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연구논문

Factors Associated with an Human Immunodeficiency Virus (HIV) Testing Uptake and Differences by Sex in Lesotho

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Abstract

In this study, we examined factors associated with an uptake in Human Immunodeficiency Virus (HIV) testing and differences by sex in Lesotho. Separate models for women and men were analyzed using the 2014 Lesotho

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Demographic and Health Survey. First, the results of the model for men showed that those in the age range of 45–49 years had the highest odds for an uptake in HIV testing compared with that for other age ranges. The odds ratio was lower for men living in rural areas than for those in urban areas. Social rejection and the fear of casual contact were stigmas with lower odds ratios than the odds ratio for no stigma. Second, in the model for women, the odds ratio was the highest for women in the age range of 25–29 years for an uptake in HIV testing. Primary, secondary, and higher education had higher odds ratios than that for no education. Married women were positively significant for HIV testing compared to never-married women. However, HIV prevention knowledge and sexual behavior, including condom use and the number of lifetime sexual partners, all failed to prove statistical significance. Study findings showed a considerable difference between women and men in terms of the uptake in HIV testing. Thus, to develop effective policies or interventions for improving the rate of HIV testing, we need to carefully examine gender-specific perspectives from different angles. Using two distinct models with different variables for women and men may produce results that contribute to improved policies related to HIV testing.

Key words: Global Health, Human Immunodeficiency Virus (HIV) Testing, Lesotho

Ⅰ. INTRODUCTION

1. Background

1) Ongoing high level of HIV infections in sub-Saharan Africa

Human Immunodeficiency Virus / Acquired Immune Deficiency Syndrome (HIV/AIDS) is still a major health problem in the world, with more than 36 million people currently infected, 1.8 million new infections and nearly 1 million deaths worldwide in 2017 (UNAIDS, 2018). AIDS-related deaths worldwide have been declining since the peak of 2005 with an estimated 1.2 million. The number of new infections in HIV has declined since the late 1990s, but still remains high. The decline of new infections in sub-Saharan Africa has been offset by an increase of new infections in Eastern Europe and Central Asia, and AIDS-related deaths in these regions have increased about 2,400 percent over the past 15 years (World Health Organization, UNAIDS, United Nations Children's Fund (UNICEF), 2011). Lesotho experienced HIV for the first time in 1986. In 1993, 4% of the population were presumed to be infected, which was quick and devastating (Loewenberg, 2007). Soon after, Lesotho became one of the highest rates of the HIV prevalence in the world (adult prevalence: 25%), with higher prevalence among women than men (Ministry of Health & ICF International, 2016).

2) HIV as one of the chronic diseases

New HIV infections fell by approximately 40 per cent between 2000 and 2013, from an estimated 3.5 million cases to 2.1 million. By June 2014, 13.6 million people living with HIV were receiving antiretroviral therapy (ART) globally, an immense increase from just 800,000 in 2003. ART averted 7.6 million deaths from AIDS between 1995 and 2013 (UN, 2015). ART has been a spectacular success. People are now asking if the end of AIDS is possible (Deeks, 2013). However, new set of HIV-associated complications have emerged, resulting in a novel chronic disease that for many will span several decades of life. In particular, according to the World Health Organization, individuals with HIV during the period of the COVID-19 pandemic were more frequently exposed to various diseases, as they

were more susceptible to COV-19 complications. In order to maximize the benefits of therapy on an individual and community levels, at risk individuals need first to get tested, and those who are infected have to access care, start treatment, stay in care and remain adherent to HIV therapy (Deeks, 2013).

3) HIV as the key indicators to estimate the progress in the Sustainable Development Goal (SDGs)

The 2030 Agenda for Sustainable Development reflects the interdependence and complexity of a changing world and the imperative for global collective action. Factors related to HIV/AIDS are one of key indicators to estimate the progress in the SDGs, addressing the determinants of health and vulnerability of people at risk of and living with HIV. Identifying people who need treatment is essential to end the AIDS epidemic and maintain the quality life with HIV. Although HIV testing services have been scaled up considerably worldwide, gaps are still remaining. Between 2010 and 2014, more than 600 million people received HIV testing services in 122 low- and middle-income countries (World Health Organization, 2015). In 2017, it was estimated that, globally, 75% of people with HIV were aware of their HIV positive status, an increase from 67% in 2015. Despite this progress, 9.4 million people – 25% of all people with HIV – remain unaware of their HIV infection (UNAIDS, 2018). These key populations in the gap are experiencing disproportionate risk and vulnerability, and require more frequent testing and more focused, strategic targeting of testing services.

In this effort, addressing gender when monitoring and evaluating HIV projects ensure equity in access for men and women. Gender expectations shape behaviors and beliefs related to HIV risk and vulnerability, also affect health- seeking behavior for HIV testing. Sex disaggregation is one of the most fundamental way to understand the effect of gender. By identifying gender gaps in testing, sex disaggregation can be imperative in achieving targets related HIV/AIDS in the SDGs.

Ⅱ. LITERATURE REVIEWS

In order to identifying research gaps and establishing our conceptual frameworks, we reviewed existing studies. Despite the high prevalence of HIV/AIDS in

Lesotho, there were not many studies related to HIV testing uptake. This is likely due to the challenging environment, making it difficult to obtain large-scale survey data. For this reason, the latest available nation-wide dataset of the 2014 Lesotho Demographic and Health Surveys (LDHS) was used for our research. There was a lack of HIV/AIDS research in Lesotho, based on an imperative gender-separative approach.

Prior studies were also reviewed about factors influencing HIV/AIDS testing uptake in the African countries. There were three HIV-related factors founded, such as HIV knowledge, sexual behavior, and stigma. HIV knowledge was also included as a factor associated with HIV test uptake, following by several studies (Achia & Obayo, 2013; Koku, 2011; Sambisa et al., 2010; Sonny & Musekiwa, 2022). In a similar way, variables reflecting condom use (Jean et al., 2012; Koku, 2011) and number of sexual partners (Leta et al., 2012; Menon et al., 2017; Staveteig et al., 2017) had been analyzed as the significant variables related to HIV-testing by many studies. Although only one study included experience for paid sex (Gage & Ali, 2005), it was selected as one of the independent variables representing sexual behavior for men; considering the situation in Lesotho where the domestic sex industry became an issue in health and social security policy. Multiple studies included HIV-related stigma as a factor (Kaufman et al., 2016; Leta et al., 2012) (〈Table 1〉).

〈Table 1〉 Studies related to factors on HIV testing in African countries

	Author	Titles	Data	Factors used for analysis
1	Gage & Ali	Factors associated with self-reported HIV testing among men in Uganda	Uganda, 2000-2001	Knowledge, behaviors/attitude, socio-demographic characteristics, know someone who has or has died of AIDS, knowledge of HIV test site
2	Achia	Trends and correlates of HIV testing amongst women: lessons learnt from Kenya	Kenya, 1998, 2003, 2008	Partner's level of education, HIV knowledge-perception, media-exposure, decision-making, STI in the last 12 months, know someone who has died of HIV, sex for gifts, perceived risk of HIV, age of first sex
3	Koku	Desire for, and uptake of HIV tests by Ghanaian women: the relevance of community level stigma	Ghana, 2003	Sexual risk, HIV prevention and transmission knowledge, personal stigma, community stigma (proportion of community members)

〈Table 1〉 Continued

	Author	Titles	Data	Factors used for analysis
4	Jean	Barriers to HIV testing in Côte d'Ivoire – the role of individual characteristics and testing modalities	Côte d'Ivoire, 2005	Sexual behavior, level of HIV-related knowledge (knowledge toward HIV and people living with HIV/AIDS, attitudes toward HIV and people living with HIV/AIDS
5	Kaufman	The differential effects of an opt-out HIV testing policy for pregnant women in Ethiopia when accounting for stigma: secondary analysis of DHS data	Ethiopia, 2005, 2011	Birth in the past year, knowledge about HIV, stigma
6	Kirakoya-Samadoulougou	Uptake of HIV testing in Burkina Faso: an assessment of individual and community-level determinants	Burkina Faso, 2010	Media-exposure, sexual behavior, HIV knowledge, HIV stigma
7	Leta	"Factors affecting voluntary HIV counselling and testing among men in Ethiopia: a cross-sectional survey"	Ethipoia, 2005	Knowledge of HIV prevention, risky sexual behavior indicators as sexual behavior history, stigma
8	Menon	Determinants of HIV testing among sexually active young people in Zambia	Zambia, 2013	Media-exposure, perceived risk of getting HIV, sexual behavior, stigma
9	Sambisa	AIDS stigma as an obstacle to uptake of HIV testing: evidence from a Zimbabwean national population-based survey	Zimbabwe, 2005	Frequency of exposure to mass media, HIV knowledge, HIV risk awareness, sexual behavior
10	Staveteig	"Reaching the 'first 90': Gaps in coverage of HIV Testing among people living with HIV in 16 African countries"	Burkina Faso, and 15 other countries, 2010-2016	Lifetime number of sexual partners
11	Sonny ON	Trends and factors associated with HIV testing among adolescent girls and young women	Lesotho 2004, 2014	Socio-demographic factors, HIV knowledge, Sexual behavior

Note: HIV, Human Immunodeficiency Virus; AIDS, Acquired Immune Deficiency Syndrome; STI; Sexually Transmitted Infections.

Ⅲ. MATERIALS AND METHOD

1. Data

Data for this study came from the 2014 LDHS; implemented by the Lesotho

Ministry of Health from 22 September to 7 December 2014. A two-stage sample design was involved with selecting sample points (clusters) consisting of enumeration areas as well as systematic randomized sampling of households from a list. As a result, the 2014 LDHS included a nationally representative sample of women (aged 15–49 years) and men (aged 15–59 years) across ten districts. As previously mentioned, the most recent Lesotho data from DHS data set was from 2014, which is somewhat outdated. However, it was used in our analysis since it has the value as a dataset for a cross-sectional study.

The report on Lesotho Demographic and Health Survey 2014 published by Ministry of Health & ICF International (2016), which stated that "the nation-wide survey data provides updated estimates of basic demographic and health indicators. It includes fertility rates and preferences, maternal and child mortality rates, maternal and child health indicators, knowledge and attitudes of women and men about HIV/AIDS and other sexually transmitted diseases, patterns of recent behavior regarding the use of condoms and other contraceptive methods, and the incidence and prevalence of HIV infection". The study sample retained for analysis consisted of both women and men aged 15–49 years; who had answered to the question "have you ever been tested for HIV". The numbers of those who answered to the question are in total 6,621 for women (n=5,631, 85.0% for "yes", n=990, 15.0% for "no") and 2,931 for men (n=1,925, 65.7% for "yes", n=1,006, 34.3% for "no") respectively.

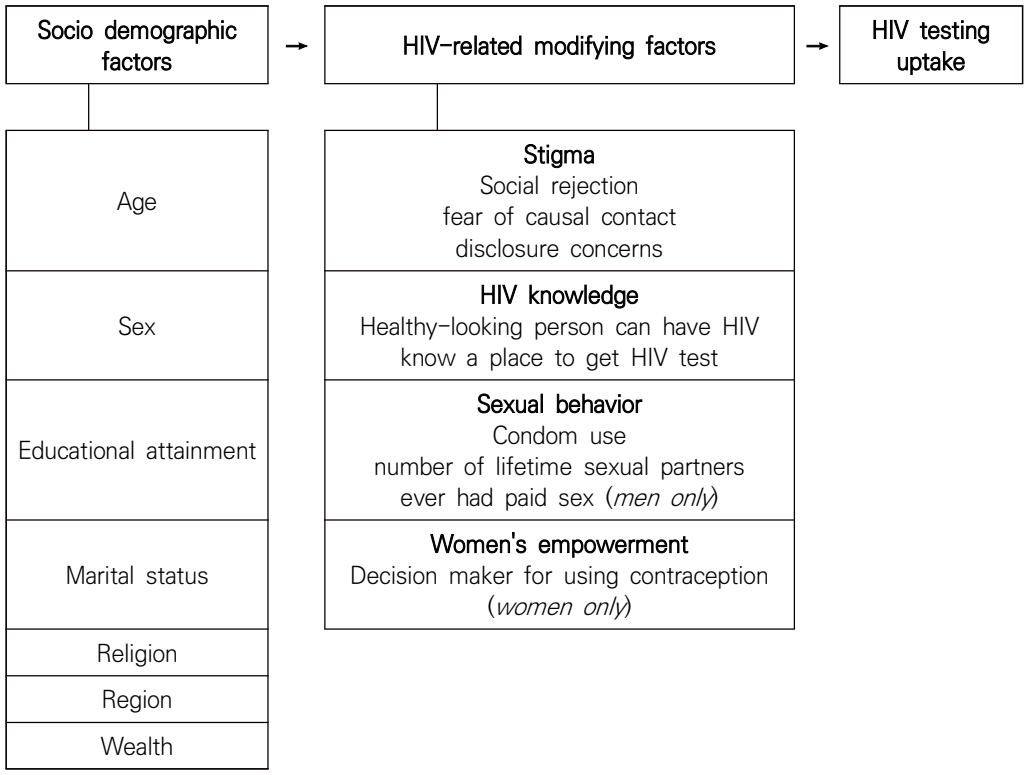
2. Conceptual Framework and Variables

From existing studies, we found common factors converged into, both positive and negative as well as individual and social, perception toward HIV/AIDS. According to the 'Health Belief Model' which was the old-fashioned but still-valid model in public health field, critical factors to make individuals take an action to avoid a disease were his or her perceived threat as well as perceived benefits and barriers (Rosenstock, 1974). Even though the original model itself was designed to explain the relationship of health behaviors, practices and utilization of health services by expressing in a solid relation. This study, however, adopted the main stream of the health belief model into the conceptual one-directional framework

from modifying factors toward the likelihood of taking an action through individual perception (〈Figure 1〉). Modifying factors generally include perceived threat, health motivation and cues to action. They were also composed of factors more likely to be affected by health policy or intervention; including stigma, HIV-related knowledge, and sexual behavior.

The main dependent variable was HIV testing uptake measured by answers from the question: 'Have you ever tested for HIV?'. The first predisposing independent variables included socio-demographic characteristics: age, sex, educational attainment, marital status, religion, region, and wealth. The second HIV-related modifying factors were composed respectively between women and men. For female population, the factors included Stigma, HIV prevention knowledge, Sexual behavior, and Women's empowerment. For male population, the factors included Stigma, HIV prevention knowledge, Sexual behavior, and whether had he ever

〈Figure 1〉 Conceptual framework for factors associated with HIV testing uptake



Note: HIV, Human Immunodeficiency Virus.

paid sex.

Each index of the socio-demographic factors was developed on the basis of their educational level, marital status, and wealth index from the original survey design and weights. Age distribution was set to 5-year intervals. And religion is not categorized but grouped as answered in the survey. Employment status was eliminated as it was only classified into 'all years', 'seasonal', or 'occasional'; hardly practical without their income information.

The operational definitions of the HIV-related modifying factors were built by taking in an organizational process. A template to classify and infer the characteristics and relation among numerous variables was used to initially sort out relevant variables in reference to previous studies. Among those, variables answered but had not been answered or omitted in the dataset were eliminated. Common variables included in both frameworks of women and men were stigma, HIV prevention knowledge, and sexual behavior. Stigma were classified in 3 different categories; social rejection (answering 'yes' to the question 'female teachers infected with HIV, but is not sick, should be allowed to continue teaching' as no stigma), fear of causal contract (answering 'yes' to the question 'willing to care for relative with AIDS' as no stigma), and disclosure concerns (answering 'no' to the question 'would want HIV infection in family to remain secret' as no stigma). HIV prevention knowledge were consisted of two questions about whether the participant (a) believed a healthy-looking person can have HIV as well as (b) know a place to get HIV test. Sexual Behavior were consisted of two questions about whether the participant (a) use condom (answering 'yes' to a sub-question 'always use condoms during sex' in the question category of 'Reduce risk of getting HIV') as well as (b) Number of lifetime sexual partners (answering score 1–4 to the question 'total lifetime number of sex partners'). For women, women empowerment was measured by the question 'decision maker for using contraception' (mainly respondent/mainly husband or partner/joint decision). For men, an experience whether the participant had ever paid sex were measured as an additional risky sexual behavior, especially in one of countries with the highest prevalence of HIV as well as the biggest sex industry. Many variables had responding options including 'Yes', 'no' and 'don't know/not sure/depends'. Since binary variables were developed for each item, 'don't know/not sure/depends' were omitted for in the an-

alytic tables.

3. Data Analysis

Descriptive analysis comprised frequencies and percentages presented in the form of tables. Adopted inferential statistics undergone as following:

First, simple logistic regression was performed to estimate the unadjusted odds ratios (ORs) using reference group and 95% confidence intervals (95%CIs) for examining the associations between each independent variable and the dependent variable. Second, multiple logistic regression was performed to estimate adjusted odds ratios (AORs) using reference group and 95% confidence intervals (95%CIs) for examining the factors associated with the HIV testing uptake. All variables were included for the multiple analysis except the variable of 'women's empowerment' which is inappropriate with the lack of fit of our theoretical model. Both descriptive and inferential analyses were weighted using the probability-weighted variable (v005), one of the variables in GDHS data set, since GDHS survey was obtained by two-stage sampling. Model fits were verified by Hosmer–Lemeshow goodness-of-fit test (〈0.05) and Area under ROC curve (〉0.5). The data were analyzed using STATA version 15.

4. Ethical Issues

All the participants of the 2014 LDHS were provided informed consent by well-trained fieldworkers and any identifiable information was eliminated in the dataset used in this study. The usage of the secondary dataset of 2014 LDHS was explained and approved through the official DHS website.

Ⅳ. RESULT

〈Table 2〉 presents the number of HIV testing uptake among women (age 15-49) and men (age 15-49). The 85.05% of women (N=5,631) and 65.68% of men (N=1,925) have ever been tested for HIV.

〈Table 2〉 HIV testing uptake among women (age 15-49) and men (age 15-49), 2014 LDHS

	Women		Men	
HIV testing uptake	N	Percentage (%)	N	Percentage (%)
Ever been tested for HIV	5,631	85.05	1,925	65.68

Note: HIV, Human Immunodeficiency Virus; LDHS, Lesotho Demographic and Health Surveys.

〈Table 3〉 presents the descriptive statistics of the study sample. About 79.52% of men (N=2,286) has no stigma and 90.76% of women (N=5,935) has no stigma in Social rejection. 90.96% of men (N=2,614) and 95.35% of women have no stigma

〈Table 3〉 Descriptive statistics, 2014 LDHS

Independent variables	Men		Women	
	Weighted total number (n)	Weighted (%)	Weighted total number (n)	Weighted (%)
Stigma				
Social rejection - Female teachers infected with HIV, but is not sick, should be allowed to continue teaching (reference yes)				
Yes	2,286	79.52	5,935	90.76
No	532	18.50	526	8.04
Don't know	57	1.98	78	1.19
Fear of causal contact - Willing to care for relative with AIDS (reference yes)				
Yes	2,614	90.96	6,235	95.35
No	220	7.67	265	4.05
Don't know	39	1.37	39	0.60
Disclosure concerns - Would want HIV infection in family to remain secret (reference no stigma)				
Yes	1,247	43.38	2,691	41.15
No	1,513	52.64	3,602	55.08
Don't know	114	3.98	246	3.76

〈Table 3〉 Continued

Independent variables	Men		Women	
	Weighted total number (n)	Weighted (%)	Weighted total number (n)	Weighted (%)
Sociodemographic characteristics				
Age				
15-19	690	26.28	1,542	23.29
20-24	534	20.34	1,300	19.63
25-29	394	15.00	1,072	16.19
30-34	345	13.14	907	13.70
35-39	275	10.47	728	11.00
40-44	222	8.45	582	8.79
45-49	166	6.32	490	7.40
Educational attainment				
No education	285	9.73	81	1.22
Primary or less	1,324	45.17	2,665	40.25
Secondary or higher	1,322	45.10	3,875	58.53
Marital status				
Never married	73	2.67	2,201	33.24
Ever married	2,646	97.33	4,420	66.76
Region				
Urban	991	33.80	2,202	33.26
Rural	1,940	66.20	4,419	66.74
Religion				
Roman catholic	1,194	41.18	2,558	39.04
Pentecostal	533	18.37	1,133	17.29
Lesotho evangelical	28	0.97	86	1.32
Other Christian	234	8.08	477	7.28
Anglican	24	0.81	43	0.65
Other	886	30.57	2,255	34.42
Wealth index				
Poorest	418	14.25	1,183	17.87
Poorer	535	18.24	1,138	17.19
Middle	599	20.43	1,307	19.74
Richer	659	22.50	1,453	21.95
Richest	721	24.58	1,540	23.26

〈Table 3〉 Continued

Independent variables	Men		Women	
	Weighted total number (n)	Weighted (%)	Weighted total number (n)	Weighted (%)
HIV prevention knowledge				
Healthy-looking person can have HIV				
Yes	2,496	86.85	6,000	91.58
No	314	10.92	454	6.93
Know a place to get HIV test				
Yes	2,702	94.01	6,429	98.12
No	172	5.99	122	1.88
Sexual behavior				
Condom use				
Yes	1,314	58.29	2,395	48.16
No	940	41.71	2,578	51.84
Number of lifetime sexual partners				
1	248	8.47	2,049	30.95
2	332	11.33	1,550	23.41
3	357	12.19	1,065	16.08
More than 4	1,993	68.01	1,957	29.56
Ever had paid sex (men only)				
Yes	330	12.79	n/a	
No	2,253	87.21		
Empowerment				
Decision maker for using contraception (women only)				
Mainly respondent	n/a		381	17.59
Mainly husband, partner			137	6.3
Joint decision			1,636	75.45
Other			14.07	0.65

Note: LDHS, Lesotho Demographic and Health Surveys; HIV, Human Immunodeficiency Virus; AIDS, Acquired Immune Deficiency Syndrome; n/a, Not Applicable.

in Fear of causal contact. Most of both sexes have no “Fear of causal contact” stigma. A relatively lower proportion, 52.64% of men (N=1,513) and 55.08% of women (N=3,602) have no stigma in Disclosure concerns. Moreover, as shown in 〈Table 3〉, about 75% of men 73% of women were aged 15–34 years, and about 90% of men and 98% of women receive more than primary education and a majority lived in rural areas. Among men, 97% had ever been married compared to 67% of women. A majority of both sexes thought that a healthy-looking person can have the HIV virus, and knew the place to take get HIV test. Men were more likely to use the condom during last sex (58%) than women (48%). Most respondents of men have had more than 4 of lifetime sexual partners, about 13% of men had ever paid sex. Among Women, 75% of respondents make the decision with their partner jointly for using contraception.

〈Table 4〉 presents the results of simple and multiple logistic regression and their 95% CIs for the association between factors and HIV/AIDS test uptake for men. And there are two variables omitted because of collinearity; 'know a place to get HIV test' and 'Marital status'. Significant influencing factors in the logistic regression model for men are age 45–49 (AOR 4.75; 95% 2.58–8.75) which had the highest odds of HIV/AID test uptake compared with age 15–19. Age 25–29 (AOR 2.60; 95% CI 1.76–3.82), age 35–34 (AOR 2.69; 95% CI 1.76–4.12), age 35–39 (AOR 3.54; 95% CI 2.16–5.72), age 40–44 (AOR 3.30; 95% CI 1.98–5.51) were all significant as well. Furthermore, rural men had lower OR compared to those in urban areas (OR 0.53; CI 0.39–0.73). People of middle wealth also had a lower OR compare to the poorest (OR 0.64; CI 0.42–0.98). Besides, social rejection (OR 0.57; CI 0.54–1.04) as well as fear of casual contact (OR 0.58; CI 0.37–0.93) in stigma had a lower OR compare to not having the stigma. On the other hands, the result showed that the association between Educational attainment, religion, wealth index; poorer, richer, richest in sociodemographic characteristics, stigma of disclosure concerns, HIV prevention knowledge, and sexual behaviors were not statistically significant for men. It is noticeable that all sexual behaviors including condom use, number of lifetime sexual partners, and ever had paid sex are statistically insignificant.

〈Table 5〉 presents the results of multiple logistic regression for the association between factors and HIV/AIDs test uptake for women. Unlike men, there is only

〈Table 4〉 Odds ratio (OR), adjusted odds ratios (AOR), p-values for association between factors and HIV/AIDS test uptake (Men)

Independent variables	Men					
	Simple analysis			Multiple analysis		
	Odds ratio (OR)	95% confidence interval	p-value	Adjusted odds ratio (AOR)	95% confidence interval	p-value
Stigma						
Social rejection - Female teachers infected with HIV, but is not sick, should be allowed to continue teaching (reference yes)						
No	0.39	0.32-0.47	0.00	0.57	0.54-1.04	0.00
Fear of causal contact - Willing to care for relative with AIDS (reference yes)						
No	0.37	0.29-0.50	0.00	0.58	0.37-0.93	0.02
Disclosure concerns - Would want HIV infection in family to remain secret (reference no stigma)						
Yes	0.83	0.71-0.98	0.02	0.88	0.69-1.11	0.29
Sociodemographic characteristics						
Age (reference 15-19)						
20-24	1.57	1.25-1.96	0.00	1.20	0.85-1.69	0.27
25-29	3.02	2.32-3.94	0.00	2.60	1.76-3.82	0.00
30-34	3.24	2.43-4.33	0.00	2.69	1.76-4.12	0.00
35-39	4.15	2.99-5.76	0.00	3.54	2.16-5.72	0.00
40-44	3.86	2.72-5.50	0.00	3.30	1.98-5.51	0.00
45-49	3.52	2.40-5.19	0.00	4.75	2.58-8.75	0.00
Educational attainment (reference no education)						
Primary or less	0.90	0.69-1.18	0.44	0.58	0.23-1.45	0.25
Secondary or higher	1.64	1.26-2.15	0.00	0.97	0.38-2.45	0.95
Place of residence (reference urban)						
Rural	0.46	0.38-0.54	0.00	0.53	0.39-0.73	0.00

〈Table 4〉 Continued

Independent variables	Men					
	Simple analysis			Multiple analysis		
	Odds ratio (OR)	95% confidence interval	p-value	Adjusted odds ratio (AOR)	95% confidence interval	p-value
Religion (reference others)						
Roman catholic	1.11	0.93-1.33	0.25	1.06	0.60-1.43	0.64
Pentecostal	1.42	1.13-1.79	0.00	1.19	0.84-1.67	0.31
Lesotho evangelical	0.77	0.36-1.64	0.49	0.86	0.27-2.97	0.81
Other Christian	1.44	1.05-1.97	0.02	1.19	0.76-1.87	0.43
Anglican	empty				-	-
Employment status (reference seasonal or occasional)						
All yeas	1.03	0.86-1.25	0.70	-	-	-
Wealth index (reference poorest)						
Poorer	1.39	1.08-1.81	0.01	0.93	0.60-1.43	0.75
Middle	1.24	0.96-1.59	0.09	0.64	0.42-0.98	0.03
Richer	2.01	1.56-2.60	0.00	1.05	0.65-1.58	0.94
Richest	2.67	2.06-3.46	0.00	0.69	0.42-1.11	0.13
Media exposure (radio) (reference not at all)						
Less than once a week	1.41	1.12-1.77	0.00	0.98	0.72-1.34	0.91
At least once a week	2.22	1.86-2.65	0.00	1.20	0.92-1.56	0.15
HIV prevention knowledge						
Healthy-looking person can have HIV (reference no)						
Yes	2.49	1.96-3.15	0.00	1.80	0.96-2.19	0.07
Condom use (reference no)						
Yes	1.00	0.84-1.20	0.97	0.17	0.79-1.31	0.86
Number of lifetime sexual partners (reference 1)						
2	1.08	0.78-1.53	0.62	1.14	0.69-1.87	0.59

Note: HIV, Human Immunodeficiency Virus; AIDS, Acquired Immune Deficiency Syndrome.

one variable omitted because of collinearity; 'know a place to get HIV test'. Significant factors in the model for women are age 25-29 (AOR 5.70; 95% CI 3.35-9.68) which had the highest odds of HIV/AID test uptake compared with age 15-19.

〈Table 5〉 Odds ratio (OR), adjusted odds ratios (AOR), p-values for association between factors and HIV/AIDS test uptake (women)

Independent variables	Women					
	Simple analysis			Multiple analysis		
	Odds ratio (OR)	95% confidence interval	p-value	Adjusted odds ratio (AOR)	95% confidence interval	p-value
Stigma						
Social rejection - Female teachers infected with HIV, but is not sick, should be allowed to continue teaching (reference yes)						
No	0.38	0.31-0.48	0.00	0.48	0.30-0.77	0.00
Fear of causal contact - Willing to care for relative with AIDS (reference yes)						
No	0.46	0.34-0.62	0.00	0.82	0.45-1.47	0.51
Disclosure concerns - Would want HIV infection in family to remain secret (reference no stigma)						
Yes	0.91	0.78-1.05	0.20	0.82	0.45-1.47	0.32
Sociodemographic characteristics						
Age (reference 15-19)						
20-24	5.47	4.49-6.66	0.00	2.57	1.79-3.68	0.00
25-29	20.11	14.31-28.24	0.00	5.70	3.35-9.68	0.00
30-34	16.06	11.56-22.31	0.00	2.91	1.73-4.88	0.00
35-39	12.89	9.21-18.04	0.00	2.54	1.47-4.37	0.00
40-44	8.94	6.42-12.44	0.00	1.05	0.62-1.77	0.83
45-49	8.19	5.84-11.46	0.00	1.26	0.71-2.23	0.42
Educational attainment (reference no education)						
Primary or less	1.88	1.03-3.44	0.03	7.17	3.22-15.98	0.00
Secondary or higher	1.35	0.74-2.44	0.32	6.44	2.82-14.07	0.00
Marital status (reference never married)						
Ever married	11.21	9.49-13.24	0.00	7.62	5.40-10.72	0.00

〈Table 5〉 Continued

Independent variables	Women					
	Simple analysis			Multiple analysis		
	Odds ratio (OR)	95% confidence interval	p-value	Adjusted odds ratio (AOR)	95% confidence interval	p-value
Place of residence (reference urban)						
Rural	1.09	0.95-1.26	0.19	1.24	0.91-1.68	0.16
Religion (reference others)						
Roman catholic	1.11	0.95-1.30	0.17	1.37	1.03-1.83	0.03
Pentecostal	1.27	1.03-1.57	0.02	1.65	1.13-2.40	0.00
Lesotho evangelical	0.72	0.42-1.23	0.24	0.71	0.26-1.94	0.51
Other Christian	1.45	1.07-1.97	0.01	1.94	1.09-3.46	0.02
Anglican	1.96	0.67-5.74	0.21	1.28	0.25-6.34	0.76
Employment status (reference seasonal or occasional)						
All yeas	1.56	1.21-2.01	0.00	-	-	-
Wealth index (reference poorest)						
Poorer	1.17	0.90-1.50	0.22	1.15	0.65-2.04	0.62
Middle	1.16	0.91-1.48	0.22	1.17	0.67-2.04	0.56
Richer	0.97	0.77-1.21	0.81	0.57	0.34-0.96	0.03
Richest	0.92	0.73-1.14	0.46	0.39	0.23-0.67	0.00
Media exposure (radio) (reference not at all)						
Less than once a week	1.27	1.02-1.58	0.02			
At least once a week	1.32	1.13-1.55	0.00			
HIV prevention knowledge						
Healthy-looking person can have HIV (reference no)						
Yes	2.01	1.60-2.54	0.00	1.51	0.93-2.45	0.09
Sexual ehavior						
Condom use (reference no)						
Yes	0.73	0.59-0.90	0.00	1.18	0.89-1.58	0.24

Note: HIV, Human Immunodeficiency Virus; AIDS, Acquired Immune Deficiency Syndrome.

Primary or less education (AOR 7.17; 95% CI 3.22–15.98) and secondary and higher education (AOR 6.44; 95% CI 2.82–14.07) also had high OR compared to no education. Married women (OR 7.62; 95% CI 5.40–10.72) were positively significant for HIV test compared to never married women. Additionally, Pentecostal (AOR 1.65; 95% CI 1.13–2.40) and Christian (AOR 1.94; CI 1.09–2.46) women had significant odds of HIV/AIDS test compared with others. Richer (AOR 0.57; 95% CI 0.34–0.96) and richest (AOR 0.39; 95% CI 0.23–0.67) women had a lower OR compared to the poorest. Unlike other socio-demographic factors mostly proven significant, HIV prevention knowledge and sexual behavior including condom use as well as number of lifetime sexual partners all failed to prove statistical significance. Two stigma variables, fear of causal contact and disclosure concerns, were also not statistically significant in multiple analysis. Furthermore, the controversial variable of women's empowerment did not only fail to be proved but also affect in the way to drop the total fit of the model.

V. DISCUSSION

In this study, we described the gender differences of the association between factors and HIV test uptake in Lesotho. Our findings showed different patterns and magnitudes of affecting factors toward an uptake in HIV testing depending on individual sex. AOR from our analysis suggested that a considerable difference between women and men. The pattern of socio-demographic variables including age, education attainment, and place of residence, demonstrated striking differences between women and men. The OR of an uptake in HIV testing for men was highest in the 45–49 age compared to the reference (15–19), and all other age ranges were statistically significant as well. It might be explained by the characteristic of the dependent variable, which is about whether he or she have ever had HIV testing. As the age of those surveyed increases, the available time for receiving HIV testing also extends, indicating that the likelihood of having the test tends to increase with age. On the other hand, the peak OR for women was in the 25–29 age compared to the reference (15–19). Unlike men, there was not statistically significant in the age groups of 40–44 and 45–49. This result is consistent with previous findings which shows that women are more likely to perceive and undergo

HIV testing in antenatal care (Madiba & Putsoane, 2020). In Lesotho, women in the age range of 25-29 frequently experience childbirth (Ministry of Health & ICF International, 2016). In the model for women, marital status also showed a statistically significant factor with an uptake in HIV testing, and this result can be explained for the same reasons.

Also, whereas women showed the clearly improved compliance with higher education, statistical failure to demonstrate the effect of education among men implied the complexity to reveal the characteristics of men as a social population. Studies examining factors influencing HIV testing acceptance among women in Kenya over the years 1998, 2003, and 2008 also is consistent with this result (Achia & Obayo, 2013). It indicates that women with lower educational attainment are less significantly inclined to experience HIV testing in the sub-Saharan African region. The 2014 LDHS shows that the prevalence of HIV in Lesotho is elevated among women, with a rate of 30%, compared to men, where the rate is 19%. Women's educational attainment is vital for an HIV prevention perspective as well. The prevention of HIV in women is also crucial as it can lead to mother-to-child transmission of HIV (PMTCT), emphasizing the need for careful consideration.

Men living in rural areas had lower OR of an uptake in HIV testing compared to those in urban areas, but place of residence was not a statistically significant factor in the model for women. This result is align with the prior finding from the other studies (Adugna & Worku, 2022; Leta et al., 2012). The reason why men in urban areas are higher odds could be that HIV testing services are more available to access than rural areas. Also since men living in urban areas are more likely to get sexually transmitted infections or engage in risky sexual behavior, there is a higher likelihood of regularly checking their HIV status through HIV testing (Adugna & Worku, 2022).

Unlike the study hypothesis, HIV prevention knowledge, sexual behavior, and women's empowerment are not statistically proved significant for both men and women. While these results align with a few prior finding (Sonny, 2022) but are not consistent with the majority of other results (Achia & Obayo, 2013; Koku, 2011; Sambisa et al., 2010). The result could be due to the restricted survey questions in our study, leading to limitations in interpreting the results. For instance, it seems challenging to analyze HIV prevention knowledge based on a single ques-

tion like, 'Healthy-looking person can have HIV'. Therefore, various perspective questions related to modifying factors such as HIV prevention knowledge, sexual behavior and women's empowerment is needed in further research.

This paper also shows that HIV-related stigma is negatively associated with HIV test uptake for both women and men, supported by prior research (Corno & de Walque, 2013). Although Lesotho is said to have improved the level of HIV-related stigma recently, from 42% of women and 33% of men expressing fully acceptance for people living with HIV in 2009 and 46% of women and 36% of men in 2014, stigma still acts as a barrier in HIV testing and access to HIV treatment (Ministry of Health & ICF International, 2016). Based on the combined results from our study and the current statistic, it seemed reasonable to consider 'social rejection' as the major barrier of the societal compliance toward HIV prevention and treatment. This led to the subsequent implication to implement first not anti-stigma but embracing interventions to alleviate social rejection; still highly significant in both sex group. For instance, we suggest interventions with package services not only to ameliorate HIV prevention knowledge but also to increase accessibility for the whole population. Promoting HIV testing as regular health assessment as well as disseminating HIV testing tools like a home-based test kit. (Mantell et al., 2014) As more and more women take a HIV test as a part of antenatal care, it involves not only prompting them to receive HIV testing but also encouraging their partners to get tested.

As DiCarlo et al. (2014) pointed out, Lesotho has significant traditional gender and power dynamics that can be understood as a barrier for HIV testing for men, and therefore more studies are needed to develop effective strategies that inform and involve men. For health intervention, precise and comprehensive translation and interpretation is thus needed to discover those embedded and unconsciously constructed societal perception against health intervention.

As the first step in the HIV treatment cascade, one cannot underestimate or overestimate the factors associated with an uptake in HIV testing. We need to confront what we think we know and what we have not thought. HIV-related stigma, HIV knowledge, and sexual behaviors are one of those areas we easily think we know enough but in order to develop effective policies and intervention, we need to carefully examine and analyze all relevant factors in gender-specific per-

spectives from different angles.

Ⅵ. LIMITATION

There are several limitations and challenges which had been encountered during the research. First of all, the analysis using the secondary data source in the cross-sectional design has issues with the limits of the causal inference. Secondly, variables from responses of survey questions are likely to be affected by self-reporting bias or recall bias. The measure of an uptake in HIV testing ("ever been tested"), in this sense, is selected to avoid potential confusion caused by giving a specific time frame ("past 12-month from the last survey"). Based on previous studies, thirdly, an uptake in HIV testing is likely to be influenced by factors, which the study cannot cover, beyond the individual level; including interpersonal factors, the number of community health workers, health care delivery system, health policies related to HIV/AIDS, and international aids or campaigns regarding HIV/AIDS. that were not measured here. Moreover, it is challenging to repeat the research process back and forth due to the availability and composition of data source. The study question and design have been changed many times either as the variable contains not enough number of responses, especially for those sensitive or tricky questions or as the variable does not measure in the same way as the study is designed.

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