

Knowledge about HIV/AIDS among women in Bangladesh: an urban-rural comparison of trend, attitude and determinants

Abstract

Objective: This study is aimed to observe the knowledge trend regarding HIV/AIDS and to identify the associated factors of the HIV/AIDS knowledge among the urban and rural Bangladeshi women.

Methods: The data were extracted from the Bangladesh Demographic and Health Survey (BDHS) in 2004 and 2014, collected from women aged 15-49 years from seven administrative divisions of Bangladesh. To analyse the data, Chi-square test (χ^2) and multivariate logistic regression analysis was utilized.

Results: In Bangladesh, the prevalence of the women's HIV/AIDS knowledge in urban area was 83.1% whereas in rural area was 63.9% in 2014. The results revealed that reading newspaper/radio (urban: aOR=4.979, CI: 2.242-11.056 and rural: aOR=1.993, CI: 1.372-2.889), watching TV (urban: aOR=2.129, CI: 1.404-3.228 and rural: aOR=2.345, CI: 1.904-2.889), NGO health workers visit (urban: aOR=1.592, CI: 1.391 and rural: aOR=1.391, CI: 1.097-1.765), women's decision-making power about health care (urban: aOR=1.486, CI: 1.055-2.093 and rural: aOR=1.393, CI: 1.161-1.672) are significantly associated with having HIV knowledge as well as respondent's education, economic and marital status for both urban and rural area. Alongside with these factors, husband's education, age at marriage, condom use during intercourse, community clinic awareness, govt. health worker visits and victimization of IPV are also vital predictor of having HIV knowledge in rural Bangladesh.

Conclusion: In Bangladesh, it is essential to improve the educational program regarding HIV/AIDS especially for rural women. Mass media can play important roles in rising awareness about HIV/AIDS in both urban and rural areas. The Bangladesh Government and NGOs should increase the household visit by their health assistant and workers in this regard.

Keywords: HIV/AIDS, knowledge, determinants, logistic regression models

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Abbreviations: HIV: human immunodeficiency virus; AIDS: acquired immune deficiency syndrome

Introduction

The infection of human immunodeficiency virus (HIV) is responsible for an incurable infectious disease named "Acquired immune deficiency syndrome (AIDS)", one of the biggest global health challenges in recent years. After identifying the first case of this chronic life-threatening ailment in the USA in 1981, the HIV/AIDS infection has permeated quickly to many countries.¹ According to World Health Organization, 36.9 million people were living with HIV in 2017, especially, women are in greater risk constituting 51% of all adults living with HIV, increasing at a rate of 7000 young women become infected per week.^{2,3} Besides, South-East Asian countries contain 2nd highest amount of HIV infections, 3.5 million people, right after the Africa.³ The first case of HIV/AIDS was reported in

Bangladesh in 1989. In 2011, the number of HIV-positive people was 2,533 but the amount has dramatically increased in last six years and stand at around 13000 infected people with around 1700 new cases in 2017.^{3,4} and 34% of which are females aged 15 and over.² HIV/AIDS can transmit person to person through sexual contact with an infected person and through infected blood transmission.⁵

Though Bangladesh is not in such an alarming state of HIV epidemic, the country has greater risk because of several factors: the geographical immensity with India and Myanmar, top two severely HIV infected countries in this region,^{6,7} gender disparity and poverty, drug trafficking and abuse, poor health-seeking behaviour and specifically, poor knowledge and awareness about HIV/AIDS.^{7,8} In 2018, nearly a million of Rohingya have eluded to Bangladesh after experiencing genocide in their native land Myanmar and a good amount of them were HIV positive which increases the risk at high level.⁹ The infection proportions inside the susceptible clusters are

growing, foremost, to an almost half likelihood that the worm will feast on the overall people.¹⁰⁻¹² The circumstances have elevated thoughtful anxieties among management, government and policy makers and they are looking forward to the community knowledge and awareness on the transmission and deterrence of HIV.¹³

Worldwide, a wide range of researches have been conducted regarding the epidemiology, etiology and community knowledge and awareness of HIV/AIDS. Females from the growing age (<25 years) are the most vulnerable to HIV knowledge.^{8,14} Couple's education is also vital influencing factor to have good HIV knowledge.^{15,16} Besides, prior studies have demonstrated that level of HIV knowledge tends to be higher in societies where people enjoy greater degree in freedom of communication, seek health advocacy, and engage in peer communication.¹⁶

Bangladeshi women's HIV/AIDS knowledge level are very poor and have a higher risk of HIV infection.⁸ Sometimes, a teenager was misused by the sexual ferocity and abuse, initial sexual beginning and they do not have the ability to negotiate for safe sex, and also other factors such as the absence of education.¹⁷ Again, women living in rural areas are less likely to have extensive knowledge about HIV compared to urban women.^{8,18,19} Existing literature regarding urban and rural inequalities as they appertain to HIV/AIDS knowledge in Bangladesh is very limited. Therefore, comparing the rural-urban trend, this study is aimed to notice the attitudes towards HIV/AIDS among women and to identify the associated factors with the knowledge and awareness about HIV/AIDS among the urban and rural Bangladeshi women.

Data and Methodology

Study setting and sampling procedure

To conduct this study, two waves of national representative cross-sectional data were extracted from Bangladesh Demographic and Health Survey (BDHS) conducted in 2004 and 2014. These two surveys were conducted in the seven administrative divisions of Bangladesh: Dhaka, Chittagong, Rajshahi, Khulna, Sylhet, Rangpur, and Barisal. The District (zilas) is the part of one division and are divided into further administrative unit called "Upazilas", consisting of urban (wards and city corporation unit) and rural areas (Union parishad and villages). A sampling frame for the list of enumeration areas (EAs) in these surveys were utilized based on the national population and housing census in 2001 and 2011 by Bangladesh Bureau of Statistics (BBS).^{20,21} In these surveys, the household was selected based on a two-stage stratified technique. In the 1st stage, a total of 361 for BDHS-2004 and 600 for BDHS-2014 of enumeration areas consisting of urban (122 in BDHS-2004 and 207 in BDHS-2014) and rural areas (239 in BDHS-2004 and 393 in BDHS-2014) were selected with the probability proportional size. In the 2nd stage, households were independently selected from the urban and rural areas from the 7 divisions using the systematic sampling, based on demographic and health variables. The study design has selected 10,811 and 18,000 residential households for the survey in 2004 and 2014, respectively.^{20, 21} The overall response rate was 99%. Total sample size of these surveys were 11440 in 2004 and 17863 in 2014. All information was collected from women at reproductive age (15-49 years). In this study analysis, we utilized total sample size of

these surveys in particular year due to there was no missing values in outcome variable.

Response and explanatory variables

To fulfil the study objective, respondent's knowledge about HIV/AIDS was selected as response or dependent variable gathered by asking question, "Have Knowledge about HIV/AIDS", is addressed

as follows, $Y = \text{Have Knowledge about HIV} = \begin{cases} 1, \text{Yes} \\ 0, \text{No} \end{cases}$; Further the respondents were asked few more questions to observe their level of knowledge and notion about HIV.

On the other hand, various socio-demographic variables were used as explanatory variables to identify the influencing factors of the knowledge about HIV/AIDS in urban-rural differential context. These variables were selected in accordance with their importance based on previous studies. Explanatory variable includes: respondents' age, education, husband's education, economic status, geographical variance, marital status, age at marriage, number of children, current contraceptive use, reading newspaper/radio, watching television, visited community clinic, visited by government health workers, visited by NGO workers, victim of intimate partner violence and decision-making power about health care.

Statistics analysis

The data was analysed using Statistical Program for Social Sciences (SPSS) in windows version 25. To calculate relative change in HIV/AIDS knowledge from 2004 to 2014, the following formula was used: $\frac{P_{2014} - P_{2004}}{P_{2004}} \times 100$. To assess the association with knowledge about HIV/AIDS and some explanatory variables, the chi-square (χ^2) test was conducted (set up for significant at $p < 0.05$). The associations between the knowledge about HIV/AIDS and the possible influencing factors were examined with logistic regression models. As the outcome variable was dichotomized in binary form, the binary logistic regression analysis was used to identify the risk factors. The odds ratios were estimated and to measure the level of significance, 95% Confidence Interval (CI) was also estimated at $p < 0.05$ of significance level.

Results

In Bangladesh, the prevalence of the women's HIV/AIDS knowledge in urban area was 83.1% in 2014 with a rate of 1.71% increase whereas in rural area had 63.9% in 2014 with a rate of 18.9% increase over the period 2004-2014. Table 1 represents the relative change in HIV/AIDS knowledge in both urban and rural area according to various socio-demographic and economic characteristics over the period 2004 to 2014. The highest increase of HIV knowledge observed in age group 35-49 years (urban: 14.8% and rural: 50.9%), and among urban and rural poorest women, 13.8% and 54.9%, respectively. Muslim and employed rural women had 21.7% and 29.5% increase in HIV knowledge over last 10 years, respectively. The highest increase of HIV knowledge was found in rural area of Sylhet division (39.8%).

Table 1: Relative change in knowledge about HIV/AIDS according to socio-demographic and economic characteristics over the period 2004-2014 in Bangladesh

Background Characteristics	Urban			Rural		
	2004 (%)	2014 (%)	Change (%)	2004 (%)	2014 (%)	Change (%)
Overall HIV Knowledge	81.7	83.1	1.71	53.7	63.9	18.9
Age (in years)						
15-24	86.1	83.9	-2.6	65.6	64.0	-2.4
25-34	84.1	82.6	-1.8	52.0	63.7	22.5
35-49	74.9	86.0	14.8	42.4	64.0	50.9
Education						
No education	62.3	59.1	-5.3	30.5	33.8	10.8
Primary ¹	80.3	75.8	-5.6	57.8	58.3	0.9
Secondary and above ¹	97.2	94.5	-4.2	85.7	86.4	0.5
Economic status²						
Poorest	43.6	49.6	13.8	27.3	42.3	54.9
Poor	60.3	66.4	10.1	41.9	55.2	31.7
Middle class	69.9	75.4	7.9	56.2	70.7	25.8
Rich	82.0	83.9	2.3	73.0	80.2	9.9
Richest	95.0	93.9	-1.1	86.7	91.3	5.3
Religion						
Muslim	81.5	83.3	2.2	53.0	64.5	21.7
Non-Muslim	82.7	81.0	-2.1	59.4	57.5	-3.2
Employment status						
Unemployed	84.0	84.3	0.4	54.8	63.8	16.4
Employed	74.6	83.8	12.3	49.5	64.1	29.5
Division						
Barisal	80.6	87.2	8.2	59.2	66.8	12.8
Chittagong	76.7	80.5	4.9	54.0	66.1	22.4
Dhaka	87.1	88.5	1.6	56.1	69.3	23.5
Khulna	90.3	87.8	-2.8	67.3	74.3	10.4
Rajshahi	72.8	82.1	12.8	46.3	58.5	26.4
Sylhet	80.5	74.5	-7.5	40.0	55.9	39.8

Note: ¹Primary and secondary education is defined as completing grade 5 and 10, respectively

²Followed BDHS wealth index standard measure

People's attitude towards HIV

Urban-rural knowledge differentials of HIV/AIDS are represented in Table 2. The study found, 63.6% and 75.4% of urban women, and 56.6% and 70.3% of rural women answered condom use during sexual intercourse and intercourse with only one partner rather than multiple can reduce the risk of AIDS, respectively. Surprisingly, 37.1% of rural women even 27.1% of urban women still believed that HIV can spread from mosquito bites and many other prejudices like HIV

can spread by sharing food with an infected person (rural: 42.8% and urban: 31.2%) or it's a witchcraft. On the other hand, women had good knowledge that unsafe blood transmission and unsterilized syringe use (90.3% and 90.7% of urban women and 86.5% and 89.0% of rural women, respectively) increases the infection risk highly. Besides, 62.5% of rural women and 62.7% of urban women assumed that HIV can transmit during delivery and 78.3% of rural women and 79.7% of urban women deemed that HIV can transmit by breastfeeding.

Table 2: Urban-rural knowledge differentials about HIV/AIDS in Bangladesh in 2014

Knowledge items	Year 2014	
	Urban (%)	Rural (%)
To reduce the risk of HIV		
Use condom during sex	63.6	56.6
Have one sex partner only	75.4	70.3
Prejudice		
Spread through mosquito bites	27.1	37.1
Spread by sharing food with infected person	31.2	42.7
Can be infected by witchcraft	8.6	11.6
HIV can get through		
Using unsterilized needle or syringe	90.7	89.0
Unsafe blood transmission	90.3	86.5
HIV can transmit		
During pregnancy	80.7	79.7
During delivery	62.7	62.5
By breastfeeding	79.7	78.3

Associated risk factors

Table 3 represents the association between HIV/AIDS knowledge and various explanatory variables in the urban and rural Bangladesh (BDHS 2014) were assessed by the χ^2 -test. Respondent’s age (35-49 years: 86%) was significantly associated with HIV/AIDS knowledge in the urban area but not in the rural area. Showing a highly significant association, secondary or above educated Bangladeshi women had highest HIV knowledge in both urban and rural area (94.5% and 76.2% respectively) but illiterate rural women had a very poor knowledge (only 33.8%). The study result showed that the HIV knowledge was significantly higher among rich (urban: 83.9% and rural: 80.2%)

and richest (urban: 93.9% and rural: 91.3%) family. The HIV/AIDS knowledge was significantly higher among married women, whose age at marriage was more than 16 year in both areas and use condom as contraceptive method. Media exposer like reading newspaper/ radio, watching television was also a good associated factor. Among the Bangladeshi rural women, community clinic visit (66.9%) and visited by government health workers (75.2%) are playing positive role on having HIV knowledge. The knowledge was significant higher among women who were visited by NGO workers and have decision making power in the family, and lower among women who were victim of intimate partner violence in both area.

Table 3: Associated factors of having knowledge about HIV/AIDS within Bangladesh in 2014

Explanatory Variables	Knowledge about HIV/AIDS					
	Urban		p-value	Rural		p-value
	No	Yes		No	Yes	
Age (in years)						
15-24	264(16.1%)	1374(83.9%)	0.016	1236(36.0%)	2198(64.0%)	0.962
25-34	342(17.4%)	1623(82.6%)		1502(36.3%)	2639(63.7%)	
35-49	267(14.0%)	1635(86.0%)		1350(36.0%)	2397(64.0%)	
Education						
No education	472(40.9%)	681(59.1%)	<0.001	2021(66.2%)	1032(33.8%)	<0.001
Primary ^l	379(24.2%)	1187(75.8%)		1527(41.7%)	2133(58.3%)	
Secondary and above ^l	191(5.5%)	3257(94.5%)		680(13.6%)	4303(86.4%)	
Husband's education						
No education	481(37.4%)	805(62.6%)	<0.001	2136(56.6%)	1640(43.4%)	<0.001
Primary	336(23.8%)	1075(76.2%)		1326(38.5%)	2118(61.5%)	
Secondary & above	225(6.5%)	3244(93.5%)		766(17.1%)	3708(82.9%)	

Table Continued...

Economic status						
Poorest	263(50.4%)	259(49.6%)	<0.001	1575(57.7%)	1154(42.3%)	
Poor	139(33.6%)	275(66.4%)		1321(44.8%)	1625(55.2%)	
Middle	206(24.6%)	630(75.4%)		815(29.3%)	1970(70.7%)	<0.001
Rich	266(16.1%)	1385(83.9%)		420(19.8%)	1698(80.2%)	
Richest	168(6.1%)	2576(93.9%)		97(8.7%)	1021(91.3%)	
Marital status						
Married	916(16.0%)	4823(84.0%)	<0.001	3914(35.3%)	7177(64.7%)	<0.001
Others	126(29.4%)	302(70.6%)		314(51.9%)	291(48.1%)	
Age at marriage (in years)						
≤16	773(21.4%)	2833(78.6%)	<0.001	3276(40.5%)	4807(59.5%)	<0.001
>16	269(10.5%)	2292(89.5%)		952(26.3%)	2661(73.7%)	
Number of children						
≤2 children	518(15.6%)	2792(84.4%)	0.603	2365(35.8%)	4240(64.2%)	0.431
>2 children	355(16.2%)	1840(83.8%)		1723(36.5%)	2994(63.5%)	
Current contraceptive use						
Not using	493(20.5%)	1912(79.5%)		1943(39.0%)	3043(61.0%)	
Condom	28(4.2%)	635(95.8%)	<0.001	55(12.3%)	391(87.7%)	<0.001
Other methods	521(16.8%)	2578(83.2%)		2230(35.6%)	4034(64.4%)	
Reading newspaper/radio						
Not at all	987(21.7%)	3561(78.3%)	<0.001	4078(40.2%)	6064(59.8%)	<0.001
Yes	53(3.3%)	1560(96.7%)		142(9.3%)	1389(90.7%)	
Watching television						
Not at all	477(43.2%)	626(56.8%)	<0.001	3097(51.9%)	2867(48.1%)	<0.001
Yes	565(11.2%)	4499(88.8%)		1130(19.7%)	4601(80.3%)	
Visited community clinic						
No	896(17.1%)	4358(82.9%)	0.429	2810(39.9%)	4598(60.1%)	<0.001
Yes	146(16.0%)	767(84.0%)		1418(33.1%)	2870(66.9%)	
Visited by government health workers						
No	206(16.0%)	1083(84.0%)	0.956	855(34.2%)	1644(65.8%)	<0.001
Yes	26(16.1%)	135(83.9%)		135 (24.8%)	409(75.2%)	
Visited by NGO workers						
Not at all	187(17.4%)	887(82.6%)	0.013	835(34.2%)	1610 (65.8%)	<0.001
Yes	45(12.0%)	331(88.0%)		155(25.9%)	443(74.1%)	
Victim of intimate partner violence (IPV)						
No	667(14.5%)	3931(85.5%)	<0.001	2533(32.0%)	5384(68.0%)	<0.001
Yes	361(23.9%)	1149(76.1%)		1607(44.4%)	2013(55.6%)	
Decision making power about health care						
Do not have	404(21.2%)	1505(78.8%)	<0.001	1674(39.1%)	2603(60.9%)	<0.001
Have	512(13.4%)	3318(86.6%)		2240(32.9%)	4574(67.1%)	

Note: NGO, Non-Government Organization

Identification of determinants

Table 4 shows that women education is a vital factor of having knowledge about HIV/AIDS in both urban and rural Bangladesh. Females who have finished at least secondary education had 4.048 (CI: 2.438-6.721) times more knowledge about HIV/AIDS than

the illiterate urban women. On the other hand, in rural areas, the likelihood of having HIV/AIDS knowledge was increased among women who had completed primary (aOR=2.105, CI: 1.619-2.737) and secondary or higher education (aOR=4.190, CI: 3.160-5.556) than the illiterate women, respectively and also increased for rural women with husband who had completed secondary or higher

education (aOR=1.487, CI: 1.143-1.934) than the women with illiterate husband. The women from middle class (urban: aOR=1.482, CI: 0.828-2.656; rural: aOR=1.671, CI: 1.277-2.187), rich (urban: aOR=2.623, CI: 1.492-4.611; rural: aOR=2.136, CI: 1.526-2.991) and richest families (urban: aOR=4.365, CI: 2.270-8.394; rural: aOR=3.6, CI: 1.989-6.517) have greater likelihood of having knowledge of HIV/AIDS than the poor women in both areas. The likelihood of having HIV knowledge was decreased among women of other marital status rather than married (urban: aOR=0.455, CI: 0.365-0.567 and rural: aOR=0.505, CI: 0.429-0.596). In rural area, the chance of having HIV knowledge was increased among women of >16 years age at marriage (aOR=1.331, CI: 1.096-1.615) than the women who got married at ≤16 years of age and among couples who use condom (aOR=2.151, CI: 1.154-4.011) as contraceptive method than contraceptive non-users. The likelihood of having knowledge was increased among newspaper/radio readers (urban: aOR=4.979, CI: 2.242-11.056 and

rural: aOR=1.993, CI: 1.372-2.889) and who watch television (urban: aOR=2.129, CI: 1.404-3.228 and rural: aOR=2.345, CI: 1.904-2.889) frequently. Besides, rural women who visited community clinic have 1.2 times (aOR=1.2, CI: 0.995-1.448), were visited by government health workers have 1.509 times (aOR=1.509, CI: 1.178-1.934) higher knowledge regarding HIV. Similarly, the likelihood of having knowledge about HIV/AIDS was increased among women who were visited by NGO workers (urban: aOR=1.592, CI: 1.391 and rural: aOR=1.391, CI: 1.097-1.765) and who had decision making power about health care (urban: aOR=1.486, CI: 1.055-2.093 and rural: aOR=1.393, CI: 1.161-1.672) in the family than the women without NGO worker visit and decision making power in the family, respectively. In the rural area, victims of IPV have 0.795 (aOR=0.795, CI: 0.656-0.963) times lower chances to have HIV knowledge than the women who were not IPV victim.

Table 4: Logistic regression analysis to estimate the determinants of having knowledge about HIV/AIDS in Bangladesh in 2014

Explanatory variables	Urban			Rural		
	Adjusted OR	95% CI		Adjusted OR	95% CI	
		Lower	Upper		Lower	Upper
Education						
No education ^(R)	1.00	.....	.....	1.00	.....	.....
Primary	1.435	0.908	2.344	2.105***	1.619	2.737
Secondary & Above	4.048***	2.438	6.721	4.190***	3.160	5.556
Husband's education						
No education ^(R)	1.00	.....	.....	1.00	.....	.....
Primary	1.072	0.691	1.663	1.062	0.850	1.328
Secondary & Above	1.355	0.835	2.198	1.487***	1.143	1.934
Economic status						
Poorest ^(R)	1.00	.....	.....	1.00	.....	.....
Poor	1.402	0.767	2.564	1.199	0.954	1.507
Middle	1.482*	0.828	2.656	1.671***	1.277	2.187
Rich	2.623***	1.492	4.611	2.136***	1.526	2.991
Richest	4.365***	2.270	8.394	3.600***	1.989	6.517
Marital status						
Married ^(R)	1.00	.....	.....	1.00	.....	.....
Others	0.455***	0.365	0.567	0.505***	0.429	0.596
Age at marriage (in years)						
≤16 ^(R)	1.00	.....	.....	1.00	.....	.....
>16	1.358	0.942	1.959	1.331**	1.096	1.615
Current contraceptive use						
Not using ^(R)	1.00	.....	.....	1.00	.....	.....
Condom	1.327	0.639	2.880	2.151**	1.154	4.011
Other methods	1.157	0.792	1.692	1.096	0.907	1.325
Reading newspaper/radio						
Not at all ^(R)	1.00	.....	.....	1.00	.....	.....
Yes	4.979***	2.242	11.056	1.993***	1.372	2.889

Table Continued...

Watching television

Not at all ^(R)	1.00	.....	.....	1.00	.....	.....
Yes	2.129***	1.404	3.228	2.345***	1.904	2.889

Visited community clinic

No ^(R)	1.00	.....	.....	1.00	.....	.....
Yes	0.866	0.552	1.361	1.200*	0.995	1.448

Visited by government health workers

No ^(R)	1.00	.....	.....	1.00	.....	.....
Yes	1.436	0.849	2.430	1.509***	1.178	1.934

Visited by NGO health workers

Not at all ^(R)	1.00	.....	.....	1.00	.....	.....
Yes	1.592*	1.061	2.388	1.391**	1.097	1.765

Victim of intimate partner violence (IPV)

No ^(R)	1.00	.....	.....	1.00	.....	.....
Yes	0.801	0.555	1.154	0.795**	0.656	0.963

Decision making power about health care

Do not have ^(R)	1.00	.....	.....	1.00	.....	.....
Have	1.486*	1.055	2.093	1.393***	1.161	1.672

Note:“(R)” denotes reference category and significance at ***p<0.001, **p<0.01 and *p<0.05 levels
OR, odds ratio; CI, confidence interval

Discussion

In Bangladesh, a little increase of HIV/AIDS knowledge is observed in urban area whereas in rural area, it shows a good rising trend though the proportion of women with HIV/AIDS knowledge is much lower in this cluster than urban areas. Different socio-economic and demographic variables tragedies play a vital role in prompting HIV/AIDS. However, it is difficult in rural Bangladesh to rise HIV awareness through accurate knowledge, because Bangladesh has needed to develop the educational condition in poor rural areas and have poor believe and knowledge about HIV than urban women, even though there still exist prejudices. According to this study result, both urban and rural women have good level of knowledge about HIV transmission. Almost every woman knows that use of unsterilized syringe, unsafe blood transmission highly increases the risk of HIV infection. They also have good knowledge regarding mother to child HIV transmission process. But it is saddening but truth is, a good number of rural women do not agree with condom use can reduce the risk of HIV infection and they still believes in prejudice like HIV is a witchcraft, can transmit through mosquito bites etc. Additionally, a very few prejudices also exist in urban areas. Prior endeavors have a significantly higher HIV prevalence is observed among people who are unaware and have poor knowledge of the potential routes of HIV transmission.^{16,22} If adequate knowledge regarding HIV transmission and prevention is ensured then it will be very easy to reduce the prevalence of HIV/AIDS in our country.

However, the study results indicate that in both urban and rural area, women aged 35-49 years have a comparatively better HIV knowledge and especially the trend is rising among rural women. Females from the growing age (<25 years) are unprotected from fresh

skills, connecting to sexuality and imitation.¹⁴ which increases the risk of HIV infection. The deprived knowledge and awareness in the fresher cluster (<25 years) may be owing to the old-style community scheme especially in rural community that often disregard this cluster as a distinct unit who is preserved, neither as a kid nor as mature. In this regard, the women’s education has an immense impact on having better HIV/AIDS knowledge especially in rural area. Our study results regarding higher odds for educated women in showing consistency with several earlier studies.^{16,23} A prior study has termed education as “social vaccine” against HIV/AIDS.¹⁶ In both urban and rural area, a very good HIV knowledge in educated cluster is observed over the year 2004 to 2014 but illiterate rural women are still now struggling for poor knowledge. In this regard, Mondal et al.¹⁵ demonstrated that women with educated husband have higher chance to have better HIV knowledge.

Economic condition of women is a very important predictor of having HIV knowledge. In rural Bangladesh, a very high increasing knowledge trend of HIV is observed in poor community. This study results regarding higher likelihood is supporting prior studies. Besides, Mondal et al.²⁴ uncovered a positive association between economic status and misconception about HIV, poor household tends to more misconception in Bangladesh.

In rural Bangladesh, there is an intension is still prevailing to get female adolescents married at age <16 years. A lower odds of having HIV knowledge is revealed among women belongs to this category is supported by previous literature.²⁵ Furthermore, a prior endeavour has identified a significant impact of age at marriage on HIV epidemic in Japan.²⁶ Contraceptive use during sexual intercourse and proper family planning knowledge have been proven to be lucrative for not

only to protect unwanted birth but also from sexually transmitted diseases like HIV/AIDS.^{27, 28} This study reports that rural women who use condom as contraceptive during intercourse are more likely to have HIV knowledge compared to the non-contraceptive user. This finding is in agreement with the other studies.^{15, 27} In rural areas, there is an unwillingness of contraceptive use always remain due to religious orthodoxy.

Mass communication disclosure is a very important factor associated with the HIV knowledge. Females with entrance to mass communication (television, radio, newspapers etc.) have the chance to divide into their opinions and philosophies through their families and so this type of women have more knowledge and awareness about HIV/AIDS. According to this study report, women who got media exposure have a higher likelihood of knowledge about HIV/AIDS in both urban and rural area which is supported by preceding literatures.^{7,8,29} The publicity to such media can interconnect knowledge and consciousness about HIV/AIDS through the tune, newscast information, theatres, and movies that can intensely affect the approach and behaviour of the public.¹⁴ Besides, media can positively influence condom use practice during intercourse which can reduce HIV/AIDS risk.²⁹ The accessibility of media exposure is always higher in urban sector than the rural. So, social awareness program is specially needed in rural areas to implement in this regard as well as urban sector.

However, community clinic awareness, government and NGO health worker visits are also playing good role on increasing HIV knowledge in rural Bangladesh. This study identifies a higher likelihood of having knowledge is associated with women who were aware of community clinic, were visited by government and NGO health workers. Rural women can get informed about the etiology and transmission mode of HIV from these sources which helps AIDS prevention. Also, regular health worker visit can make women aware and prevent HIV infection. This study also found a positive association between IPV victimization and women's decision-making power in family about health care, and HIV knowledge, IPV victims and without the decision-making power about health care tends to poor HIV knowledge. Supporting this result, Jasmin et al.³⁰ describes that women with rights of decision-making power are affirmatively intended to have better HIV knowledge.

Social awareness against HIV needs to spread out whole over the country. Previous research has shown that the impact of peer-led HIV prevention programs to improve the knowledge of HIV/AIDS and motivates people to have better attitudes towards people living with HIV.^{31,32} In some circumstances, teaching is the way of delivering a message for any communication. The improved period through the improved step of teaching delivers a chance to have more reproductive health evidence, more use of health maintenance facilities, and sustenance from noble clusters.¹⁴

Limitations and strengths

This study had several limitations. Firstly, as this is a sensitive matter, some respondents were hesitated to give data. Secondly, we used the data to perform analysis was from a secondary data source. So, a few important factors that were missing in this study. Nevertheless, we have tried to depict a compact illustration of the current situation, trend and determinants of HIV/AIDS knowledge in comparison of the urban and rural area. Moreover, only a very few studies were conducted in this area of study in Bangladesh.

Enhancing the available information hopefully, this research will contribute to developing suitable interventions for raising knowledge and awareness about HIV/AIDS among women especially in the rural area of Bangladesh.

Conclusion

The HIV/AIDS knowledge especially among women is a very crucial public health matter due to its significantly straight connection with HIV infection and the absence of wellbeing services and circuitously with death. In Bangladesh, women from rural residence have poor level of knowledge regarding HIV than the urban residents. The results revealed that the respondent's husband's education, economic and marital status, reading newspaper/radio, watching TV, NGO health workers visit, women's decision-making power about health care are significantly associated with the knowledge about HIV/AIDS for both urban and rural women in Bangladesh. Alongside with these factors, age at marriage, condom use during intercourse, community clinic awareness, govt. health worker visits and victimization of IPV are also vital predictor of having HIV knowledge in rural Bangladesh.

To prevent HIV/AIDS, Bangladesh government should also consider encouraging the radio and TV channels to broadcast special programs that could increase the knowledge and consciousness among women about HIV/AIDS and improve the education intervention program by providing textbooks that contain more information on the sexual and reproductive system, especially for the primary and secondary schools. Also, peer-led HIV prevention programs should be implemented and frequent health worker visit should be ensured in this regard in rural area of Bangladesh.

Ethics statement

The Ministry of Health and Family Welfare, Dhaka, Bangladesh has given the ethical approval. The financial and technical assistance for the survey via USAID/Bangladesh was provided through the International Credit Finance (ICF). The worldwide Demographic and Health Surveys program is a part of the BDHS.²⁰

Competing Interests

Authors declare that, they have no competing interests.

Contributors' Statements

MMAK is responsible for the study design and writing the manuscript. MSK, MGM and NT have done the formal analysis. MNIM and MRI contributed to drafting the manuscript and critically revising it for important intellectual content. All the authors read and approved the final manuscript.

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