolonged periods, they face considerable structural obstacles in accessing social and healthcare services [39–43]. This, coupled with experiences of rejection, discrimination, and isolation [39], may lead to a decrease in their motivation for preventive care, as indicated by the Hispanic Health Paradox. There is an urgent need for more longitudinal studies to delve into this hypothesis.

Our quantitative analysis, consistent with prior studies [11, 13, 54–57], demonstrates a correlation between higher annual incomes and urban living among Latinos, which is linked to an increased probability of advancing through the stages of the PrEP cascade. However, our qualitative research reveals that when Latinos are provided with adequate referrals and resources—including transportation assistance, education about available services, housing support, and access to comprehensive care—they are equally likely to progress through the cascade's action, initiation, and maintenance stages, regardless of their income level or whether they reside in rural areas. This suggests that interventions to reduce structural barriers and improve access can effectively bridge the gap in PrEP delivery among Latinos. These interventions, commonly known as social determinants of health interventions [9, 58], focus on addressing factors related to necessities like money, food, and shelter in addition to or instead of directly addressing HIV-related risk behavior. Unfortunately, a comprehensive review found that out of the 213 interventions classified as structural interventions in HIV prevention, only eight were explicitly tailored for the Latino community [9].

Limitations

The present study has certain limitations that should be acknowledged. Firstly, the study design was cross-sectional, restricting our ability to establish temporal order. To address this, future studies employing prospective designs could shed light on the sequential nature of Latino SMM's navigation through the PrEP cascade. It is essential to recognize that these stages are not fixed, and individuals may transition between stages depending on various factors [11]. Additionally, our study did not directly investigate the specific obstacles Latino SMM encounter within the care cascade. Given previous research in this area, we instead concentrated on understanding healthcare providers' perspectives on barriers to advancing through the care cascade and identifying demographic and social factors, previously unexplored, that could pose unique challenges to progression. Further, the composition of our sample limits the generalizability of our findings to non-Latinos and Latino SMM who are not connected to care. It is worth noting that many Latinos do not have immediate access to healthcare settings similar to the one utilized in our study for recruiting participants and providers. Moreover, due to only receiving 3 responses from participants uncertain about their HIV risk, we grouped these responses with the "not at risk" category. This decision was made to avoid categorizing them inaccurately as either high or low risk. However, we acknowledge that this approach may not fully capture their risk level. Therefore, future studies should explore a more nuanced, non-binary method of assessing HIV risk. Additionally, it's notable that among those who identified as 'not at risk', 22 out of 53 responses came from participants in relationships. Our study did not differentiate between monogamous or open relationships, which suggests that some in monogamous relationships might not see themselves as candidates for PrEP, potentially impacting their progression through the PrEP cascade. Future research focusing on the PrEP cascade among Latinos should pay closer attention to relationship dynamics, identifying which individuals could benefit most from PrEP to enhance targeted prevention efforts. Finally, it is crucial to acknowledge that qualitative findings inherently involve subjectivity [59]. However, multiple researchers were actively engaged throughout the project to ensure the credibility and dependability of the study's findings, from coding to the triangulation of qualitative and quantitative data. We bolstered the credibility of our findings by conducting meticulous thematic content analysis and interpreting the data through extensive discussions and validation by the research team [34].

Conclusion

Our research highlights the critical need to tailor PrEP usage efforts to the unique demographics of Latinos in the U.S., particularly considering the diverse documentation statuses within this community and their impact on healthcare engagement. This entails not only improving service delivery and healthcare provider attitudes to facilitate navigation through the PrEP cascade but also integrating a comprehensive care approach. Such an approach recognizes the interconnectedness of services, such as those aiding undocumented immigrants or providing housing support, with HIV prevention and care services. Future research must focus on developing holistic care models that ensure individuals have access to a full spectrum of necessary services. The absence of one aspect of care can hinder engagement in others. Our findings illuminate key factors that influence the effective implementation of the PrEP cascade and propose actionable strategies for community clinics and federal agencies. These strategies aim to improve progression through the cascade for Latino SMM, a group whose diverse demographics have not been fully explored in this context.

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Declarations

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Conflict of Interest The authors have indicated they have no potential conflicts of interest to disclose.

Ethics Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Consent to Participate Informed consent was obtained from all individual participants included in the study.

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