

RESEARCH ARTICLE

# Factor Associated with HIV/AIDS knowledge among males: Findings from 2017-18 Pakistan Demographic and Health Survey

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## Abstract

Acquired immune deficiency syndrome (UNAIDS) has risen as the serious public health problem across the world. Knowledge about HIV/AIDS is the cornerstone for prevention and treatment. Research is needed to explore the attitude and the effect of different demographic, geographic, and socioeconomic and media exposure factors on males knowledge about HIV in Pakistan. In this study, latest secondary data are used from Pakistan Demographic and Health Survey 2017-18. Sample results show that the majority of the respondents (70%) have knowledge about AIDS. Regression Modeling reveals that man's knowledge about HIV/AIDS is associated with age, place of residence, educational level, wealth index, ethnicity and media exposure factors. Males of age group 35-39, with higher education, belonging to Pukthoon ethnicity, having exposure to mass media on a daily basis and belonging to richest wealth quintile has high Knowledge of HIV/AIDS. For example, the regression model predicts that men between the ages of 35 and 39 from Islamabad who live in urban areas, have higher education, are of Pukhtoon ethnicity, are the head of the household, belong to the richest quintile, work in professional occupations, and use media exposure factors on a daily basis would have probability of 97% of having knowledge of HIV/AIDS. But there is still need to focus to increase the men's knowledge of HIV/AIDS.

**Keywords:** Awareness; Knowledge of AIDS; Logistic regression; PDHS 2017-18

## Introduction

Globally, most of the disease has found a cure. AIDS (“Acquired immune deficiency syndrome”) is one of that syndrome, which have not found medication till now. This disease is a global pandemic (Cohen *et al.* (2008)). In 2020, about 37.7 million people agonized from this disease, approximately 57% are men infected with HIV (“Human Immunodeficiency Virus”). There were about 680,000 deaths from AIDS in 2020 (UNAIDS (2021)). Global HIV-related deaths peaked in 2006 at 1.95 million (95 percent Confidence Interval (CI) 1.87–2.04), and afterwards it continually fell to 0.95 million (CI 0.91–1.01) in 2017. Global antiretroviral therapy coverage increased from 2.98 million (2.44–3.58) in 2006 to 2.18 million (2.07–2.29) in 2017. The number of new HIV infections peaked in 1999 (3.16 million), and has since been steadily decreasing (Frank *et al.* (2019)).

Discrimination and stigmatization against people living with HIV/AIDS (PLWHA) are caused by a societal misunderstanding of the virus's transmission mechanisms, as well as an overemphasis on culturally unacceptable behaviors as a means of virus transmission (Klein, Karchner and O'Connell (2002); Liamputtong (2013); Mugisha (2019); Suantari (2021)). The general public has

a number of misconceptions about AIDS. Misconceptions about the disease are growing as a result of a mix of factors, including widespread ignorance and misunderstanding of scientific facts on the infection's disease. People learn about things, behaviors, and other topics from their surroundings, which mean that patient opinions of their illness are always stigmatized. People are more concerned about the disease's stigma than the disease itself. Due to the stigma associated with AIDS, people are generally unaware about the primary sources of infection, as well as how the illness spreads or transmits; as a result, patients are more prone to have stigmatizing thoughts (Rehan *et al.* (2016); Rasool and Javed (2016)). The cultural factors such as religious, spiritual, and ethical values influence the spread of the AIDS epidemic as well as efforts to prevent its occurrence and perpetuation (Hare and Villarruel (2007)). The religious leaders' perspectives on PLWHA vary, they believe they have a responsibility to help in the prevention of AIDS (Abu-Moghli *et al.* (2010))

Numerous studies in both developing and developed nations have been undertaken to investigate the association between various risk factors and accurate HIV transmission knowledge (Letamo (2007); Rahman, Kabir and Shahidullah (2009); Rauf *et al.* (2010); Ochako *et al.* (2011); Mondal *et al.* (2014); Nasir, Imran and Zaidi (2015)).

The number of HIV cases lowers and epidemics are averted when people understand how HIV spreads (Mondal *et al.* (2014)). The first HIV case in Pakistan reported in 1987, and since then the virus has spread fast, posing a threat to Pakistani citizens. There were 97000 persons with HIV positive in Pakistan by the end of the year 2009 (The World Bank (2012)). The number of positive cases increases from 97000 in 2009 to 132000 in 2015. From 2005 to 2015, 8360 to 45,990 HIV infections were reported, with a 17.6% as an annual increase. Also, the death rate is alarming. Previous research has found that there is a general lack of knowledge about AIDS transmission methods and prevention measures, particularly in Pakistan (Farid-UL-Hasnain, Johansson and Krantz (2009); Ali *et al.* (2018), Iqbal *et al.* (2019)).

In this paper statistical exploration of the relationship between HIV/AIDS knowledge and various background characteristics is explored on the male's respondent using data from 2017-18 Pakistan Demographic and Health Survey.

## Data and Methods

In this study secondary data from Pakistan Demographic and Health Survey (PDHS) is used. Information for the current analysis were gathered from the latest (2017-18) fourth round of PDHS. This survey was coordinated by the National Institute of Population Studies (National institute of population studies (NIPS) [Pakistan] and ICF), Islamabad, Pakistan. The Azad Jammu and Kashmir (AJK) and Federally Administered Tribal Areas (FATA) are included in the 2017-18 PDHS. AJK and FATA were not included in the 2012-13 PDHS. The findings of 2017-18 PDHS are typical of the country as a whole, as well as of the country's urban and rural areas separately. Estimates of this survey also representative of four provinces: Punjab, Sindh, Khyber Pakhtunkhwa, and Balochistan, as well as four regions: Islamabad Capital Territory (ICT), FATA, AJK and Gilgit Baltistan (GB). A two-stage stratified sample was used in 2017-18 PDHS. Further details of sample design can be seen in the report of the PDHS (National institute of population studies (NIPS) [Pakistan] and ICF (2019)).

The factors affecting HIV/AIDS knowledge were grouped into seven categories: demographic (respondent's age, gender of household head); socioeconomic (education, wealth index, and occupation); geographic (Region, ethnic origin, and place of residence); and media exposure (newspaper, radio and television). In this study the outcome variable is 'HIV/AIDS Knowledge'. In PDHS ever married men's questionnaire section 7, the question was posed by asking the male respondent: 'have you ever heard of HIV or AIDS?' The response is categorized as "Yes" means having heard of HIV/AIDS and "No" means not having heard of HIV/AIDS. A total of 3634 men

aged 15 to 49 years were found eligible for interview in the survey and 3145 were successfully interviewed. After cleaning the sample for statistical modeling a total of 3124 men's information was used in the present work. In addition, the HIV statuses of 3124 men were unknown in the survey. When the outcome variable is measured at nominal or ordinal level, logistic regression is used to investigate the relationship between the independent and outcome variables. Keeping in view the binary nature of the outcome variable, the binary logistic regression model was used to explore the relationship between the explanatory variables with HIV/AIDS knowledge.

## Results

Univariate and bivariate distribution of the study sample is presented in Table 1. The majority of the respondents have heard about HIV/AIDS (70.6%). Most of the men were in the age group of 30-34 (20%) and fewer (0.9%) were from 15-19 years age group. Most of the men were from the Punjab (25.5%) and fewest from Gilgit Baltistan (7.8%). Respondents who were from Rural (51.4%) were more than the Urban (48.6%). More than 27% of the respondents were found to be without education and 45.4% of the respondents were belonging to the richest class of wealth index. Respondents from Urdu speaking families (9.3%) are less than those of Punjabi speaking families (21.8%) in the study. From the total of the respondents only 2.6 percent were those where females were the heads of the households. From the total of the respondent, 3.5% respondent belongs to Not Working/Households/Domestic class of occupation and 22.7% respondent belong to a skilled manual class of occupation. From the total respondents, 45.3% men were not at all read newspapers. Results show that 64.3% of people do not listen radio. The majority of the respondents (49.4%) watch Television on a daily basis.

In Bivariate analysis, all explanatory variables (age, region, type of Residence, Ethnicity, education, Occupation, wealth index, media factors) are significantly associated ( $p < 0.05$ ) with HIV/AIDS knowledge except sex of household head ( $p$ -value = 0.158).

The final estimated logistic regression model is shown in Table 2. An extensive modeling effort resulted in this model. It incorporates all available covariates that have a significant association with the response variable. Results from table 2 reveals that the knowledge of HIV/AIDS in the age group 20-24 is 46% (OR = 0.54, 95% CI: 0.356-0.830) less as compared to age group 45-49 while holding other factors as constant. Knowledge of HIV/AIDS in respondents from Sindh 58% (OR = 0.428, 95% CI: 0.283-0.648), KPK 62% (OR = 0.38, 95%CI: 0.234-0.634), Gilgit Baltistan 80% (OR = 0.203, 95%CI: 0.111-0.369) and Islamabad 42% (OR = 0.58, 0.348-0.990) are less as compare to people living in Punjab while holding other factors as constant. Men living in rural areas have 29% (OR = 0.71, 95%CI 0.551-0.926) less knowledge about HIV/AIDS as compared to Urban. The odds of HIV/AIDS knowledge were high amongst respondents with primary education (OR = 2.450, 95% CI: 1.848-3.249), secondary education (OR = 3.829, 95% CI: 2.823-5.194) and higher education (OR = 19.066, 95% CI: 10.555-34.442) comparing to those respondents having no education. The respondent from the Pashtu Ethnic group (OR = 2.611, 95% CI: 1.405-4.851) was more likely to have two times more knowledge of HIV/AIDS as compare to the Urdu ethnic group. Richest quintile respondents were more likely to have two times more knowledge (OR = 2.285, 95% CI: 1.649-3.166) about HIV/AIDS as compared to any poorest economic status. Findings also revealed that the respondents who have daily exposure to mass media (Newspaper and Television) were more likely to have knowledge about HIV/AIDS than those who are not. Listening to radio is revealed to be an insignificant factor associated with HIV/AIDS knowledge. More specifically, there are 314 respondents with no knowledge of HIV/AIDS and they do not watch Television or read the newspaper paper compared to 636 respondents with no knowledge of HIV/AIDS and they do not listen to the radio. On the other hand, there are only 97 respondents with knowledge of HIV/AIDS and they do not get information from media (TV, Newspaper, radio).

**Table 1.** Responses of Males on HIV/AIDS knowledge in Pakistan, PDHS 2017-18 (n=3124)

Characteristics	Ever heard of HIV/AIDS		Frequency	Chi-Square	df	P value
	Frequency (%)					
	Yes	No				
<b>Age in 5-year groups</b>						
15-19	7(24.1)	22(75.9)	29	51.456	6	0.000
20-24	139(62.3)	84(37.7)	223			
25-29	342(68.7)	156(31.3)	498			
30-34	462(72.9)	172(27.1)	634			
35-39	449(76.8)	136(23.2)	585			
40-44	398(69.7)	173(30.3)	571			
45-49	402(68.8)	182(31.2)	584			
<b>Region</b>						
Punjab	594(74.5)	203(25.5)	797	98.152	5	0.000
Sindh	480(63.3)	278(36.7)	758			
KPK	365(73.4)	132(26.6)	497			
Balochistan	365(66.8)	181(33.2)	546			
Gilgit Baltistan	142(58.2)	102(41.8)	244			
Islamabad (ICT)	253(89.7)	29(10.3)	282			
<b>Type of place of residence</b>						
Urban	1272(83.8)	246(16.2)	1518	254.541	1	0.000
Rural	927(57.7)	679(42.3)	1606			
<b>Educational level</b>						
No education	306(36.1)	541(63.9)	847	807.974	3	0.000
Primary	351(65.7)	183(34.3)	534			
Secondary	814(81.6)	183(18.4)	997			
Higher	728(97.6)	18(2.4)	746			
<b>Ethnicity</b>						
Urdu	258(88.7)	33(11.3)	291	210.639	6	0.000
Punjabi	517(75.8)	165(24.2)	682			
Sindhi	164(50.8)	159(49.2)	323			
Pashtu	518(81.8)	115(18.2)	633			
Balochi/Brahui	177(54.0)	151(46.0)	328			
Saraiki	213(63.0)	125(37.0)	338			
Others	352(66.5)	177(33.5)	529			
<b>Sex of Household Head</b>						
Male	1272(83.8)	246(16.2)	3044	1.991	1	0.158
Female	62(77.5)	18(22.5)	80			

(Continued)

Table 1. (Continued)

Characteristics	Ever heard of HIV/AIDS		Frequency	Chi-Square	df	P value
	Frequency (%)					
<b>Wealth Index</b>						
Poorest	2137(70.2)	907(29.8)	1160	646.189	2	0.000
Middle	399(73.2)	146(26.8)	545			
Richest	1283(90.4)	136(9.6)	1149			
<b>Occupation</b>						
Not Working/Households/Domestic	77(70.0)	33(30.0)	110	340.871	6	0.000 <sup>a</sup>
Professional/Technical/ managerial	380(93.1)	28(6.9)	408			
clerical/services	305(83.8)	59(16.2)	364			
Sales	395(82.5)	84(17.5)	479			
Agricultural	225(47.2)	252(52.8)	477			
Skilled manual	405(70.2)	172(29.8)	577			
Unskilled	412(58.1)	297(41.9)	709			
<b>Reading Newspaper</b>						
Not at all	678(47.9)	737(52.1)	1415	659.256	3	0.000
Occasionally	810(83.7)	158(16.3)	968			
At least once a week	103(90.4)	11(9.6)	114			
Daily	608(97.0)	19(3.0)	627			
<b>Listening to Radio</b>						
Not at all	1374(68.4)	636(31.6)	2010	12.021	3	0.007
Occasionally	671(73.7)	240(26.3)	911			
At least once a week	29(80.6)	7(19.4)	36			
Daily	125(94.9)	42(5.1)	167			
<b>Watching Television</b>						
Not at all	227(39.5)	348(60.5)	575	452.224	3	0.000
Occasionally	583(64.1)	326(35.9)	909			
At least once a week	68(70.1)	29(29.9)	97			
Daily	1321(85.6)	222(14.4)	1543			

## Discussion and Conclusion

The purpose of this research was to investigate the relationships between men's HIV/AIDS knowledge with various background factors in Pakistan. About 70.6% of the study respondents have the knowledge about HIV/AIDS. Similar level of knowledge is observed in Egypt (70.5%). The main sources of knowledge were media (46.3%), internet (44.6%), school (28%), university educational courses and health education sessions (27.8%), friends (23.9%) and family (23.9%) factors in Egypt (Abd El Aty and Aziz (2019)). Men in Pakistan have higher knowledge of HIV/AIDS as compared to India 68.5% (Mehra *et al.* (2014)). The internet was identified as one of the key sources of HIV/AIDS information using the study sample of rural youth in India ((Banerjee and Keller, 2015).

**Table 2.** Logistic regression estimates of the factors associated with HIV/AIDS knowledge by males of Pakistan, PDHS 2017-18 (n = 3124)

Determinant	Independent Factors	Coefficient(S.E)	OR (95% CI)
<b>Age Groups</b>	(RC = 45-49; p-value = 0.000) 15-19	-2.276*** (0.544)	0.103(0.035-0.298)
	20-24	-0.610*** (0.216)	0.543(0.356-0.830)
	25-29	-0.197(0.176)	0.821(0.582-1.160)
	30-34	-0.189(0.170)	0.828(0.593-1.156)
	35-39	0.091(0.178)	1.095(0.773-1.551)
	40-44	-0.185(0.172)	0.831(0.593-1.165)
<b>Region</b>	(RC = Punjab; p-value = 0.000)		
	Sindh	-0.848*** (0.211)	0.428(0.283-0.648)
	KPK	-0.954*** (0.254)	0.385(0.234-0.634)
	Baluchistan	-0.357(0.258)	0.700(0.422-1.161)
	Gilgit Baltistan	-1.596*** (0.305)	0.203(0.111-0.369)
	Islamabad	-0.532** (0.266)	0.587(0.348-0.990)
<b>Type of place</b>	(RC = Urban; p-value = 0.000)		
	Rural	-0.336** (0.133)	0.714(0.551-0.926)
<b>Educational level</b>	(RC = no education; p-value = 0.000)		
	Primary	0.896*** (0.144)	2.450(1.848-3.249)
	Secondary	1.343*** (0.156)	3.829(2.823-5.194)
	Higher	2.948*** (0.302)	19.066(10.555 = 34.442)
<b>Ethnicity</b>	(RC = Urdu; p-value = 0.000)		
	Punjabi	-0.510(0.283)	0.600(0.345 - 1.046)
	Sindhi	-0.777*** (0.288)	0.460(0.261-0.809)
	Pushto	0.960*** (0.316)	2.611(1.405-4.851)
	Balochi/Brahui	-0.435(0.318)	0.647(0.347-1.206)
	Saraiki	-0.146(0.285)	0.864(0.495-1.510)
	Others	-0.155(0.301)	0.857(0.475-1.545)
<b>Sex of Household head</b>	(RC = Female; p-value = 0.000)		
	Male	0.042(0.342)	1.043(0.533-2.040)
<b>Wealth Index</b>	(RC = poorest; p-value = 0.000)		
	Middle	0.366** (0.147)	1.441(1.081-1.922)
	Richest	0.826*** (0.166)	2.285(1.649-3.166)
<b>Occupation</b>	(RC = Not Working/Households/Domestic; p-value = 0.000)		
	Professional/Technical/Managerial	0.328(0.351)	1.388(0.698-2.760)
	Clerical/Services	0.369(0.314)	1.446(0.781-2.676)
	Sales	0.063(0.304)	1.065(0.587-1.932)
	Agriculture	-0.435(0.293)	0.647(0.364-1.150)

(Continued)

Table 2. (Continued)

Determinant	Independent Factors	Coefficient(S.E)	OR (95% CI)
	Skilled manual	0.102(0.292)	1.107(0.625-1.963)
	Unskilled	-0.191(0.282)	0.826(0.475-1.436)
<b>Reading Newspaper or Magazine</b>	(RC = not at all; p-value = 0.000)		
	Occasionally	0.657***(0.142)	1.928(1.461-2.545)
	Once a week	1.078***(0.372)	2.938(1.416-6.093)
	Daily	1.296***(0.275)	3.654(2.130-6.269)
<b>Listening to Radio</b>	(RC = Not at all; p-value = 0.000)		
	Occasionally	-0.077(0.123)	0.925(0.727-1.179)
	Once a week	0.773(0.545)	2.165(0.744-6.304)
	Daily	0.264(0.241)	1.302(813-2.087)
<b>Watching Television</b>	(RC = Not at all; p-value = 0.000)		
	Occasionally	0.627***(0.141)	1.872(1.421-2.466)
	Once a week	0.855***(0.294)	2.351(1.320-4.186)
	Daily	1.150***(0.154)	3.158(2.337-4.268)
	Constant	-0.376(0.436)	0.687

\*\* P < 0.05; \*\*\*p < 0.01 S.E = Standard Error OR = Odds Ratio CI = Confidence Interval RC = Reference category.

The findings of this research are consistent with other studies conducted in Pakistan. The knowledge of HIV/AIDS at national level is revealed to be much lower when compared with other studies where sample belong to specific region. One possible reason of this profound gap in knowledge between national study sample and other studies sample is that an urban resident population with high education is selected for regions (Farid-ul-Hasnain, Johansson and Krantz (2009); Cheema (2011); Ali et al. (2018); Rehan et al. (2016); Iqbal et al. (2019)). For example 264 females studying medical sciences at the time of the survey were selected in Lahore in 2018 (Ali et al. (2018)). Therefore, a high percentage of knowledge is expected. As far as the male's knowledge of HIV/AIDS is concerned, more than 70% knowledge is observed. Only 42% of ever married women have heard of HIV/AIDS using data from 2012-13 PDHS (Abd El Aty and Aziz (2019)). The knowledge of HIV/AIDS of ever married women is found to be lower when compared with the male's knowledge (70.6%) in the present study.

The findings of the multivariate model suggest that there are variations in the level of HIV/AIDS knowledge among males in Pakistan. Place of residence, education status of the respondents, with their wealth index and mass media characteristics, including newspaper and watching television are revealed to be the main significant factors associated with HIV/AIDS knowledge in Pakistan. For example, Men between the ages of 35 and 39 from Islamabad who live in urban areas, have higher education, are of Pukhtoon ethnicity, are the head of the household, belong to the richest quintile, work in professional/technical/managerial occupations, and use media exposure factors on a daily basis would have probability of 97% of having knowledge of HIV/AIDS. Similarly, men between the ages of 15 and 19 from Gilgit Baltistan who live in the rural areas, have no-education, are of Sindhi ethnic group, belong to the poorest quintile, not using media exposure factors (Newspaper, Television) and belonging to agricultural occupation would have probability of 13% of having no knowledge about HIV/AIDS. One of the most interesting

results is that HIV/AIDS knowledge is not obtained through the radio. This result is not confined to only male respondents. The ever-married women's knowledge of HIV/AIDS using 2012-13 PDHS is explored recently in Pakistan (Iqbal *et al.* (2019)). Listening to radio is revealed to be an insignificant predictor of HIV/AIDS knowledge in females of Pakistan. However, in case of female respondents, the multivariate model predicts that the probability of having knowledge about HIV/AIDS is 92% given that she is more than 35 years of age, she belongs to KPK, an urban resident, have high education, belong to richest quintile of wealth index and have media exposure. Overall, the regression models of these two studies predict that male and female knowledge of HIV/AIDS is more than 90% by considering the significant covariates.

Interestingly, the results of the present study reveal only 3% respondents (97 cases) have knowledge of HIV/AIDS with no exposure to Television, newspaper and radio. This result draws the attention towards other sources for acquiring HIV/AIDS knowledge. Social media or the internet would be the probable ones. Social media are known to be a major source of acquiring HIV/AIDS information in some other study conducted at small scale in Pakistan (Rehan *et al.* (2016)). The exposure from social media about HIV/AIDS information could be significant in Pakistan, which is different when compared with India

The findings of this study put forward some profound implications: to educate the people as a whole about AIDS, dissemination of information about AIDS through social media, special focus on people living in rural regions and far reach areas including Gilgit Baltistan of Pakistan for AIDS awareness, focus group discussions must be designed for low socioeconomic status groups of people about the dangers of AIDS. The following implication is not based on the present study findings instead the implication is motivated through the author's observation on the patriarchal male dominated society of Pakistan. Pakistani society follows the opinions of the religious leaders rigorously. The involvement of religious leaders at the community level to share their views on AIDS could increase the awareness among people, particularly living in rural and far reach areas of Pakistan. The present study is limited to males and 2017-18 PDHS data which is three years old. It is recommended that the new wave of the PDHS may ask the role of social media in exploring the knowledge of AIDS in Pakistan as well as the special surveys be planned to explore the level of AIDS knowledge among females in Pakistan.

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**Ethical approval.** The study is based on a secondary data analysis based on data from PDHS 2017-18, a publicly available dataset. Therefore, an ethical approval is not required.

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