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Modelling Predictive Factors of Knowledge, Attitudes and Practices towards HIV/AIDS Transmission and Their Interlinked Role: A Facility-Based Cross-Sectional Study Among HIV/AIDS Patients in Lahore, Pakistan

Fatima Majeed[1], Javeria Saleem[1], Sajid Hameed[2*], Muhammad Ishaq[3], Muhammad Mohsin Aftab[1] and Ruhma Shahzad[1]

[1]Department of Public Health, Institute of Social and Cultural Studies, University of Punjab, Lahore, Pakistan
[2]Department of Public Health, Green International University, Lahore, Pakistan
[3]QA Higher Education Business School, Ulster University Partnership Program, London, United Kingdom

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***Corresponding Author:**
Sajid Hameed
Department of Public Health, Green International University, Lahore, Pakistan
doctorsajidhameed@gmail.com

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ABSTRACT

HIV/AIDS remains a significant global health challenge that disproportionately affects low and middle-income countries, including Pakistan. Understanding Knowledge, Attitudes, And Practices (KAPs) and their interlinked role in preventing HIV/AIDS was of utmost importance for effective prevention and control efforts. **Objective:** To explore the current state of KAP related to HIV/AIDS in Pakistan, emphasizing the interlinkage of these factors with each other. **Methods:** The present study was a facility-based cross-sectional study carried out with a sample size of 114 HIV patients who were enquired about their KAP using a predesigned questionnaire. The data were entered and analyzed using SPSS (version 24.0), chi-square tests, and binary logistic regression. **Results:** Approximately half of the respondents had good knowledge (43.9%) and attitudes (48.1%), while slightly more of them reported good practices (56.1%) regarding HIV/AIDS. The predictive model of KAP regarding HIV/AIDS showed that males (OR=4.25; 95%CI=1.42-12.73), females (OR=3.69; 95%CI=1.05-12.95), literate individuals (OR=2.90; 95%CI=1.35-6.25), and employed individuals (OR=2.35; 95%CI=1.08-5.13) were more likely to have sufficient levels of knowledge, with patients with good knowledge 2.54- and 3.30-fold more likely to have better attitudes (95%CI=1.19-5.44) and better practices (95%CI=1.50-7.28), respectively, and patients with better attitudes 12.59-fold more likely to have better practices (OR=12.59; 95%CI=5.06-31.29) regarding HIV/AIDS. **Conclusions:** Conclusively, the trends of KAP related to HIV/AIDS were taking a positive turn in Pakistan; however, there was still a large gap that has yet to be filled. There was a need to destigmatize the disease by disseminating the right information with concerted efforts.

INTRODUCTION

Human immunodeficiency/Acquired immunodeficiency syndrome (HIV/AIDS) is one of the most serious health challenges across the globe, with approximately thirty-eight million people. Statistics show that Sub-Saharan Africa is the most affected region by this epidemic, with more than 25 million living with the infection of HIV/AIDS [1]. A sudden upsurge in the cases of AIDS has also been observed by the National AIDS Control Program in South Asia since 2019, with an estimated 160,000 living HIV/AIDS patients in Pakistan [2, 3]. These alarming rates of HIV/AIDS in the country could be attributed to a lack of appropriate Knowledge, Attitudes, and Practices (KAP) related to HIV/AIDS. Despite the various efforts made by the government to sensitize people, HIV/AIDS KAP remains limited. Factors like cultural stigma associated with HIV/AIDS, low literacy level, and discrimination contribute to the poor understanding of HIV transmission, prevention, treatment, and care [4]. Literature indicates that specific high-risk groups, including sex workers, men who have sexual activity with men (MSM), and drug injecting users

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(IDUs) possess relatively better KAP regarding HIV/AIDS because of targeted interventions. However, the KAP related to HIV/AIDS is not widely prevalent with various misunderstandings remaining predominant [5, 6]. Studies highlight that when attitudes regarding HIV/AIDS are shaped by these prevalent myths and misconceptions, they contribute to further discrimination [6, 7]. There are certain false beliefs associated with the transmission of HIV/AIDS, including the spread of the virus through meal sharing, mosquito bites, and casual contact that aggravate societal biases and lead to various harmful practices and inappropriate treatment among the infected individuals [8]. Literature also highlights the prevalence of fear of rejection, social isolation, and adverse reactions from a society that discourages people from seeking timely diagnostic, therapeutic, and supportive care and acts as a barrier to introducing effective preventive and care interventions and achieving positive outcomes [7, 9]. The lack of sufficient knowledge, high-risk practices and negative attitudes related to HIV/AIDS contributes to the increasing number of cases of the infection [10]. One of the studies, focusing on the KAP regarding infection control measures in hospitals among health professionals reported a linear correlation between knowledge and attitudes and between knowledge and practices of health professionals; nevertheless, to the best of this knowledge, no study has focused on evaluating the interlinked role of KAP regarding HIV/AIDS specifically [11]. HIV/AIDS remains a significant global health challenge that disproportionately affects Low- and Middle-Income Countries (LMICs), including Pakistan, with a prevalence of 30.8% among IDUs, 5.2% among transgender sex workers, 1.7% among men, and 0.5% among women in a single city of Lahore. These statistics highlight that understanding KAP and its interlinked role in HIV/AIDS prevention and control is of utmost importance.

Therefore, this article explored the current state of KAP related to HIV/AIDS among HIV-infected individuals in Pakistan, emphasizing the interconnectedness of these factors, which may help in shaping the country's response to the epidemic.

METHODS

The cross-sectional study was approved by the Punjab AIDS Control Program (D.NO. PACP/Admin/26285) as well as by the Institutional Review Board (IRB), University of Punjab (D. No: 292/IIM). The paper focused on the facility-based cross-sectional part of a larger study conducted at the HIV Special Clinic of Jinnah Hospital Lahore from 8th July 2021 to 2nd January 2022. Since Lahore has a wide range of sociodemographic and economic characteristics, it was chosen for this study. As the present paper was part of an RCT, a minimum sample of 98 participants was calculated using the RCT sample formula, assuming that 60% of patients in the control arm and 85% of patients in the treatment arm (25% absolute increase) would attain a > 30% improvement in their baseline vitamin D status at 6 months with a 5% significance level, 95% confidence interval and 80% power of the study. The sample calculation formula is given below.

$$n\ (per\ arm) = \{z_{1-\alpha/2}\sqrt{\bar{p} * \bar{q}(1+\frac{1}{k}} + z_{1-\beta} * \sqrt{p_1 * q_1 + (^{p_2 * q_2}/_{k})}\}/\Delta^2$$

In total, 114 HIV-positive patients were selected through a purposive sampling technique considering HIV-positive patients ≥15 years old and obtaining antiretroviral therapy as inclusion criteria. While HIV-positive patients requiring emergency care and those who declined the consent were excluded from the study. Data were collected by a trained team using a self-administered, pretested questionnaire with both open- and close-ended questions having four sections in face-to-face settings. This questionnaire was developed using guidelines from the AIDS indicator survey model provided by the MEASURE DHS program. The first section consisted of sociodemographic information such as age, gender, education, profession, and marital status, while sections two, three, and four focused on assessing HIV-positive patients' KAP regarding disease transmission, with each section having ten questions. The final questionnaire was translated into Urdu language and was validated by three experts. All the patients were recruited from the HIV special ward in Jinnah Hospital. The data were collected in private settings to ensure the privacy and confidentiality of the respondents after communicating the purpose of the study and obtaining verbal consent from the respondents. Each question was scored as "yes" or "no", with positive KAP coded as "1" and negative coded as "0". The possible individual scores for KAP ranged from 0 to 10, with higher scores representing good KAP. Responses were dichotomous as good or poor according to a cut-off score of 5. Respondents who obtained scores >5 were considered to have good KAP, and those who obtained scores ≤5 were considered to have poor KAP regarding disease transmission among HIV-positive patients [12]. The data were analyzed using Statistical Package for Social Sciences (SPSS), version 24.0. The analysis was performed in a three-step method. Firstly, descriptive statistics were performed using frequencies and percentages for categorical variables and means and standard deviations for continuous variables. In the second step, for inferential statistics, the chi-square test was used to estimate the associations between sociodemographic characteristics and KAP regarding disease transmission among HIV-positive patients. In the last step, binary regression was applied to associations that were significant according to the chi-square test at the 95% CI to calculate the Odds Ratios (ORs) of the associated factors. In this step, the role of knowledge in predicting good attitudes and the role of knowledge and attitudes in predicting better practices

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towards disease transmission were also evaluated. Statistical significance was set at a p-value <0.05. The variables included in this study and how their associative relationships were tested were illustrated in figure 1.

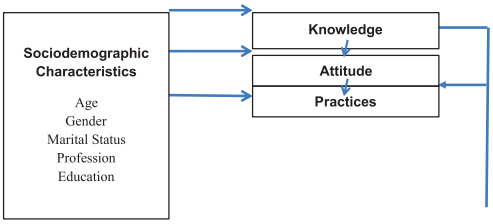

Figure 1: Variables Included in the Study

RESULTS

Out of a total of 114 HIV-positive patients, the majority of the respondents were male (56.1%), unemployed (63.2%), unmarried (71.9%) and illiterate (52.6%), with slightly more than one-third of the respondents ranging in age from 31 to 40 years (34.2%), with 33.63 ± 9.98 years as the mean age (Table 1).

Table 1: Sociodemographic Characteristics of Respondents

Variables	N (%) / (Mean ± SD)
Age	
Less than 20 Years	15 (13.2%)
21-30 Years	27 (23.7%)
31-40 Years	39 (34.2%)
41 Years and Above	33 (28.9%)
Mean	33.63 ± 9.98
Gender	
Male	64 (56.1%)
Female	25 (21.9%)
Transgender	25 (21.9%)
Profession	
Unemployed	72 (63.2%)
Employed	42 (36.8%)
Marital Status	
Unmarried	82 (71.9%)
Married	32 (28.1%)
Education	
Illiterate	60 (52.6%)
Literate	54 (47.4%)

Question-wise response for KAP related to HIV/AIDS can be seen in table 2. Overall, the majority of the patients had poor knowledge (56.1%) and poor attitudes (58.9%) towards HIV, while slightly less than half of the patients reported poor practices (43.9%) according to the operational definitions of knowledge, attitudes and practices regarding HIV (Table 2).

Table 2: Knowledge, Attitude and Practices of HIV Infected Patients

Variables	No	Yes
	N (%)	N (%)
Knowledge		
AIDS is an Incurable Disease?	51 (44.7%)	63 (55.3%)
HIV Infected Person can Share Public Toilets and Swimming Pools	93 (81.6%)	21 (18.4%)
Shaking Hand, Hugging, Food Utensil, Clothes, Comb and Towel can be Shared with HIV Patients?	74 (64.9%)	40 (35.1%)
HIV Infected Person should not Share Tooth Brush and Razor with others?	77 (67.5%)	37 (32.5%)
HIV cannot be Transmitted through Mosquito's Bites?	61 (53.5%)	53 (46.5%)
A Tattoo done with the same Device after an Infected Person cannot be used?	77 (67.5%)	37 (32.5%)
HIV can be Transmitted through Sexual Relations?	22 (19.3%)	92 (80.7%)
Sharing Injection Needle of an Infected Person can Transmit HIV-AIDS?	49 (43.0%)	65 (57.0%)
Blood Transfusion is a Major Source of HIV Transmission?	79 (69.3%)	35 (30.7%)
HIV is not a Disease of only Uneducated and Poor Persons?	37 (32.5%)	77 (67.5%)
Attitude		
AIDS cannot be Treated by Traditional Medicines	76 (66.7%)	38 (33.3%)
Infected Person can eat with others	95 (83.3%)	19 (16.7%)
Shaking Hands and Sharing Rooms with Infected People is not an Issue	18 (15.8%)	96 (84.2%)
HIV-Infected Person cannot donate Blood	84 (73.7%)	30 (26.3%)
AIDS is not a Punishment from God	35 (30.7%)	79 (69.3%)
People with AIDS must be Supported, Treated and Helped	11 (9.6%)	103 (90.4%)
HIV/AIDS affects both Rich and Poor	62 (54.4%)	52 (45.6%)
Same device cannot be used of Infected Person for Tattoo making	100 (87.7%)	14 (12.3%)
People with AIDS should not be Locked up or Isolated in a Special Center for Safety of others	22 (19.3%)	92 (80.7%)
People with AIDS should have Social Right to Study or Work	27 (23.7%)	87 (76.3%)
Practices		
Do you share Public Toilets and Swimming Pools?	18 (15.8%)	96 (84.2%)
Do you share Food Utensil, Clothes, Comb and Towel with others?	21 (18.4%)	93 (81.6%)
Do you avoid Sharing Tooth Brush and Razor with others?	84 (73.7%)	30 (26.3%)
Do you Avoid getting Tattoo Mark on your Body?	24 (21.1%)	90 (78.9%)
Do you Avoid Extra Marital Relations?	40 (35.1%)	74 (64.9%)
Do you avoid Sharing Injection Needle?	85 (74.6%)	29 (25.4%)
Do you use Condom?	25 (21.9%)	89 (78.1%)
Do you Exercise Daily?	105 (92.1%)	9 (7.9%)
Are you taking any kind of Vitamin or Mineral Supplements?	89 (78.1%)	25 (21.9%)
Do you take Medicine Regularly?	55 (48.2%)	59 (51.8%)
Level of Knowledge, Attitude and Practices		
Level of Knowledge		
Poor	64 (56.1%)	
Good	50 (43.9%)	
Level of Attitude		
Poor	58 (58.9%)	
Good	56 (49.1%)	
Level of Practices		
Poor	50 (43.9%)	
Good	64 (56.1%)	

Further analysis revealed that patients' knowledge of HIV

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was significantly associated with sex (p= 0.02), profession (p=0.02) and educational status (p<0.000), while it was not significantly associated with age (p=0.38) or marital status (p=0.52). Attitude had a highly significant association with all the sociodemographic characteristics of patients, including age (p<0.000), sex (p<0.000), marital status (p<0.000), profession (p<0.000) and educational status (p<0.000). On the other hand, practices regarding HIV were significantly associated with age (p<0.000), gender (p=0.01), profession (p=0.01) and educational status (p<0.000), while they were not significantly associated with marital status (p= 0.20)(Table 3).

Table 3: Factors Associated with Knowledge, Attitude and Practices of patients regarding HIV

Variables	Knowledge N (%)			Attitude N (%)			Practices N (%)		
Factors	**Poor**	**Good**	**p-Value**	**Poor**	**Good**	**p-Value**	**Poor**	**Good**	**p-Value**
Age									
Less than 20 Years	08 (12.5%)	07 (14.0%)	0.386	2 (3.1%)	13 26.0%)	0.000**	3 (6.0%)	12 (18.8%)	0.000*
21-30 Years	12 (18.8%)	15 30.0%)		9 (14.1%)	18 (36.0%)		8 (16.0%)	19 (29.7%)	
31-40 Years	22 (34.4%)	17 (34.0%)		24 (37.5%)	15 (30.0%)		17 (34.0%)	22 (34.4%)	
41 Years and Above	22 (34.4%)	11 (22.0%)		29 (45.3%)	4 (8.0%)		22 (44.0%)	11 (17.2%)	
Gender									
Male	31 (48.4%)	33 (66.0%)	0.024*	28 (43.8%)	36 (72.0%)	0.018*	26 (52.0%)	38 (59.4%)	0.013*
Female	13 (20.3%)	12 (24.0%)		17 (26.6%)	8 (16.0%)		7 (14.0%)	18 (28.1%)	
Transgender	20 (31.3%)	5 (10.0%)		19 (29.7%)	6 (12.0%)		17 (34.0%)	8 (12.5%)	
Employment Status									
Unemployed	46 (71.9%)	26 (52.0%)	0.023*	54 (84.4%)	18 (36.0%)	0.000**	38 (76.0%)	34 (53.1%)	0.010*
Employed	18 (28.1%)	24 (48.0%)		10 (15.6%)	32 (64.0%)		12 (24.0%)	30 (46.9%)	
Marital Status									
Unmarried	48 (75.0%)	34 (68.0%)	0.269	54 (84.4%)	28 (56.0%)	0.001*	39 (78.0%)	11 (22.0%)	0.143
Married	16 (25.0%)	16 (32.0%)		10 (15.6%)	22 (44.0%)		43 (67.2%)	21 (32.8%)	
Educational Status									
Illiterate	41 (64.1%)	19 (38.0%)	0.005**	45 (70.3%)	15 (30.0%)	0.000**	35 (70.0%)	25 (39.1%)	0.001*
Literate	23 (35.9%)	31 (62.0%)		19 (29.7%)	35 (70.0%)		15 (30.0%)	39 (60.9%)	

p-Value Calculated using Chi-square Test, *Significant at 95% Confidence Interval, ** Significant at 99% Confidence Interval

Table 4: Bivariate Logistic Regression for Factors Associated with Good levels of Knowledge, Attitudes and Practices towards HIV

Variables	Factors	Categories	OR (95% CI)	p-Value
Knowledge	Gender	Male	4.25 (1.42-12.73)	0.01*
		Female	3.69 (1.05-12.95)	0.04*
		Transgender	(1)	
	Profession	Employed	2.35 (1.08-5.13)	0.03*
		Unemployed	(1)	
	Educational Status	Literate	2.90 (1.35-6.25)	0.00**
		Illiterate	(1)	
Attitude	Knowledge	Poor	(1)	
		Good	2.54 (1.19-5.44)	0.016*
	Gender	Male	4.07 (1.43-11.54)	0.00**
		Female	4.03 (1.20-13.52)	0.02*
		Transgender	(1)	
	Profession	Employed	6.40 (2.70-15.16)	0.00**
		Unemployed	(1)	
	Marital Status	Married	4.68 (1.87-11.70)	0.00**
		Unmarried	(1)	
	Educational Status	Literate	6.57 (2.90-14.90)	0.00**
		Illiterate	(1)	
	Age	Less than 20 Years	20.31 (3.75-109.88)	0.00**
		21-30 Years	7.42 (2.35-23.37)	0.00**
		31-40 Years	2.17 (0.78-6.03)	0.13
		41 Years and Above	(1)	
Practices	Knowledge	Poor	(1)	
		Good	3.30 (1.50-7.28)	0.003**
	Attitude	Poor	(1)	
		Good	12.59 (5.06-31.29)	0.000**
	Gender	Male	3.10 (1.16-8.25)	0.02*
		Female	5.46 (1.62-18.35)	0.00**
		Transgender	(1)	
	Profession	Employed	2.79 (1.23-6.30)	0.00**
		Unemployed	(1)	
	Educational Status	Literate	3.64 (1.65-7.98)	0.00**
		Illiterate	(1)	
	Age	Less than 20 Years	8.00 (1.86-34.36)	0.00**
		21-30 Years	4.75 (1.58-14.24)	0.00**
		31-40 Years	2.58 (0.99-6.77)	0.05
		41 Years and Above	(1)	

*Significant at 95% Confidence Interval
** Significant at 99% Confidence Interval

The results of the binary regression indicate that being male, being female, being literate, and being employed predict better knowledge that further predicts better attitudes, which in turn predicts better practices regarding disease transmission among HIV-positive patients. The interlinked relationship was also illustrated in figure 2.

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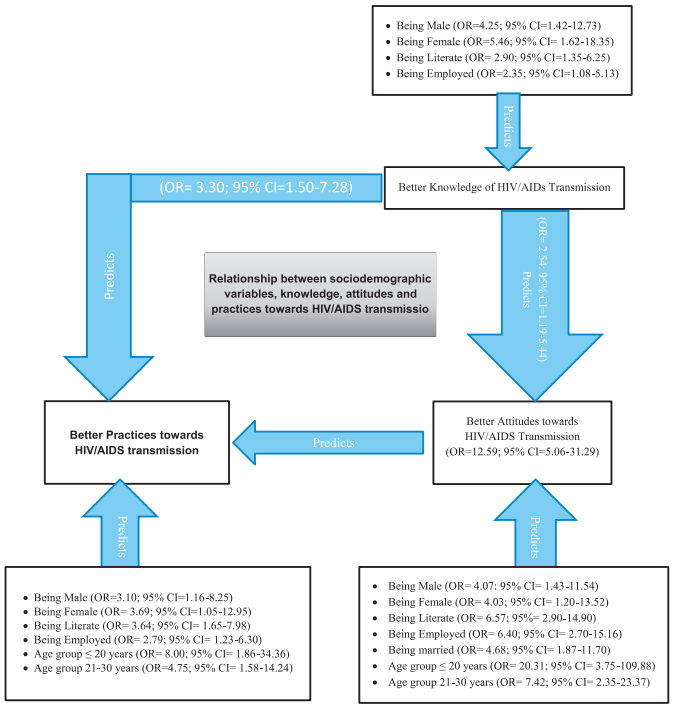

Figure 2: Relationship between Sociodemographic Variables, Knowledge, Attitudes and Practices towards HIV/AIDS Transmission

DISCUSSION

Echoing the findings of the previous studies, the present study found poor KAP among HIV/AIDS-infected individuals, with various underlying cultural myths and misconceptions regarding the transmission of the disease [13]. These misconceptions included the spread of HIV/AIDS through sharing the toilets (81.6%) and mosquito bites (53.5%), whereas, a very smaller proportion of people had appropriate knowledge and believed that HIV/AIDS-infected individuals can share meals (16.7%) and that the virus can be transmitted through blood transfusion (26.3%). Further, the present study reported males, females, employed, and literate individuals to be more likely to have good knowledge. These findings were in line with the findings of the previous study that reported a significant association between knowledge and educational status [14]. This greater likelihood of males, employed people, and literate people having good knowledge regarding HIV/AIDS could be traced to the greater exposure, opportunities, and access to different sources they have compared to transgender, unemployed and illiterate people. Another study highlights a significant association of knowledge regarding HIV/AIDS with employment status, literacy level, and age [15]. However, in the present study, age and marital status remained insignificant predictors of knowledge. The present study also highlights younger individuals (≤30 years) to have better attitudes and practices. This could be due to the higher access of younger people to information, communication, and technology from where they can get the appropriate knowledge. So, younger people could be assumed to have better knowledge regarding HIV/AIDS as reported in earlier studies, leading to better attitudes and practices, though no association was found of knowledge with age in this study [15]. The results of the present study provided insights that a good attitude is the strongest predictor of good practices regarding HIV/AIDS among infected individuals. Appropriate knowledge regarding HIV/AIDS plays a significant role in altering the attitudes and practices among individuals. However, in Pakistan, there was widespread prevalence of myths, misconceptions, and cultural stigma associated with HIV/AIDS and its transmission leading to a lack of knowledge [16] which further hinders the implementation of preventive and curative practices. In Pakistan, attitudes regarding HIV/AIDS were largely shaped by various cultural and religious influences [7, 17]. Therefore, the dire need of the time was to shift to BCCs, in collaboration with local influencers and religious scholars for molding the perception of a larger population regarding HIV/AIDS in Pakistan, which may not only help in spreading the right kind of information but also aid in destigmatizing the disease. The results of this study could serve as a foundation for targeted public health interventions and shape a response to the HIV/AIDS epidemic in the country. However, the present study has been conducted in a single district on a small sample. Future studies, in different geographical areas on more diverse populations with larger samples can be conducted to provide better insights on the KAP [18-20].

CONCLUSIONS

The present study concluded that the trends in KAP related to HIV/AIDS were taking a positive turn in Pakistan; however, there was still a large gap that has yet to be filled, as more than half of the people have insufficient knowledge, follow poor practices and have negative attitudes. There was a need to destigmatize the disease by disseminating the right kind of knowledge regarding the spreading mode of HIV/AIDS other than sexual transmission on public platforms. Concerted efforts were needed to address the interconnectedness of KAP regarding HIV/AIDS for effective prevention and control.

Authors Contribution

Conceptualization: FM, JS
Methodology: JS, MI, MMA
Formal analysis: JS, SH
Writing, review and editing: FM, SH, RS

All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

All the authors declare no conflict of interest.

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