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ORIGINAL ARTICLE

PUBLIC KNOWLEDGE AND ATTITUDE TOWARD HIV: A COMMUNITY-BASED CROSS-SECTIONAL STUDY IN TWIN CITIES, PAKISTAN

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ABSTRACT

Background: The knowledge and attitude about HIV/AIDS are crucial to foster an accepting and informed community for a positive shift in attitude towards an increasingly prevalent communicable disease. The study assessed the relationship between knowledge of HIV and attitudes towards People Living With HIV/AIDS (PLWHA)

Materials & Methods: This cross-sectional study was conducted for one year from February 1st, 2022, to 31 January 2023. A two-stage stratified cluster sampling method was used to collect data from 410 ever-married women and men aged 18 and above from the households in the urban area of Rawalpindi and Islamabad. Data were entered and analysed using SPSS version 27 and the Pearson chi-square test checked the association between the baseline characteristics and the discriminatory attitude towards People Living with HIV and AIDS (PLWHA). Binary logistic regression examined the statistical significance of associations between comprehensive knowledge of HIV and AIDS and the potential predictors. Ordinal logistic regression analysed knowledge and attitude to provide insights into how changes in knowledge level influence attitudes towards PLWHA at 5% level of significance.

Results: The mean age of responders was 34.4 ±12.1 years, with more than 28% of participants being in the less than 34 years age group. The results showed a significant gender difference in knowledge levels with a notable gender disparity in knowledge levels, with males being significantly less knowledgeable by 84% as compared to females, to have comprehensively knowledgeable [OR=0.161, 95% CI (0.071 to 0.367), P<0.001]. Out of 290 male respondents, 208 (71.7%) had a positive and inclusive attitude towards PLWHA, but it was even higher in female respondents (90%). The association between gender and attitude was statistically significant [chi-square (χ^2) = 19.29, p <0.001]. For each unit increase in knowledge, the odds of being in a higher non-discriminatory attitude category increased by 85% [OR=0.152, 95% CI 0.091 to 0.253, p <0.001].

Conclusion: The findings from this study indicate that as knowledge increases, individuals become more likely to have a positive behaviour towards people living with HIV and AIDS.

KEY WORDS: Attitude; HIV; Knowledge; Social determinants of health; Sociodemographic inequities; Stigma.

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INTRODUCTION

Human Immunodeficiency Virus (HIV) has become a significant public health issue across the world, challenging developing countries.[1] The last decade was a hub of several HIV outbreaks in our country and a rise in new HIV infections, with a surge in provinces of. More than 6000 cases were reported, followed by 2096 new cases in 2022, the same year the capital territory had documented more than 500 cases.[2-4]

The 2022 report by the Joint United Nations Programme on HIV/AIDS (UNAIDS) highlighted that

almost 39.0 million people are infected with HIV. Alarmingly, 37.5 million out of the 39 million are 15 years and above, with nearly a third of new HIV infections among the age group of 15-24-year-olds.[5,6] The HIV prevalence predominantly affects the marginalised and key populations; however, recently, it is not just the middle-aged and above that have experienced a significant burden of disease, but also adolescents.[2,4,7] In the horrific outbreak of 2019, the women and children were exposed to HIV in the capital of Ratodero Taluka, a sub-division of the District in the province. This outbreak highlights that HIV now threatens the public by having the potential to spread in the general population.[2,4,7] HIV/AIDS, worsened by youth drug use and unsafe medical practices, endangers vulnerable groups and demands urgent prevention. Stigma and discrimination heighten mental health and NCD risks for PLWHA.

Understanding the public's knowledge of HIV/AIDS and attitudes towards those living with the disease is essential for effective prevention and support strategies. Our study aimed to evaluate current knowledge levels and attitudes to identify influencing factors towards people living with HIV and AIDS (PLWHA). The objectives of our study were:

- To assess public knowledge regarding HIV/AIDS and the association of socioeconomic and demographic variables with knowledge & attitudes towards People Living with HIV and AIDS (PLWHA) amongst the residents of Rawalpindi and Islamabad.
- To analyse the relationship between knowledge and attitude towards People Living with HIV/AIDS (PLWHA) in households of twin cities.

MATERIALS AND METHODS

This cross-sectional analytical study was conducted for one year from February 1st, 2022, to 31 January 2023 after obtaining Ethical approval from Institutional Review Board of vide letter #06/ORIC/2021-08. It includes data from ever-married women and men aged 18 and above who are aware about the communicable disease, HIV/AIDS.

Two-stage stratified cluster sampling method was used to have a representative and reliable sample of the population. At the first stage the enumeration blocks from society were randomly included by computer generated numbers as the primary sampling units. Then in the second stage random selection of streets was done and then households were selected using a systematic sampling technique with a random start (every odd number house). Similarly, in Society out of the five phases (4,5,6,7 & 8), three were randomly selected via computer generated numbers and in the second stage random selection of streets was done and households were selected using a systematic sampling technique from a listed household on the selected streets.

The inclusion criteria were ever married, male and female, residents of and during, 18 years and above, and willing to be part of the study after informed verbal and written consent.

On the other hand, individuals who were younger than 18 years, never been married, haven't heard about HIV/AIDS or had a mental disorder, non-residents of and society, and not agreeing to verbal as well as written consent were excluded from the study.

The required sample size for this study has been estimated by using the single population proportion formula by considering the assumptions critical value for normal distribution at a 95% confidence level, estimated proportion (50%), and absolute precision or margin of error 5%, sample size was calculated to be 385. It was inflated to 15% by accounting for non-respondents and incomplete questionnaires so the total sample size of 410 was retained.

The questionnaire was developed through an extensive literature review on HIV/AIDS knowledge and attitudes for community-based studies in low- and middle-income countries.[8, 9,10, 11 11-13] Questions were selected from various validated instruments, National AIDS Control Program website guidelines, peer-reviewed literature, and studies, then adapted to fit the specific context of this research.[11-12] Modifications were made to ensure relevance and clarity, and the questionnaire was subsequently reviewed for consistency and coherence across all items. The questionnaire was translated to Urdu from English and translated back to English to observe its consistency by two experts in Urdu and English. The face validity of the questionnaire was assessed by public health experts, a clinician, a general physician, and a non-medical person. Cronbach's alpha coefficient was used to determine the internal consistency of the questionnaire test-retest reliability, using an intraclass correlation coefficient (ICC) measurement. The experts reviewed and checked the data for completeness, accuracy, and consistency. Pilot questionnaire testing was done on 20 participants and changes were made after pre-testing to make the questionnaires more acceptable according to participants understanding level.

The data were stored, and managed in SPSS version 27, after, cleaning, editing, and coding data were analysed using SPSS 27. Any errors were repaired as necessary.

The questionnaires consisted of three main sections with sociodemographic characteristics, ten knowledge questions (two-scale answer choices, yes/no), and eight attitude questions (five-point Likert scale) related to HIV/AIDS. The correct and incorrect answers for knowledge were coded as 0 and 1 and later categorized as limited knowledge (LK, scoring a total of 1-8 points) and comprehensive knowledge (CK, scoring 9-10 points). Attitude towards people living with HIV/AIDS was measured on a 5-point Likert scale with the options of strongly disagree,

disagree, neither agree nor disagree, agree, and strongly agree. The results regarding attitudes towards PLWHA indicated that participants scoring below the mean demonstrated a discriminatory attitude towards HIV/AIDS coded as 1, those scoring at the mean exhibited a moderate level (somewhat discriminatory), while scoring above the mean were categorized as having favourable (non-discriminatory) attitudes, respectively.

Descriptive statistics were initially done, and the association test was carried out using the Pearson chi-square test between baseline characteristics and the discriminatory attitude towards PLWHA of the respondents. The binary outcome variable was limited knowledge (LK) and comprehensive knowledge (CK). Binary logistic regression was used to examine the statistical significance of associations between CK for HIV and AIDS and the potential predictors. Ordinal logistic regression was used to assess the relationship between knowledge and attitude to provide insights into how changes in knowledge level might influence or predict attitudes (outcome variable) towards PLWHA at a 5% level of significance.

RESULTS

A total of 410 participants participated with a 100% response rate. The mean age of responders was 34.4 ±12.1 years, with more than 28% of participants being in less than 34 years age group. Seventy one percent (290) of the participants were males. All participants were once married with almost 90 % in the married category and the and 9% in the divorced and separated category combined. About 134 (32.7%) of the participants were government employees and majority 264 (64.4%) were private or self-employed. More than half of the respondents had academic/higher education (220, 53.7%), and 111 (27.1%) of participants had completed secondary higher education. The income of 36.6% was above 75,000 Rupees (PKR)-Table 1.

The 2 main outcome variables of the study are knowledge of the respondents about HIV & AIDS and the attitude towards People Living with HIV & AIDS. To assess the predictors of Knowledge about HIV and AIDS, Binary Logistic Regression was used, which showed that the logistic regression model provides insights into how demographic and socioeconomic factors (age, gender, marital status, educational level, occupation or source of income, income dichotomized as less, and more than 75000 PKR influence the likelihood of having comprehensive knowledge (CK) versus limited knowledge (LK). Results show that older participants are less likely to have CK compared to younger participants [OR=0.97, 95% CI (0.960 to 0.999), $p = 0.043$] and for every one-unit increase in age, the odds of CK versus LK decrease by 0.021 units. The results showed a significant gender difference in knowledge levels with a notable gender disparity in knowledge levels, with males being significantly less knowledgeable by 84% as compared to females to have comprehensively knowledgeable [OR=0.161, 95% CI (0.071 to 0.367), P<0.001], Table II. Each marital status category (married, separated, divorced and widowed) has its own coefficient and odds ratio relative to the reference category (married). These coefficients indicate how marital status influences the odds of having CK versus LK. The estimate under all the categories of marital status has a positive effect on the outcome variable, but this effect is not statistically significant at the 0.05 level. The negative coefficient for Income (-1.663) suggests that lower income is associated with LK. Participants in the Lower income category that is earning less than 75000 PKR have 81% lower odds of having CK compared to those in the Higher income category [OR=0.189, 95% CI (0.099 to 0.362), p < 0.001]. This variable is statistically significant (p < 0.001), suggesting that income influences knowledge levels. Table-2.

Table 1: Socio-Demographic Descriptive Characteristics of Participants

Variables	Frequency (n)	%age
Age Mean and SD= 34.4 ±12.1 with a range of 18-80 years old		
≤34	263	64
≥35	147	36
Gender		
Male	290	71
female	120	29
Marital Status		
Married	367	89.5
Separated	20	4.9
Divorced	17	4.1
Widowed	6	1.5
Educational Level		
Primary	23	5.6
Secondary	111	27.1
Higher secondary	56	13.7
Academic education	220	53.7
Occupation		
Govt employees	134	32.7
Private Employees	264	64.4
Others (housewives, Jobless, Retires)	12	2.9
Income PKR		
≤75,000	260	63.4
≥75,001	150	36.6

Table 2: Predictors of Knowledge about HIV and AIDS in Study Participants-Binary Logistic Regression

Variables	Limited Knowledge n (%)	Comprehensive Knowledge n (%)	OR	P Value	95% CI for OR	
					Lower	Upper
Age						
≤34 years	93 (35.4%)	170 (64.6%)	1*			
≥35 years	59 (40.1%)	88 (59.9%)	0.979	0.043**	0.960	0.999
Gender						
Male	144 (49.7%)	146 (50.3%)	0.161	0.001	0.071	0.367
Female	8 (6.7%)	112 (93.3%)	1*			
Marital Status						
Married	133 (36.2%)	234 (63.8%)	1*	0.606		
Separated	9 (45%)	11 (55%)	1.954	0.570	0.194	19.682
Divorced	7 (41.2%)	10 (58.8%)	1.647	0.703	0.127	21.327
Widowed	3 (50%)	3 (50%)	3.894	0.296	0 .305	49.757
Educational Level						
Primary	12 (52.2%)	11 (47.8%)	1*	.001**		
Secondary	71 (64%)	40 (36%)	0.579	0.271	0.219	1.533
Higher Secondary	14 (25%)	42 (75%)	0.245	0.000**	0.137	0.439
Academic	55 (25%)	165 (75%)	1.461	0.324	0.687	3.106
Occupation						
Government	46 (34.3%)	88 (65.7%)	1*	0.164		
Private/self employed	103 (39%)	161 (61%)	0.745	0.737	0.134	4.135
Other (retired unemployed)	3 (25%)	9 (75%)	0.462	0.371	0.085	2.506
Income						
≤ 75000	136 (52.3%)	124 (47.7%)	0.189	0.001**	0.099	0.362
≥ 75000	16 (10.7%)	134 (89.3%)	1*	0.006**		

*Reference category, **Statistically significant at 5%, CI: Confidence interval, OR: Odds ratio,

Out of 290 male respondents 208 (71.7%) had positive and inclusive attitude towards PLWHA, but it was even higher in female respondents (90%). The association between gender and the attitude was statistically significant [chi-square (χ^2) = 19.29, p <0.001]. The level of education was significantly associated with the attitude towards People Living with HIV & AIDS [χ^2 =151.81, P<0.001]. A higher level of education was associated with a more positive attitude as 95.5% respondents having academic education had positive attitude as compared to the level of education up to primary level having only 43.5% appearing in positive nondiscriminatory attitude. Participants, privately or self-employed had the most positive attitude (64.4%), however, the association was not statistically significant. Table -3.

The Association of Knowledge with Attitudes towards PLWHA was analysed using an Ordinal Logistic Regression Analysis with independent variable as scale from 0-10 scores (zero being the lowest and ten as highest knowledge). The outcome variable, attitude (in three ordered categories, discriminatory, somewhat discriminatory and not discriminatory at all) depending on the predictor variable i.e., knowledge about HIV/AIDS towards PLWHA.

The results indicate that as the underlying latent predictor such as knowledge increases, individuals become more likely to transition to the next category, reflecting a stronger influence/effect of the latent variable on their behaviour or responses. The odds ratio (0.152) indicates that with every increase in knowledge increases the odds of being in a higher attitude category by 85% [OR=0.152, 95% CI 0.091 to 0.253, p <0.001].

Table 3: Percentage Distribution of Baseline Characteristics within the Three Categories of Attitude Towards PLWHA-Bivariate Analysis

Variables	Attitude towards People Living with HIV and AIDS (PLWHA)				
	Discriminatory n (%)	**Somewhat Discriminatory n (%)**	**Non-Discriminatory (positive) n (%)**	**Total n %)**	**Chi-Square (χ^2) and *p* value**
Gender					
Male	12 (4.1%)	70 (24.1%)	208(71.7%)	290 (70.7%)	19.292
Female	4 (3.3%)	7 (5.8%)	109 (90.8%)	120 (29.3%)	P<0.001
Age in category					
≤34	6 (2.3%)	51(19.4%)	206 (78.3%)	263 (64.1%)	5.182
≥35	10 (6.8%)	26 (17.7%)	111 (75.5%)	147 (35.9%)	*p*=0.075
Marital Status					
Married	10 (2.7%)	70 (19.1%)	287 (78.2%)	367 (89.5%)	29.56
Separated	1 (5.0%)	0 (0.0%)	19 (95.0%)	20 (4.9%)	*p*<0.001
Divorced	4 (23.5%)	5 (29.4%)	8 (47.1%)	17 (4.1%)	
Widowed	1(16.7%)	2 (33.3%)	3 (50.0%)	6 (1.5%)	
Educational Level					
Primary	3 (13.0%)	10(43.5%)	10(43.5%)	23 (5.6%)	151.81
Secondary	13 (11.7%)	53 (47.7%)	45 (40.5%)	111 (27.1%)	P<0.001
Higher secondary	0 (0.0%)	4 (7.1%)	52 (92.9%)	56 (13.7%)	
Academic Education	0(0.0%)	10 (4.6%)	210 (95.5%)	220 (53.7%)	
Occupation					
Govt employees	7 (5.2%)	24 (17.9%)	103 (76.9%)	134 (32.0%)	2.64
Private Employees	8 (3.0%)	52 (19.7%)	204 (77.3%)	264 (64.4%)	P=0.619
Other (Jobless, Retired)	1 (8.3%)	1(8.3%)	10 (83.3%)	12 (2.9%)	
Income					
≤75,000 PKR	13 (5.0%)	66 (25.4%)	181 (69.6%)	260 (63.4%)	24.15
≥75,001	3 (2 %)	11 (7.3%)	136 (90.7%)	150 (36.6%)	P<0.001

DISCUSSION

The study explored the knowledge gaps that exist between social determinants and their impact on the awareness and understanding of the disease. The findings will help to understand how factors such as socioeconomic status and knowledge influence the spread and management of the disease and sensitize people about the disease, fostering greater awareness and promoting more informed public health interventions. A positive and inclusive (non-discriminatory) attitude towards people living with HIV is crucial, as it fosters acceptance and encourages openness about the disease.[12] A more accepting and informed community can lead to greater sensitivity and understanding, ultimately increasing knowledge about HIV. This positive shift in attitude can also promote more frequent testing and better prevention efforts.

Recent studies reveal that public knowledge and attitudes towards People Living with HIV/AIDS (PLWHA) are significantly influenced by socioeconomic and demographic factors across different global regions, with education consistently linked to reduced stigma.[13]Results from our study are aligned with the findings from previous studies across the globe, as higher education levels are strongly associated with lower stigma and better knowledge about HIV/AIDS.[12,14] Studies from regions such as sub-Saharan Africa, Italy, and Indonesia highlight similar determinants that affect stigma levels. For instance, lower education and media access increase the likelihood of discriminatory attitudes.[13, 15 16, 17]

The study by et al. conducted in Albay, Philippines, evaluates knowledge, attitudes, and practices towards HIV/AIDS and examines demographic influences, like age, sex, and income, on these factors within a vulnerable population.[14]

Income and access to information play critical roles in shaping public attitudes, as our study shows. The higher income group had the least discriminatory attitude towards PLWHA.[13,18] In our study, younger age groups (under 35 years) exhibited a more positive and non-discriminatory attitude than older age groups. This finding is consistent with a survey by Achamyeleh Birhanu Teshale et al. in Sub-Saharan African nations.[15] A study conducted by Gedefaw Diress et al. in Ethiopia among the public found that 93.8% of men and 64.5% of women held discriminatory attitudes toward people living with HIV/AIDS (PLWHA).[19] In contrast, our study reported significantly lower figures, with 28.2% of men and 9.1% of women displaying such attitudes. Gedefaw et al. also identified key factors that increased the likelihood of discriminatory attitudes, including rural residence, lack of formal education, limited media access, no prior HIV testing, and insufficient comprehensive knowledge about HIV.[19] Information, education, and communication programmes need to intensify their educational campaigns to dispel these misconceptions.

Overall, the literature indicates that targeted educational strategies addressing socioeconomic disparities could effectively reduce stigma and improve public perceptions of people living with HIV/AIDS on a global scale. Extensive discriminatory attitudes in a population can affect people's willingness to be tested for Human Immunodeficiency Virus (HIV), their initiation of antiretroviral therapy, social support as well as the quality of life of people infected with HIV. Effective educational programs that target specific misconceptions and cultural contexts are essential for reducing stigma and improving knowledge. [12]

Multiple factors contribute to the HIV outbreaks, including inadequate and fragmented healthcare services, poor infection control, questionable ethical practices, inadequate screening, lack of awareness and knowledge about the disease, as well as social stigma attached to HIV/AIDS, political instability, rise in inflation, and poverty. To control the spread of HIV, the governmental policies must take action for effective implementation.[20,21] Awareness campaigns targeting high-risk populations, such as injecting drug users and sex workers, are prioritized but keeping in view the 2019 outbreak of Rotodero where the vulnerable groups such as children and women were exposed to the virus require awareness campaigns focusing on accurate information to enhance knowledge about HIV transmission and prevention and to promote inclusive non-discriminatory attitude towards individuals living with HIV in general populations.[22]

The limitations of a cross-sectional study conducted in two neighbouring cities are its inability to establish causal relationships and its only capture data at a single point in time. Due to geographic and demographic differences, the findings may not be generalizable to other regions or populations. Additionally, unmeasured confounders and selection bias may affect the validity of the results.

CONCLUSION

The study concludes that as people become more informed and educated about HIV and AIDS, their attitudes are likely to become more accepting and less biased or discriminatory towards those who are affected.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
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AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

Conception or Design:	HS, SM
Acquisition, Analysis or Interpretation of Data:	HS, SM, YT, NJ, SN, AA, SA
Manuscript Writing & Approval:	HS, SM, YT, NJ, SN, AA, MD, UH

All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.