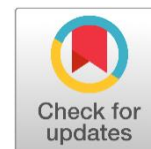




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# Comprehensive knowledge and positive attitude of married men regarding HIV/ AIDS in Pakistan: Evidence from Demographic and Health Survey 2017-18

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### ABSTRACT

Acquired Immunodeficiency Syndrome (AIDS) is a life-threatening condition due to Human Immunodeficiency Virus (HIV) infection, and remains a major public health issue, mostly in under-developing countries. Pakistan is the second largest country in South Asia with a significant increase in HIV cases. This research explores the comprehensive knowledge regarding HIV/AIDS, dispelling myths and their positive attitude toward people living with HIV/ AIDS (PLWHA) in Pakistan. The study is based on the secondary dataset of married men of the Pakistan Demographic and Health Survey (PDHS) 2017-18. The sample size was comprised of 3,690 married men, within the age bracket between 15 to 49 years. The descriptive analysis, cross-tabulation, and logistics regression were applied. The results illustrated that more than 67 percent of Pakistani married men have heard about HIV/ AIDS, however, among these men, 50.6 percent have comprehensive knowledge regarding HIV/AIDS, and 54.1 percent have a positive attitude toward PLWHA. The result of logistic regression analysis highlighted that married men who have lower knowledge regarding HIV/AIDS belong to the provinces of Khyber Pakhtunkhwa, and Sindh, aged between 20 -24 years, having primary level education and working in the sector of agriculture. Further, logistic regression analysis found that there are lower odds of positive attitude among those married men, who belong to the region of Gilgit Baltistan, Federal Administrated Tribal Area, aged between 20-24 years, having a primary level of education and working in the sector of agriculture. Finally, this research concluded that individuals' socio-demographic traits are critical to understanding and addressing the prevailing myths to combat HIV/AIDS in Pakistan.

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## 1. INTRODUCTION

Acquired Immunodeficiency Syndrome (AIDS) is a chronic condition, caused by Human Immunodeficiency Virus (HIV)

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infection. The first case of HIV was reported in 1980, followed by more than 75 million cases of HIV/AIDS (Farman et al., 2022). According to the UNAIDS' statistics, 38 million people are HIV positive worldwide, in 2019, 1.7 million people were newly infected with HIV worldwide and 690,000 people died from AIDS-related illnesses in 2019 (Gul et al., 2022). Including approximately 35.1 million adult people and 1.8 million children (Chowdhury & Chakraborty, 2017). More than 0.5%, a significant portion of the global population is infected. There are approximately 5,000 new infections occurring every day, 500 of which are children. Currently, the number of deaths per 100,000 people is 11 (Rukhsana Khan, Arshia Bilal, 2019). Among these, almost 1.8 million are most recently affected with HIV infection. During the first decade, HIV cases were more

prevalent among individuals who had received or gave blood products that were contaminated (Cao et al., 2020). Across the world, 35 million people passed away during the initial epidemic of AIDS-related illness, while 21 million people received HIV antiretroviral therapy (Murwira et al., 2021).

In many countries of the Asia and Pacific region, there are higher stereotypical beliefs associated with the spread of HIV/AIDS, resulting in 1.5 million infected people with HIV. According to the latest estimates, the prevalence of HIV is 0.2 percent, including 1.82 million women above 18 years of age and 1.65 million men above 20 years of age (Iqbal et al., 2019). In the context of Pakistan, there are around 165,000 people infected with HIV (Suantari, 2021). The second highest prevalence of HIV within the region, following India and Nepal. There has been a notable surge in HIV transmission in recent years, particularly among individuals who engage in drug use and those involved in sex work (Chaudhary & Kakchapati, 2022).

Amongst these, only 22,333 individuals have been registered as HIV-positive and 12,046 are on antiretroviral therapy. On the whole, the increasing number of HIV/AIDS cases is alarming, which highlights the gap in terms of a lack of health education, health promotion, and medical facilities for preventing the spread of HIV (Govender et al., 2021). Encouraging open communication, providing accurate information, and addressing stigmatization are pre-requisite for prevention of HIV/AIDS, followed by diagnostic testing. The role of males is particularly meaningful in the patriarchal society of Pakistan, being authoritarian and gender role stress. That's the reason, the mostly males do not ask for help as their traditional masculine norms discourage them from seeking necessary support, even for health issues, including HIV/AIDS (Samo et al., 2017).

Married men may also be reluctant to seek information or support related to HIV/AIDS due to fear of stigma and discrimination, both within their community and within their relationships. This fear can be particularly strong in cultures or societies, where HIV/AIDS is highly stigmatized (Liu et al., 2020). Several factors, including their education level, age, and exposure to relevant information, according to studies, influence individuals' knowledge and attitude toward HIV/AIDS, for instance, the Oluغبenga-Bello study in Nigeria indicated that men with greater education levels had more chances to understand HIV/AIDS formally (Zhang et al., 2022). Concludes that men who had media exposure to the material of HIV/AIDS had more chances to have proper situation awareness (Acharya et al., 2022).

In a South African study, researchers discovered that men with greater levels of education, those who had had HIV testing, and counseling were more likely to be knowledgeable about the spread of HIV/AIDS and its prevention (Malik et al., 2023). Many males, however, continued to have false notions about the virus, such as the notion that HIV/AIDS could be treated with conventional medicine or that only specific demographics, for example, the people who engaged in sexual activities and men who are homosexual, were susceptible to infection (Laari & Alhassan, 2022).

Another study showed that only 29 percent of married women, those who had age brackets between 15 and 49 years, and all women are employed, compared to 98 percent of married men between the age bracket of 15 and 49 years (Navidi et al., 2022). Only half of the women earning cash can make independent spending decisions, according to a

Karachi survey on fishermen's knowledge of HIV/AIDS (Hussain et al., 2021). Seven out of ten women reported earning less than their husbands did. Among HIV-positive women, 44.9 percent are unemployed, compared to 32 percent of men. The majority, of fishermen had not heard of HIV/AIDS, the number rate was 61.6 percent and 38 percent said that healthy-looking people have a chance to transmit the virus HIV. 50.5 percent of fishermen said that HIV is only transmitted through sexual intercourse without any use of contraception. 44.4 percent, of respondents, know, that HIV has been transmitted through a stuck needle or injury and 24.6 percent know that HIV transmits through the placenta (Khan et al., 2021).

Another study pointed out a higher rate of prevalence linked to the difficulties of sexual health among youth age of the Iranian population, involving unwanted pregnancy and pre-marital sexual relationships exposure to STDs in later life, reason is that sexuality is not discussed with anyone not considered part of reproductive health knowledge (Mirzapour et al., 2022). The results illustrate that frequently there is low and inaccuracy information available in Iranian society on the health of sexual and reproductive and Eighty-five numbers of Iranian youth age of people had a limited level of knowledge about health of reproductive and sexual. As a result, represents that across the different nation-states, the sexual and reproductive health of men is a major public health issue. According to study, Iranian men can play a crucial role in the prevention of HIV/AIDS and other sexually transmitted diseases (Sadarang, 2022).

There for the aims of this research was to evaluate the level of comprehensive knowledge among married men pertaining to HIV/AIDS, as well as to explore the favorable attitudes exhibited by married men towards people living with HIV/AIDS (PLWHA) in the context of Pakistan.

## 2. METHODS

### The Source of Data

The research is conducted using a secondary dataset from the Pakistan Demographic and Health Survey (PDHS) of 2017-18, according to a series of international Demographic and Health Surveys (DHS), which is the fourth wave of the survey. Along with the economic support of United States Agency for International Development (USAID), the role of Pakistan Bureau of Statistics (PBS), and technical support from Inner-City Fund (ICF), National Institute of Population Studies (NIPS) has accomplished Pakistan Demographic and Health Survey (PDHS).

The PDHS 2017-18 has followed the stratified sampling design in two stages. There were eight regions, which were divided separately on the basis of type of residence such as urban and rural areas, through stratification. Entirely, there were 16 sampling strata formed. Through the selection process of two stages, each stratum of samples was selected independently. There are clusters of 580 (enumeration blocks) in the first stage. Selection of residential households on the number of including. In the second stage, systematic sampling was used to select households, where 28 households were selected, hence in total approximately 16,240 households were the total size of the sample. At the data processing of the NIPS office, the selection of households was carried out centrally. The teams in the survey interviewed only the pre-selected households. At the stage of implementation, there were no changes and no replacements to the pre-selected households, which did not

include the element of bias. At data processing of the NIPS office, the selection of households was carried out centrally. Only pre-selected households were interviewed by the team in the survey. At the stage of implementation, the element of bias which not involved by no changes to the pre-selected households.

### Data Collection

In the PDHS 2017-18, six questionnaires were used in the method of data collection, including a questionnaire for women, a men's questionnaire, a fieldworker questionnaire, a biomarker questionnaire, a household questionnaire, and a community questionnaire. The present study employed a questionnaire specifically designed for male participants, encompassing a range of inquiries pertaining to the knowledge, awareness, and attitudes of married men towards individuals living with HIV/AIDS (PLWHA).

The data gathering process spanned from November 22, 2017 to April 30, 2018, and was carried out by a total of 14 teams. Each team consisted of one field editor, one supervisor, one male interviewer, and three female interviewees. Moreover, the organizational structure of the International Conference on NIPS includes a central core team, as well as coordinators at the provincial level and quality controllers. The ICF maintains a strict oversight of these teams. Simultaneously, the initiation of data processing activities, including the editing and entry of comprehensive responses into the questionnaire, was undertaken. The utilization of the Census and Surveys Processing (CSPRO) software package proved to be advantageous in facilitating the tasks of data entry and answer editing.

In the geographical boundaries of Pakistan, a total of 11,869 houses out of 12,338 were successfully surveyed, resulting in a response rate of 96 percent. The survey revealed that a significant proportion of ever-married men aged 15 to 49 years, specifically 87 percent, participated in the study. This figure represents approximately one-third of the total sample homes.

### Measures

#### Independent Variables

The analysis incorporated a range of socio-demographic indicators as independent variables. The participants in this study encompass a range of educational backgrounds, spanning from individuals with no formal education to those who have completed primary education and beyond. The age distribution of the respondents is diverse, with distinct categories such as 15-19 years, 20-24 years, 25-29 years, and so forth. The sample includes individuals from various regions and provinces within the geographical boundaries of Pakistan. Moreover, the areas are classified as either urban or rural based on their geographic characteristics. Men were engaged in various occupations, including professional and management roles, agricultural work, as well as skilled and unskilled labor. Furthermore, the household's wealth index was categorized into five distinct classes, namely the wealthiest, wealthier, middle, poorer, and lowest. The measurement of mass media consumption for each participant was conducted by assessing the frequency of engaging with newspapers, radio broadcasts, and television programs.

### Dependent Variables

The present study examines two primary outcome variables: the extent of married men's comprehensive knowledge on HIV/AIDS and their overall attitude towards PLWHAs. The study aimed to investigate the level of awareness and knowledge of HIV/AIDS among married males. Subsequently, additional inquiries were made to assess their understanding of several aspects linked to HIV/AIDS, dispelling myths and misconceptions.

Comprehensive knowledge of HIV/AIDS among married men was assessed through a set of five questions. Out of these five questions, three were successful in dispelling misconceptions held by the respondents. These misconceptions included the belief that HIV can be transmitted through sharing food with an HIV-positive individual, through mosquito bites, and that individuals who appear healthy can still be infected with HIV. The two remaining questions pertain to the identification of two techniques for preventing HIV/AIDS infection: consistently using condoms during sexual intercourse, and engaging in a monogamous relationship with an uninfected partner to reduce the chance of HIV transmission.

The responses are classified as affirmative and negative for the aforementioned set of five questions and the subsequent set of four questions. In the present study, the responses indicating a negative sentiment were transformed into numerical values represented by the digit "0", whilst the responses indicating a positive sentiment were transformed into numerical values represented by the digit "1".

The complete knowledge score ranged from zero to five. Among the five questions, it was observed that male respondents were prone to wrongly marking their answers as a score of 0, whereas those men who responded accurately indicated their scores within the range of 1 and above. All the above five questions are computed, in order to categorize knowledge into lower and higher levels, a cut-off value was determined by calculating the mean value. The cut-off value ranged from 3 to 5 for higher knowledge, while it ranged from 0 to 2 for lower knowledge.

In order to assess the favorable disposition of married males towards PLWHA, a series of four inquiries were asked. These inquiries aimed to gauge respondents' perspectives on purchasing vegetables from a shopkeeper known to have HIV, engaging in negative conversations about PLWHA, endorsing the attendance of HIV-infected children in schools, and harboring concerns about contracting HIV through interaction with the saliva of PLWHA. A scale ranging from zero to four is utilized to measure the favorable attitudes of men towards PLWHAs.

All the four questions are computed, in order to illustrate a negative attitude towards the aforementioned four questions, a score of 0 represents complete negativity, whereas a score ranging from 1 to 4 indicates a positive perspective. The dichotomization of values occurs when mean values are used as a cut-off point to distinguish between positive and negative attitudes. The respondents' attitudes can be categorized into two ranges: 0-2 for those with negative attitudes and 3-4 for those with positive views.

### Ethical considerations

The present study employed secondary data for the purpose of analysis. In order to gain access to the dataset on

the DHS website, it is mandatory for researchers to complete the registration process. This entails providing relevant personal information and specifying the title of their research project. Additionally, researchers are required to provide a written paragraph that exceeds a length of 300 words, outlining the objectives and scope of their research. Subsequently, researchers articulate the primary motivations for their intent to undertake this study. Upon successful registration of their accounts, they will gain convenient access to the datasets, which are accessible in various formats on the official website of the DHS.

### Statistical analysis

The secondary analysis in this study employed IBM SPSS version 25. The data was processed using the SPSS program, and descriptive statistics were employed to analyze the frequency and percentage of socio-demographic characteristics, mass media exposure, comprehensive knowledge on HIV/AIDS, and the attitudes of married males towards PLWHA. In order to examine the importance of the variables, a cross-tabulation analysis and chi-square test were conducted. A significance level of  $p < 0.05$  was selected. Logistic regression were employed to ascertain the association of key variables with comprehensive understanding on HIV/AIDS of married males concerning HIV/AIDS and their attitudes towards PLWHAs.

## 3. RESULTS

Table 1 presents an overview of the socio-demographic characteristics of the respondents, specifically focusing on a total of 3,690 male participants aged between 15 and 49 years. The findings revealed that 23.1 percent of married males residing in the province of Punjab participated in the study, while the lowest proportion of respondents was observed in Gilgit Baltistan, accounting for 5.7 percent. The majority of married males residing in urban areas, specifically 51.0 percent, fall within the age range of 30 to 34 years, accounting for 20.7 percent of this demographic. A majority of the participants, specifically 35 percent, possessed a secondary level of education, but a notable proportion of 20.5 percent exhibited a skilled background. Approximately 17.1% of the participants reported having access to mass media when engaging in television viewing. Furthermore, 21.7% of the respondents identified themselves as belonging to the lower socioeconomic stratum, whilst 21.3% identified themselves as belonging to the higher socioeconomic stratum. The results indicate that a majority of male participants, specifically over 67 percent, demonstrated awareness of HIV/AIDS. Out of the aforementioned group, it was found that 50% of married men possessed a substantial level of comprehensive knowledge pertaining to HIV/AIDS, while 54% exhibited a favorable attitude towards those who are living with HIV/AIDS.

**Table 1**

Socio-demographic characteristics of men from PDHS 2017-18 (n=3,690)

Characteristics	Frequency (f)	Percentage (%)
<b>Provinces</b>		
Punjab	853	23.1
Sindh	778	21.1
Khyber Pakhtunkhwa	505	13.7
Balochistan	522	14.7
Gilgit Baltistan	210	5.7
Islamabad	265	7.2
Azad Jammu Kashmir	336	9.1
Federal-Administered Tribal Areas	222	6
<b>Type of residence</b>		
Urban	1,884	51
Rural	1,807	49
<b>Respondent age</b>		
15 to 19 years	49	1.3
20 to 24 years	293	7.9
25 to 29 years	672	18.2
30 to 34 years	765	20.7
35 to 39 years	736	19.9
40 to 44 years	580	15.7
45 to 49 years	596	16.1
<b>Educational level</b>		
No Formal	869	23.5
Primary	628	17
Secondary	1,323	35.8
Higher	871	23.6
<b>Wealth index</b>		
Poorest	672	18.2
Poorer	801	21.7
Middle	708	19.2
Richer	725	19.6
Richest	785	21.3
<b>Occupation</b>		
Managerial/ Professional	587	15.9
Agriculture	578	15.7
Skilled	748	20.3
Unskilled	718	19.5
<b>Mass media</b>		
Reading newspaper	700	19
Listening to radio	477	12.9
Watching television	630	17.1
<b>HIV/AIDS knowledge and attitude-related characteristics (n= 3,690)</b>		
<b>Respondent's ever heard of HIV/AIDS</b>		
Yes	2,486	67.4
No	1,204	32.6
<b>Respondent's comprehensive knowledge of HIV/AIDS</b>		
Yes	1,864	50.6
No	617	16.7
<b>Respondent's attitude toward people living with HIV/AIDS</b>		
Yes	1,997	54.1
No	488	13.2

Table 2 shows the cross-tabulation of different socio-demographic factors and the confounding variable with the dependent variables, including the comprehensive knowledge of married men regarding HIV/ AIDS and attitudes towards PLWHA. Married men exhibited a higher level of comprehensive knowledge regarding HIV/AIDS among those men living in urban areas within the provinces of Punjab and Sindh, aged between 30 and 34 years, with

secondary education, and belonging to the wealthiest wealth level. Men working in professional/managerial positions exhibit higher comprehensive knowledge regarding HIV/AIDS. The results regarding married men's attitudes towards PLWHA highlight that men with positive attitudes towards PLWHA are from the provinces of Sindh and Punjab, residing in urban areas, aged between 30 and 34 years, with secondary education, and belonging to the wealthiest wealth index.

Results of chi-square also elaborated a statistically significant association ( $p < 0.05$ ) of comprehensive knowledge and men's attitude towards PLWHA. Further, strong statistical association ( $p < 0.05$ ) between higher and lower comprehensive knowledge with the provinces, level of education, occupation, exposure to mass media, and results of men's positive attitude and negative towards PLWHA showed a statistical significance with the provinces, level of education and exposure to mass media.

**Table 2**

Association of comprehensive knowledge of married men regarding HIV/AIDS and attitude towards People living with HIV/AIDS with their socio-demographic factors and mass media

Characteristics	Men's comprehensive knowledge regarding HIV/AIDS			Men's attitudes toward people living with HIV/AIDS		
	High knowledge	Low knowledge	p-value	Positive attitude	Negative attitude	p-value
Provinces						
Punjab	26.6	23.8	0.00	21.3	27.0	0.00
Sindh	15	18		24.2	13.7	
Balochistan	11.9	10		15.6	10.4	
Khyber Pakhtunkhwa	13.5	21.1		14.5	15.6	
Gilgit Baltistan	5.3	3.4		2.3	5.5	
Islamabad	9.9	6.2		10.7	8.6	
Azad Jammu Kashmir	11.1	11.2		8.0	11.9	
Federal-Administrated Tribal Areas	6.7	6.3		3.5	7.4	
Geographical location						
Urban	59.9	57.4	0.27	61.5	58.7	0.26
Rural	40.1	42.6		38.5	41.3	
Respondent's age						
15 to 19 years	0.5	1.0	0.17	1.0	0.5	0.29
20 to 24 years	5.6	7.8		7.6	5.8	
25 to 29 years	16.3	18.5		17.6	16.7	
30 to 34 years	21.8	20.9		21.7	21.5	
35 to 39 years	21.6	19.9		21.9	20.9	
40 to 44 years	16.8	16.9		16.2	17.0	
45 to 49 years	17.4	15.1		13.9	17.5	
Level of education						
No formal education	10.2	14.4	0.00	13.5	10.7	0.03
Primary	12.7	16.2		16.4	12.8	
Secondary	42.9	40.8		39.1	43.2	
Higher	34.2	28.5		30.9	33.4	
Occupation						
Professional/managerial	23.9	16.7	0.00	18.4	23.1	0.31
Agriculture	4.2	3.7		4.5	4.0	
Skilled	17.9	20.3		20.2	18.1	
Unskilled	10.3	9.4				
Exposure to Mass media						
Yes	55.2	42.5	0.00	47.7	53.2	0.03
No	44.8	57.5		52.3	46.8	
Wealth index						
Richest	29.8	26.4	0.64	31.8	28.3	0.19
Richer	23.8	25.8		23.2	24.4	
Middle	21.1	18.2		20.9	20.3	
Poorer	17.4	19.9		14.8	18.7	
Poorest	7.9	10.2		9.4	8.2	

**Table 3**

Bivariate and Multivariate regression of men's comprehensive knowledge with their socio-demographic factors and mass media

Characteristics	Men's comprehensive knowledge					
	Bivariate			Multivariate		
	OR	CI (95%)	p-value	AOR	CI (95%)	p-value
<b>Provinces</b>						
Punjab	1			1		
Sindh	0.74	0.56-0.99	<b>0.04</b>	0.68	0.50-0.93	<b>0.01</b>
Khyber Pakhtunkhwa	0.57	0.43-0.76	<b>0.00</b>	0.62	0.46-0.86	<b>0.00</b>
Balochistan	1.05	0.75-1.47	0.74	1.01	0.70-1.44	0.95
Gilgit Baltistan	1.38	0.83-2.29	0.20	1.22	0.71-2.10	0.46

Islamabad	1.44	0.97-2.14	0.69	1.31	0.86-1.98	0.19
Azad Jammu Kashmir	0.88	0.64-1.23	0.48	0.81	0.58-1.82	0.24
Federal-Administrated Tribal Area	0.95	0.63-1.42	0.80	1.17	0.73-1.14	0.46
<b>Geographical location</b>						
Rural	1			1		
Urban	0.90	0.75-1.08	0.27	0.91	0.73-1.14	0.43
<b>Respondent's age</b>						
15-19 years	1			1		
20-24 years	1.45	0.49-4.32	0.49	1.39	0.45-4.03	0.56
25-29 years	1.77	0.61-5.09	0.28	1.54	0.51-4.50	0.43
30-34 years	2.09	0.73-6.00	0.16	1.77	0.59-5.27	0.30
35-39 years	2.17	0.76-6.24	0.14	1.84	0.61-5.50	0.27
40-44 years	2.01	0.70-5.69	0.19	1.71	0.57-5.13	0.33
45-49 years	2.33	0.80-6.71	0.11	2.05	0.68-6.19	0.19
<b>Level of education</b>						
No formal education	1			1		
Primary	1.05	0.78-1.55	0.56	1.01	0.71-1.45	0.92
Secondary	1.48	1.11-1.98	<b>0.00</b>	1.25	0.91-1.71	0.16
Higher	1.69	1.25-2.29	<b>0.00</b>	1.31	0.90-1.90	0.15
<b>Occupation</b>						
Unskilled	1			1		
Agriculture	1.27	0.77-2.10	0.33	1.47	0.88-2.46	0.13
Skilled	1.59	0.98-2.60	0.58	1.69	1.01-2.83	<b>0.04</b>
Professional/ managerial	2.35	1.43-3.85	<b>0.00</b>	2.02	1.21-3.39	<b>0.00</b>
<b>Exposure to mass media</b>						
No	1			1		
Yes	1.66	1.38-2.00	<b>0.00</b>	1.42	1.15-1.74	<b>0.00</b>
<b>Wealth index</b>						
Poorest	1			1		
Poorer	1.04	0.77-1.41	0.75	1.00	0.68-1.47	0.98
Middle	1.02	0.76-1.36	0.89	1.32	0.88-1.98	0.17
Richer	1.14	0.84-1.53	0.38	1.03	0.68-1.55	0.88
Richest	1.10	0.82-1.46	0.51	1.09	0.70-1.69	0.69

**Table 4**

Bivariate and Multivariate regression of men's attitude toward PLHWA with their socio-demographic factors and mass media

Characteristics	Men's attitude toward PLHWA					
	Bivariate			Multivariate		
	OR	CI (95%)	p-value	AOR	CI (95%)	p-value
<b>Provinces</b>						
Punjab	1			1		
Sindh	2.23	1.65-3.01	<b>0.00</b>	2.44	1.77-3.38	<b>0.00</b>
Khyber Pakhtunkhwa	1.17	0.84-1.64	0.33	1.81	0.83-1.66	0.34
Balochistan	1.90	1.35-2.66	<b>0.00</b>	2.10	1.46-3.03	<b>0.00</b>
Gilgit Baltistan	0.51	0.26-0.99	<b>0.04</b>	0.61	0.30-1.24	0.17
Islamabad	1.57	1.08-2.29	<b>0.01</b>	1.60	1.08-2.83	<b>0.01</b>
Azad Jammu Kashmir	0.85	0.57-1.27	0.43	0.96	0.63-1.44	0.84
Federal-Administrated Tribal Area	0.59	0.34-1.03	0.06	0.57	0.32-1.01	<b>0.05</b>
<b>Geographical location</b>						
Rural	1			1		
Urban	0.89	0.72-1.09	0.26	1.06	0.83-1.36	0.61
<b>Respondent's age</b>						
15-19 years	1			1		
20-24 years	0.38	0.12-1.17	0.09	0.34	0.10-1.09	0.07
25-29 years	0.51	0.17-1.54	0.23	0.47	0.15-1.47	0.19
30-34 years	0.49	0.16-1.47	0.20	0.42	0.13-1.33	0.14
35-39 years	0.51	0.17-1.52	0.23	0.43	0.14-1.37	0.15
40-44 years	0.46	0.15-1.40	0.17	0.40	0.12-1.27	0.12
45-49 years	0.63	0.20-1.98	0.43	0.57	0.17-1.86	0.35
<b>Level of education</b>						
No formal education	1			1		
Primary	0.70	0.53-1.02	0.06	0.67	0.45-1.01	<b>0.05</b>
Secondary	0.73	0.52-0.98	0.67	0.78	0.54-1.10	0.16
Higher	1.01	0.70-1.16	0.16	1.08	0.73-1.61	0.67

<b>Occupation</b>						
Unskilled	1			1		
Agriculture	0.62	0.36-1.09	0.09	0.64	0.36-1.14	0.13
Skilled	0.76	0.43-1.29	0.30	0.78	0.40-1.35	0.33
Professional/ managerial	0.89	0.49-1.60	0.71	1.08	0.51-1.89	0.97
<b>Exposure to mass media</b>						
No	1			1		
Yes	0.80	0.65-0.98	<b>0.03</b>	0.82	0.66-1.03	0.09
<b>Wealth index</b>						
Poorest	1			1		
Poorer	0.68	0.45-1.03	0.07	0.72	0.46-1.13	0.16
Middle	0.89	0.60-1.32	0.58	1.00	0.64-1.56	0.99
Richer	0.82	0.56-1.21	0.33	0.87	0.54-1.38	0.55
Richest	0.97	0.67-1.41	0.90	1.14	0.70-1.85	0.58

Results from Table 3 illustrate that married men who have lower knowledge regarding HIV/AIDS belong to the provinces of Khyber Pakhtunkhwa (OR: 0.57) and Sindh (OR: 0.74). Results elaborate that men aged between 20 and 24 years (OR: 1.45) had lower odds of knowledge than those who were falling in the age older than 25 years (OR: 1.77). In terms of educational level, the higher-level of married men had higher odds of comprehensive knowledge (OR: 1.69), and secondary educational status, had a higher level of knowledge (OR: 1.48) than education level of primary (OR:1.05). Those married men who fell in the category of professional/managerial positions or skilled workers had higher levels of knowledge (OR: 2.35, 1.59) than those men who worked in the sector of agriculture (OR: 1.27).

Table 4 illustrates that men who belong to the region of Gilgit Baltistan (OR: 0.51), Federal Administrated Tribal Area (OR:0.59), older than 20 years have lower odds of positive attitudes towards PLWHA (OR: 0.38) and, having a primary level of education (OR: 0.70). In terms of occupation, there is a higher chance of positive attitudes amongst those who have positions of professional/managerial (OR: 0.89) than positions of skilled positions (OR:0.76) and agriculture (OR:0.62). Moreover, the respondents who belong to the provinces of Sindh (OR: 2.23), Balochistan (OR:1.90), have a higher level of education and are older than 45 years have more positive attitudes towards PLWHA (OR: 1.01,0.63).

## Discussion

This study aimed to understand the relationship between the different factors, related to socio-demographic characteristics with the comprehensive knowledge of married men regarding HIV/AIDS and positive attitudes towards PLWHA in Pakistan. The study highlighted that 67.4 percent of Pakistani men have ever heard about HIV/AIDS. It is indicated that 32.6 percent of married men have not heard about HIV/AIDS. Of those men, who have heard about HIV/AIDS, more than 50% have a higher level of knowledge regarding HIV/AIDS while only 54.1 percent of men are informed about the positive attitude towards PLWHA.

The results of this study are consistent with the past era of Pakistani studies and other countries such as Asian and South African countries, where the study has shown that respondents who are married men have a better level of knowledge about HIV/AIDS and positive attitude towards PLWHA (Naif et al., 2019). Likewise, some studies were conducted in the province of Karachi, Pakistan and the findings of the study showed that there is a higher level of knowledge among youth age of people regarding HIV/AIDS.

These results also highlight the gaps and the factors, which are leading reasons behind the low knowledge of men about HIV and biased attitude towards PLWHA, which is needed to highlight for redressal.

The research has found that the result of the relationship between socio-demographic factors and comprehensive knowledge of HIV/AIDS is high from the province of Islamabad, age more than 45 years, having higher education, professional/ managerial positions, and belongs to the richer (Suantari, 2021). Some studies are similar to the findings of the research, which has been conducted in Ethiopia, India, and Bangladesh. Similar results have been highlighted in the study regarding the attitude of men towards PLWHA (Malik et al., 2023).

The findings of this study highlight that a massive number of men from the province of Sindh, who have higher education and men aged between 45-49 years, in professional/ managerial positions had positive attitudes toward PLWHA. These results are also consistent with the different research which had conducted within African countries.

The results also advised there is a need to focus on those married men who have low knowledge of HIV/AIDS, from the province of Khyber Pakhtunkhwa, aged between 20-24 years, working in agriculture and having primary education. Therefore, there are necessary steps, which will bring improvement in their comprehensive knowledge and attitude towards PLWHA through different awareness campaigns and sessions. The contribution of men is associated with their age, education; occupation, and wealth status while mass media is shown through newspapers, radio, and television. Healthcare and psychological well-being are important implication, which contributes to the decision-making of men for example, in circumstances of HIV/AIDS, HIV is such a disease that globally it affects men extremely and is observed. Those men with a higher level of comprehensive knowledge and a positive attitude towards PLWHAs are more associated with a higher level of education and the richest level of wealth (Zhang et al., 2022). This research corresponds to the findings of country-wide research, highlighting the lower level of knowledge of ever-married women in Pakistan (Iqbal et al., 2019).

The study found that those married men who are less likely to show a positive attitude towards PLWHA are more associated with primary education, belong to a poorer level of wealth, and have agricultural occupations. The different factors of men's demographics play an important role in addressing the infection impact, which mentioned that there is a need to improve the health status, of this study of

findings (Samo et al., 2017). Lastly, the key findings of this study accepted the importance of the treatment, causes, and prevention of HIV/AIDS is getting comprehensive knowledge as completely, which is realistic.

#### 4. Conclusion

The results of the study are encouraging given that comprehensive knowledge of HIV/AIDS and positive attitudes towards PLWHA are influenced by education, occupation, classification of area, and wealth index. For the control and prevention of HIV, comprehensive knowledge and positive attitudes of married men are the main leading sources. There should be required efforts to reduce the wrongful beliefs and negative interactions of married men toward PLWHA.

Policymakers' role as highlighted by the research, especially the initiative of AIDS control at the level of tehsil as well as at the level of city in Pakistan, is to ensure the implementation of plans is actively through monitoring and adequate resources for efficiency in the situation before when making the designs. It will be achieved through launching awareness sessions in massive numbers as well as campaigns in local languages through support and healthcare mechanisms and the inclusion of social media. There is a need for local NGOs and social workers they go to the areas especially where mobility is designed in such a way of awareness campaigns by keeping in view cultural values and cultural environment. At a broad level between the extensive communities, they also may involve promoting the education of health.

#### Recommendations

Based on the findings, it is suggested that awareness about comprehensive knowledge of HIV/AIDS are essential to eliminate the myths of different individuals and promote positive behavior. Mass media campaigns in the local languages at regular intervals would be instrumental in reaching out to the audience widely, particularly in rural areas, where men lack access to resources.

In addition, the government and civil society organizations should work together to create a supportive and inclusive environment for people living with HIV/AIDS. This includes providing access to essential services such as medical care, support groups, and counseling, and ensuring that PLWHA is protected from discrimination and stigma. Furthermore, it is important to involve the community in the prevention and response efforts, as community-based organizations should play a significant role in addressing the stigmatization associated with HIV/AIDS. They can provide peer education and support, and work to create an inclusive environment where PLWHA are accepted and supported (Sadarang, 2022).

The positive attitude of married men towards PLWHA is more emphasized through short lectures, conferences, awareness sessions, and one-to-one counseling sessions that can also be organized for married men as generally, how to overcome the misconceptions interlinked to HIV/AIDS. The research concluded that raising campaigns sessions the involvement with mass media, which will bring a transformation in such a way that educating and informing on HIV/AIDS.

#### Author's Contribution

MA and SI conceptualized the study. PJ led the introduction and edited the professional English services of the manuscript. MA led the analysis, methods, measures, discussion, conclusion and in-text citations. SI supervised the manuscript writing.

#### Data availability

Secondary dataset from PDHS 2017-18.

#### Conflict interests

The authors declare no conflict of interest.

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