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Article

Awareness, Intention to Use Pre-Exposure Prophylaxis, and Factors Associated with Awareness among Men Who Have Sex with Men in the Republic of Korea

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Abstract: This study assessed pre-exposure prophylaxis (PrEP) awareness, knowledge, and attitudes in a sample of 1389 men who have sex with men (MSM). Using a self-report survey, we measured PrEP knowledge mean scores, attitudes toward PrEP, and awareness rates to identify the key influences on PrEP uptake. PrEP awareness among participants was 66.3%, with 33.7% having never heard of PrEP. Approximately 4.5% had previous experience with PrEP but were not current users, while only 2.7% reported that they were currently taking it. Logistic regression analysis revealed that the significant predictors of PrEP awareness were educational attainment, marital status, prior HIV testing knowledge, and attitudes toward PrEP. Several demographic factors were not significant predictors of intention to use PrEP; however, using the internet to meet partners, number of partners, HIV testing, positive attitudes, and reduced perceived barriers played a critical role in shaping PrEP use intentions. These findings highlight the critical role of targeted educational strategies and tailored public health messaging in enhancing the awareness and intention to use PrEP among MSM.

Keywords: HIV; knowledge; stigma; MSM; PrEP

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1. Introduction

Over the past two decades, there has been a discernible downward trend in human immunodeficiency virus (HIV) transmission rates worldwide, indicating significant progress in the prevention and eventual elimination of HIV infection and highlighting global efforts to combat HIV infections. This situation remains an ongoing public health concern in Korea. Despite the general global decline in HIV transmission rates, the HIV prevalence among men who have sex with men (MSM) has alarmingly increased, particularly in certain Asian regions [1,2]. This population has seen a notable rise in HIV infections, raising societal concerns. An epidemiological report from 2022 indicated that 99.1% of new HIV infections are sexually transmitted, with infections attributed to MSM contact increasing from 56.9% in 2018 to 60.3% in 2022 [3]. These data underscore the vulnerability of the population of MSM in Korea, which is exacerbated by the intersection of sociocultural and epidemiological factors. However, the relationship between MSM and HIV in Korea remains somewhat enigmatic, with a relative dearth of research focusing on this group. This research gap is partly due to societal discomfort with homosexuality and HIV, hindering the advancement of studies on this critical nexus [1,4].

The Korean government implemented several policies aimed at reducing HIV infections in response to the increased rates of infection among high-risk groups. These policies include providing accurate information about HIV, reducing social discrimination against those living with HIV, and offering free anonymous HIV testing. These initiatives are designed to encourage preventive approaches and facilitate HIV testing, early diagnosis, and treatment and have shown promising results. Despite these efforts, the HIV infection rates have not significantly decreased, prompting the government to explore additional

strategies. One is to promote the use of pre-exposure prophylaxis (PrEP) in high-risk groups, including MSM.

PrEP is a proactive and effective method that allows HIV-negative individuals to take medication before exposure to HIV, thereby preventing infection. Studies in countries such as Germany, the United Kingdom, and the Netherlands have shown that PrEP is not only effective but also cost-effective [5–7]. Following the publication of the first studies on PrEP, the World Health Organization endorsed its use in 2014, recognizing its importance as a key biomedical tool in the fight against HIV [8,9]. Since then, PrEP approval has expanded globally, with more than 50 countries and territories sanctioning its use [9].

A study by Kim et al. (2014) mathematically modeled the extent to which the use of PrEP for HIV prevention would reduce HIV infection rates, further demonstrating that it is highly effective. Although the effectiveness of PrEP could be reduced by increased unsafe sexual behavior, PrEP use remains more beneficial [2]. Understanding how MSM in Korea perceive PrEP, their attitudes toward it, and their intentions to use it are critical public health issues. Internationally, PrEP has been hailed as an effective strategy for reducing HIV infection, particularly among populations most vulnerable to the disease [6]. Despite this, awareness and uptake of PrEP among MSM worldwide remain modest. This is due to several challenges, including difficulties in accessing information, the cost of the drug, and its availability [2,10–12]. Addressing these barriers is essential to increase the effectiveness of PrEP as a preventive measure against HIV.

In Korea, MSM are among the groups with high rates of HIV infection [1]; therefore, understanding their perceptions, attitudes, and intentions toward PrEP is essential for designing and implementing effective HIV prevention programs. However, research on the perceptions, attitudes, and intentions to use PrEP among MSM in the Korean cultural context is notably lacking, creating an obstacle for effectively designing and implementing PrEP programs. Additionally, the lack of research indicates the need for in-depth studies on this topic. Understanding the knowledge, perceptions, stigma, and intentions regarding PrEP could ultimately provide critical baseline data for HIV prevention. Such research could contribute to the design and implementation of more effective HIV prevention strategies, including PrEP. It could also play an important role in improving HIV perception in Korean society and promoting a comprehensive approach to HIV prevention and management.

2. Materials and Methods

2.1. Research Design

We used a combination of online and offline surveys because online sampling can be problematic for those who do not use gay websites or dating applications, such as MSM who do not use the internet to find partners. The allocated sample size for the online survey was 1100, while that for the offline survey was 300. The sampling method for the online survey was based on age as a stratification variable and was divided into three strata (i.e., 19–29 years old, 30–39, and $\geq$40 years). A total of 1100 people were selected as the target sample size. We obtained the proportion of men in each age group from Korea Statistics and allocated them according to population proportion (PPS). For the offline survey, we randomly selected gay bars in Seoul. Survey start dates were separated by approximately one week to avoid the possibility of duplicate responses from respondents in the gay bar and online surveys. To ensure that individuals did not participate in both online and offline surveys simultaneously, this study included a screening question at the beginning of each survey to check for recent participation, thereby aiming to prevent duplicate responses. For the online survey, respondents were given a mobile phone voucher worth 5000 won; for the gay bar survey, they were given a cultural voucher worth 10,000 won.

2.2. Participants and Procedures

The survey aimed to achieve representativeness and statistical reliability by initially setting the sample size to 384 participants. This number was selected based on an expected 50% prevalence rate of correct answers, a 95% confidence level, and a 5% margin of error.

The sample size was significantly increased to 1389 participants (1085 for online survey, 304 for offline survey) for the statistical power of the study, ensuring that the results were a robust and accurate reflection of the MSM population in Korea. Data collection was conducted in Seoul between July and August 2022. The survey targeted MSM, aged 19–49 years or older, with eligibility based on participants' self-reported engagement in oral or anal sex with at least one male partner in the previous year. The survey was approved by the Institutional Review Board (SYU 2022-07-007-002), which further ensured its credibility and ethical compliance. Informed consent was obtained from all participants in the study in accordance with the IRB guidelines. SPSS statistics software package version 26.0 (IBM Corp., Armonk, NY, USA) was used for the statistical analyses.

2.3. Measures

The research team developed a structured questionnaire that included general and PrEP-specific questions. The questionnaire was comprehensive and covered a range of topics, including demographic characteristics such as age, education, marital status, and place of residence. It also covered areas such as HIV testing history, history of sexually transmitted infections (STIs), HIV status, sexual behavior, condom use, and various aspects of PrEP. These questions assessed awareness, knowledge, attitudes toward PrEP, perceived stigma, subjective norms influencing PrEP use, and self-efficacy in obtaining and using PrEP.

2.3.1. PrEP-Related Knowledge

The PrEP-related knowledge scale was a modified version of the attitude scale developed and validated by Walsh (2019) [10]. The knowledge component of PrEP was assessed using three true statements: PrEP is a drug to prevent HIV infection, it should not be used by individuals who do not know their HIV status, and regular HIV testing is required every 3 months while taking PrEP. Answers were given as *correct*, *incorrect*, or *don't know*, with a total knowledge score of 1 for correct answers and 0 for incorrect answers.

2.3.2. PrEP-Related Attitude

The survey included a subset of items developed by Walsh (2019) [10], which was adapted to the context of South Korea. Mainly, it consisted of nine items divided into three subscales, each consisting of three questions. These subscales were designed to measure attitudes toward PrEP, the stigma associated with its use, and the perceived barriers to PrEP uptake. The positive attitude subscale assesses individuals' perceptions of PrEP users as being responsible and acknowledgment of the safety and effectiveness of PrEP in preventing HIV infection. The stigma subscale addresses potential embarrassment about being prescribed PrEP, stereotypes of PrEP users as sexually promiscuous, and discomfort with friends knowing about one's PrEP use. The barriers subscale focuses on challenges such as the affordability of PrEP, the daily commitment required for adherence, and the inconvenience of obtaining a prescription. Responses to each question were scored on a 5-point Likert scale, with a score of 5 indicating strong agreement and a score of 1 indicating strong disagreement. Responses for each subscale were summed to produce a total score that provided a comprehensive measure of the participants' attitudes toward PrEP, concerns about stigma, and perceived barriers to PrEP use. The positive attitudes toward PrEP, stigma, and perceived barriers subscales had Cronbach's alpha values of 0.81, 0.70, and 0.79, respectively, indicating acceptable internal consistency.

2.3.3. PrEP-Related Awareness and Intention

To assess the awareness of PrEP among MSM, participants were asked about their previous knowledge of PrEP. For those not currently using PrEP, the intention to consider using PrEP was assessed by presenting them with information through the statement, "PrEP is an HIV prevention drug called Truvada that is available by prescription in the United States. It must be taken daily to prevent HIV infection". Intention to use PrEP in the

future was also assessed. The respondents were provided with information related to cost: "The monthly cost of PrEP is $100 to $150, assuming you have health insurance coverage", and that it was also available to people who were not currently using PrEP. The response options were 1, indicating a reluctance to use PrEP; 2, indicating a willingness to use PrEP; and 3, indicating a willingness to use PrEP if the cost was covered. Responses indicating willingness or conditional willingness to use PrEP (marked 2 or 3) were aggregated to reflect the general willingness to use PrEP.

3. Results

3.1. Sociodemographic Characteristics

Table 1 shows the demographic and behavioral characteristics of the 1389 MSM participants. The demographic characteristics of the respondents indicated that the largest age group (54.8%) was within the age range of 25–39 years. Individuals aged 40 years and older accounted for 34.8%, whereas those under 25 years accounted for a smaller proportion (10.4%). Most participants (83.2%) were single. Cohabitation was less common, with only 4.9% of respondents stating that they were currently in a relationship. Those who were divorced or widowed represented 9.0% of the sample. In terms of educational attainment, a majority (76.6%) had a college education or higher, in contrast to 23.4% who had a high school education or less. In terms of monthly income, 48.6% of the participants earned between 2 and 4 million won. A sizable percentage (29.4%) earned less than 2 million won, whereas 22.0% earned a monthly income of 4 million won or more.

Table 1. Demographic and behavioral characteristics of MSM.

		N	**%**
Age (years)	<25	145	10.4
	25–39	761	54.8
	≥40	483	34.8
Marital Status	Single	1156	83.2
	Married/cohabitating	68	4.9
	Divorced/widowed	125	9.0
Education	≤High school	325	23.4
	≥College	1064	76.6
Monthly income (won)	<2 million	409	29.4
	2–4 million	675	48.6
	> 4 million	305	22.0
Sexual orientation	homosexual	1187	85.5
	bisexual/heterosexual	222	14.6
Use of the internet to meet partners	No	362	26.1
	Yes	1027	73.9
Number of MSM partners in the previous 6 months (N = 1280) [+]	≤1	491	38.4
	2–9	635	49.6
	≥10	154	12.0
Condom use during last instance of anal sex (N = 1280) [+]	No	518	40.5
	Yes	762	59.5
STI infection	No	1215	87.5
	Yes	174	12.5
HIV infection	No	1209	87.0
	Yes	99	7.1
	Do not know	81	5.8
HIV testing	No	465	28.4
	Yes	924	71.6

[+] Excludes people who have not had intercourse in the last 6 months.

In the sample, 85.5% of the participants self-identified as homosexual, and 14.6% as bisexual or heterosexual. The majority (73.9%) reported using the internet to meet partners. In terms of sexual activity, 38.4% had no more than one MSM partner in the past six months, 49.6% had between two and nine partners, and 12% had ten or more partners. Among those who were sexually active, excluding those who reported not having anal sex, 59.5% used condoms during anal intercourse, while 40.5% did not. Regarding STIs, 87.5% of participants reported that they did not have an STI, whereas 12.5% reported that they had it. Regarding HIV status, 87% of the respondents were not infected with HIV, 7.1% were HIV positive, and 5.8% were unsure of their status. Regarding HIV testing, most (71.6%) have been tested for HIV, while 28.4% have not been tested.

3.2. PrEP-Related Awareness

PrEP awareness among participants was 66.3%, with 33.7% having never heard of PrEP. Approximately 4.5% had previous experience with PrEP but were not current users, while only 2.7% reported that they were currently taking it. To ascertain the intention of PrEP use, after excluding 37 current users of PrEP, participants were informed about PrEP, also known in the US as Truvada, an HIV-prevention medication requiring daily administration. Regarding future intentions, 63.2% of those who were not current users indicated that they had no intention to use PrEP, whereas 36.8% expressed openness to the possibility. Subsequently, participants were asked about their willingness to use PrEP. Additionally, they were informed that the monthly cost of PrEP in Korea would range from 100 to 150 won, assuming they had existing health insurance coverage. This information was presented to those who were not current PrEP users. When considering future use, after excluding the 37 current users of PrEP, 63.2% indicated they had no intention to use PrEP, whereas 36.8% were open to considering its use. When the participants were presented with the scenario of PrEP being fully covered by insurance, 18.6% indicated that they did not intend to use PrEP, 23.7% indicated that they would be willing to do so, and a majority (55.7%) indicated that they would be willing to use PrEP if the cost was covered by insurance (Table 2).

Table 2. PrEP-related awareness and intention to take PrEP (n = 1389).

		n	**%**
Awareness of PrEP	Never heard	468	33.7
	Heard of it but no experience taking it	822	59.2
	Have taken PrEP before but not currently	62	4.5
	Currently taking PrEP	37	2.7
Intention to take PrEP (current user excluded: n = 37)	No	855	63.2
	Yes	497	36.8
Intention to take PrEP if covered (current users excluded: n = 37)	No	258	18.6
	Yes	320	23.7
	Yes, to use PrEP if the cost was covered	774	55.7

3.3. Factors Related to Awareness and Intention to Use of PrEP

Multivariate analysis was conducted to identify predictors of PrEP awareness (Table 3). A logistic regression model examining PrEP awareness demonstrated that independent variables accounted for approximately 18.6% of the variance in PrEP awareness (Nagelkerke's R^2 = 0.186).

Comparisons of age groups revealed no significant differences in PrEP awareness. Individuals aged 25 to 39 had an odds ratio (OR) of 1.12 (95% confidence interval [CI]: 0.70–1.79, p = 0.600), while those aged 40 and older had an OR of 0.72 (95% CI: 0.43–1.20, p = 0.203) when compared to the under 25 reference group. Those aged 25 to 39 had an OR of 0.72 (95% CI: 0.43–1.20, p = 0.203) when compared to the under-25 reference group. Educational attainment is a significant factor. Participants with college or higher

education were nearly twice as likely to be aware of PrEP (OR = 1.93, 95% CI: 1.40–2.66, $p < 0.001$) compared to those with high school education or less. Significant differences were observed in terms of marital status. Married participants were less likely to be aware of PrEP (OR = 0.30, 95% CI: 0.16–0.55, $p < 0.001$) compared to single individuals. No significant associations were identified between monthly income, sexual orientation, Internet use for meeting partners, number of MSM partners in the preceding 6 months, or PrEP awareness. Furthermore, no significant association was found between condom use with a steady partner and PrEP awareness (OR = 1.10, 95% CI: 0.85–1.44, $p = 0.469$). Similarly, no significant associations between STI, HIV infection status, and PrEP awareness were identified. However, a history of HIV testing was significantly related to awareness of PrEP. Those who had been tested for HIV were more likely to be aware of PrEP (OR = 1.66, 95% CI: 1.23–2.23, $p = 0.001$).

Table 3. The factors associated with awareness among MSM ($N = 1389$).

		Aware (*N* = 921)		**Unaware (*N* = 468)**			**95% CI**		
		n	**%**	***n***	**%**	**OR**	**Lower**	**Upper**	***p***
Age (years)	<25	81	8.8	64	13.7	ref	-	-	-
	25–39	547	59.4	214	45.7	1.12	0.70	1.79	0.631
	≥40	293	31.8	190	40.6	0.72	0.43	1.20	0.203
Education	≤high school	178	19.3	147	31.4	ref	-	-	-
	≥college	743	80.7	321	68.6	1.93	1.40	2.66	<0.001
Marital status	single	785	85.2	371	79.3	ref	-	-	-
	married	24	2.6	44	9.4	0.30	0.16	0.55	<0.001
	cohabitating	86	9.3	39	8.3	0.84	0.51	1.36	0.473
	divorced/widowed	26	2.8	14	3	0.88	0.40	1.96	0.753
Monthly income (won)	<2 million	261	28.3	148	31.6	ref	-	-	
	2–4 million	458	49.7	217	46.4	1.00	0.73	1.39	0.982
	>4 million	202	21.9	103	22	0.92	0.61	1.38	0.678
Sexual orientation	homosexual	806	87.5	381	81.4	ref	-	-	-
	bisexual/heterosexual	115	12.5	87	18.6	0.84	0.58	1.21	0.350
Use of Internet to meet partners	no	223	24.2	139	29.7	ref		-	-
	yes	698	75.8	329	70.3	0.99	0.71	1.37	0.929
Number of MSM partners in the preceding 6 months	≤1	299	34.6	192	46.3	ref	-	-	-
	2–9	450	52	185	44.6	1.29	0.96	1.74	0.173
	≥10	116	13.4	38	9.2	1.41	0.88	2.26	0.089
Condom use in MSM anal sex with steady partner	no	343	39.7	175	42.2	ref	-	-	-
	yes	522	60.3	240	57.8	1.10	0.85	1.44	0.469
STI infection	no	791	85.9	424	90.6	ref	-	-	-
	yes	130	14.1	44	9.4	1.04	0.69	1.58	0.837
HIV infection	no	792	86	417	89.1	ref	-	-	-
	yes	76	8.3	23	4.9	1.02	0.58	1.80	0.947
	do not know	53	5.8	28	6	1.14	0.65	2.01	0.650
HIV testing	no	186	20.2	184	39.3	ref.	-	-	-
	yes	735	79.8	284	60.7	1.66	1.23	2.23	0.001
Continuous variable		M	SD	M	SD	-	-	-	-
PrEP knowledge		1.28	0.93	0.85	1.00	1.63	1.41	1.89	<0.001
PrEP positive attitude		4.00	0.70	3.81	0.77	1.32	1.09	1.59	0.004
PrEP stigma		2.91	1.01	3.07	0.92	0.95	0.82	1.10	0.473
PrEP barrier		3.74	0.92	3.80	0.90	0.91	0.78	1.07	0.256

Furthermore, increased knowledge about PrEP was a robust predictor of awareness with a significant OR of 1.63 (95% CI: 1.41–1.89, $p < 0.001$). A positive attitude toward

PrEP also significantly predicted higher awareness (OR = 1.32, 95% CI: 1.09–1.59, $p = 0.004$). Perceived stigma and barriers were not significant predictors of PrEP awareness, with ORs of 0.95 (95% CI: 0.82–1.10, $p = 0.473$) and 0.91 (95% CI: 0.78–1.07, $p = 0.256$), respectively.

This analysis indicates that while certain demographic factors such as education and marital status are influential, knowledge and attitudes towards PrEP, along with HIV testing history, are more definitive factors for PrEP awareness.

Multivariate analysis was conducted to identify predictors of the intention to use PrEP (Table 4). A logistic regression model examining PrEP awareness demonstrated that the independent variables accounted for approximately 16.7% of the variance in the intention to use PrEP (Nagelkerke's $R^2 = 0.167$).

Table 4. The factors associated with the intention to use PrEP among MSM ($N = 1389$).

		Intention to Use PrEP ($n = 497$)		No Intention to Use PrEP ($n = 892$)		95% CI			
		n	%	*n*	%	OR	Lower	Upper	*p*
Age (years)	<25	93	10.4	52	10.5	ref			
	25–39	498	55.8	263	52.9	0.85	0.53	1.38	0.518
	≥40	301	33.7	182	36.6	0.68	0.41	1.15	0.152
Education	≤high school	202	22.6	123	24.7	ref			
	≥college	690	77.4	374	75.3	0.95	0.68	1.31	0.744
Marital status	single	751	84.2	405	81.5	ref			
	married	38	4.3	30	6.0	0.68	0.37	1.24	0.208
	cohabitating	79	8.9	46	9.3	0.91	0.56	1.47	0.702
	divorced/widowed	24	2.7	16	3.2	0.99	0.45	2.19	0.974
Monthly income (won)	<2 million	243	27.2	166	33.4	ref			
	2–4 million	447	50.1	228	45.9	1.28	0.94	1.75	0.124
	>4 million	202	22.6	103	20.7	1.37	0.92	2.04	0.119
Sexual orientation	homosexual	767	86.0	420	84.5	ref			
	bisexual/heterosexual	125	14.0	77	15.5	1.13	0.78	1.64	0.514
Use of Internet to meet partners	no	187	21.0	175	35.2	ref			
	yes	705	79.0	322	64.8	1.59	1.16	2.18	0.004
Number of MSM partners in the previous 6 months	≤1	279	33.3	212	48.1	ref			
	2–9	442	52.7	193	43.8	1.35	1.01	1.80	0.041
	≥10	118	14.1	36	8.2	1.63	1.01	2.62	0.045
Condom use in MSM anal sex with steady partner	no	343	40.9	175	39.7	ref			
	yes	496	59.1	266	60.3	0.99	0.76	1.28	0.929
STI infection	no	761	85.3	454	91.3	ref			
	yes	131	14.7	43	8.7	1.20	0.80	1.82	0.376
HIV infection	no	768	86.1	441	88.7	ref			
	yes	68	7.6	31	6.2	0.78	0.46	1.32	0.351
	do not know	56	6.3	25	5.0	1.65	0.90	3.04	0.107
HIV testing	no	187	21.0	183	36.8	ref.			
	yes	705	79.0	314	63.2	1.68	1.25	2.26	0.001
Continuous variables		M	SD	M	SD				
PrEP knowledge		1.24	0.93	0.96	1.00	1.15	1.00	1.32	0.057
PrEP positive attitude		4.08	0.70	3.67	0.77	2.13	1.75	2.58	<0.001
PrEP stigma		2.91	1.01	3.05	0.92	0.92	0.79	1.06	0.256
PrEP barrier		3.74	0.92	3.79	0.90	0.80	0.68	0.94	0.006

Note. Those using PrEP ($n = 37$) were also coded as intending to use PrEP and included in the logistic regression analysis.

Several factors were not significantly associated with the intention to use PrEP among MSM, including age, education level, marital status, sexual orientation, condom use during

anal sex with a steady partner, presence of STI, and HIV infection status. These results suggest that demographic and sexual health-related variables did not have a significant impact on whether participants intended to use PrEP.

However, certain factors significantly predicted the intention to use PrEP. Participants who used the internet to meet partners were 59% more likely to intend to use PrEP than those who did not (OR = 1.59, 95% CI: 1.16–2.18, $p = 0.004$). This finding may indicate that those who use the internet have broader exposure to information, leading to greater awareness and potential intention to use PrEP. The number of MSM partners in the past 6 months also predicted the intention to use PrEP. Participants with 2–9 partners had a 35% higher intention to use PrEP compared to those with one partner or less (OR = 1.35, 95% CI: 1.01–1.80, $p = 0.041$), while those with 10 or more partners had a 63% higher intention (OR = 1.63, 95% CI: 1.01–2.62, $p = 0.045$). These results suggest that those with more partners may perceive greater risk and, therefore, have a higher intention to use PrEP. HIV testing emerged as a significant predictor, with those who had been tested for HIV being 68% more likely to intend to use PrEP compared to those who had not been tested (OR = 1.68, 95% CI: 1.25–2.26, $p = 0.001$). This may indicate that people who use health services are more likely to understand the benefits of PrEP and are willing to use it.

A positive attitude towards PrEP was also associated with a higher likelihood of the intention to use PrEP. Participants with a positive attitude towards PrEP were more than twice as likely to intend to use PrEP compared to those with a negative attitude (OR = 2.13, 95% CI: 1.75–2.58, $p < 0.001$). This is consistent with the notion that positive beliefs drive health-related behaviors. Finally, perceived barriers to PrEP use also had a significant effect. Participants with higher perceived barriers were 20% less likely to intend to use PrEP (OR = 0.80, 95% CI: 0.68–0.94, $p = 0.006$), suggesting that reducing barriers, whether financial or related to access to care, could increase PrEP uptake.

Overall, these findings highlight that, while many demographic factors are not significant predictors of the intention to use PrEP, behavioral factors, healthcare engagement, positive attitudes, and reduced perceived barriers play a critical role in shaping PrEP use intentions.

4. Discussion

Our study of 1389 respondents provided a comprehensive examination of various aspects of PrEP knowledge, attitudes, awareness, and use. PrEP awareness among participants was 66.3%, with 33.7% having never heard of PrEP. Approximately 4.5% had previous experience with PrEP but were not current users, while only 2.7% reported that they were currently taking it. Our study findings are consistent with those of Fu et al. (2023) [13], who showed that nearly two-thirds (66.3%) of participating MSM had heard about PrEP, with only a small fraction (3.9%) using it. Similarly, our data revealed that 59.2% of the participants had heard of PrEP, with just 4.5% having used it in the past but not currently and an even smaller percentage (2.7%) currently using it. These comparable results suggest a consistent pattern of PrEP awareness and low usage across different nationalities and highlight the gap between awareness and actual use, emphasizing the need for further educational efforts and the reduction of barriers to increase PrEP adoption among MSM. Regarding barriers to PrEP use, 70.6% of respondents agreed that paying for PrEP was a financial burden. The daily regimen of PrEP was seen as a challenge by 62.8% of the participants, and 65.0% found the prospect of going to a hospital to obtain a PrEP prescription inconvenient and difficult, reinforcing previous research [9,14].

The participants were predominantly single (83.2%) and tended to be younger, with the largest age group (54.8%) falling within the 25–39 age range. A significant majority (76.6%) had a college education or higher, which was correlated with increased health literacy. Our observation that individuals with higher education levels were significantly more likely to be aware of PrEP aligns with existing research, which underscores that education is a determinant of health literacy. This association between education and PrEP awareness, where individuals with a college education were 93% more likely to be aware

of PrEP (OR = 1.93, 95% CI: 1.40–2.66), underscores the necessity for targeted educational campaigns that are attuned to varying literacy levels.

Conversely, married individuals had a lower likelihood of PrEP awareness. Consistent with recent studies [9,14,15], our research demonstrated that individuals who had previously undergone HIV testing exhibited a higher level of awareness regarding PrEP (OR = 1.66, 95% CI: 1.23–2.23). This could be attributed to increased exposure to healthcare environments, where such information is more likely to be disseminated.

Knowledge about PrEP emerged as a robust predictor of awareness (OR = 1.63, 95% CI: 1.41–1.89), suggesting that misinformation or lack of knowledge is a significant barrier to awareness and subsequent uptake. This is consistent with previous studies [9,14,16] demonstrating that knowledge is a precursor to the acceptance and adoption of health interventions. Moreover, positive attitudes towards PrEP correlated with a 32% increase in awareness (OR = 1.32, 95% CI: 1.09–1.59), reinforcing the role of positive health beliefs in facilitating the adoption of preventative healthcare behaviors and highlighting the areas where awareness and education can be improved to encourage greater PrEP uptake by MSM [16].

While previous research has identified stigma and perceived barriers as critical impediments to PrEP use, our study did not identify either as significant predictors of PrEP awareness. This is likely since people who are unaware of PrEP are less likely to develop attitudes about stigma or barriers to PrEP. Thus, a shift in societal attitudes may have occurred, where stigma does not play as dominant a role in awareness as previously thought. Alternatively, our chosen instrument for stigma may not have been sensitive enough to capture its nuances.

While many demographic factors did not significantly predict the intention to use PrEP, internet use, number of partners, HIV testing, positive attitudes, and reduced perceived barriers played a critical role in the intention to use PrEP. These results are consistent with previous studies [9,14,16] that demonstrated that knowledge is a strong factor in the intention to use PrEP. Further, those who use the Internet have broader exposure to information, leading to an increased potential intention to use PrEP. The number of MSM partners in the past 6 months also predicted the intention to use PrEP, indicating that those with more partners may perceive themselves to be at risk, increasing their intention to use PrEP. HIV testing has emerged as a significant predictive factor, indicating that those using health services are more likely to understand the benefits of PrEP and are willing to use it. Positive attitudes toward PrEP and perceived barriers to PrEP have been associated with a higher likelihood of the intention to use PrEP [11]; thus, reducing barriers, whether financial or related to access to care, could increase PrEP uptake.

PrEP offers advantages in HIV prevention, especially among high-risk populations such as MSM [12,17]. Its primary benefit is its effectiveness in reducing the risk of HIV infection when administered consistently, and several studies have shown that PrEP can reduce the risk of HIV infection by more than 90% in high-risk populations [17].

However, PrEP use is not without some concerns [18]. Common side effects include gastrointestinal issues such as nausea and diarrhea, as well as potential effects on kidney function and bone density. Although mild, these side effects require ongoing monitoring by healthcare providers to ensure user safety. Some studies report that PrEP use may increase the risk of STIs by leading to more condomless anal intercourse (CAI) and a greater number of sexual partners [18–20]. In fact, PrEP usage is associated with increased antibiotic resistance, raising concerns about the spread of bacterial STDs such as gonorrhea [21]. This phenomenon, known as risk compensation, arises from the perception that PrEP acts as a safety net, leading users to engage in riskier sexual behaviors. Reduced condom use not only increases the risk of STIs but also complicates public health efforts to promote comprehensive sexual health practices. Therefore, a balanced approach is required to address these concerns. Public health campaigns should emphasize that, while PrEP is effective against HIV, it does not protect against other STIs, reinforcing the importance of condom use. Regular STI screening should be encouraged to ensure the early detection and

treatment of any infection. Particularly within the MSM community, efforts are required through peer education to improve awareness and knowledge about PrEP [22]. By promoting responsible PrEP use and maintaining other preventive measures, the benefits of PrEP can be realized without compromising broader HIV prevention strategies.

The self-reported data used in this study inherently carry the potential for response distortion due to reliance on participant memory and social desirability bias, and securing a perfectly representative sample of MSM, a hidden population in South Korea, was challenging. To overcome these issues, the study employed both online and offline surveys to adopt diverse data collection methods and recruited a large sample size, which contributed to enhancing the statistical validity and generalizability of the research findings. Although perfect representativeness was not achieved, these efforts provided significant insights into the usage of PrEP among the MSM population in Korea and improved the reliability of the research results.

5. Conclusions

Our study confirms that higher education significantly increases PrEP awareness among MSM, emphasizing the importance of integrating health literacy into educational programs. HIV testing sites have emerged as effective platforms for disseminating PrEP information, particularly during HIV testing, highlighting the role of healthcare professionals in education. Although our results did not show stigma to be a significant barrier, other studies suggest that it still affects PrEP uptake, suggesting the importance of continued efforts to address stigma.

The interaction between demographic and behavioral characteristics suggests that addressing cultural, social, and economic factors is critical for effective public health strategies. These strategies should not only address knowledge dissemination and attitude shaping but also capitalize on established healthcare interactions, such as HIV testing, to bolster awareness and uptake. Future research should aim to uncover the influence of each factor on PrEP awareness and discern the most effective channels for public health intervention. Further research should focus on the specific influences on PrEP awareness and uptake among more targeted groups.

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