



GLOBAL JOURNAL OF MEDICAL RESEARCH: K
INTERDISCIPLINARY

Volume 18 Issue 4 Version 1.0 Year 2018

Type: Double Blind Peer Reviewed International Research Journal

Publisher: Global Journals

Online ISSN: 2249-4618 & Print ISSN: 0975-5888

Factors Determining Knowledge of HIV/AIDS among Bangladeshi Women

By Md. Jahirul Islam, Md. Murad Hossain, Sabrina Rahaman & Md. Zahid Hasan

Bangabandhu Sheikh Mujibur Rahman Science and Technology University

Abstract- South-Asian countries are considered to be a potential breeding ground for HIV epidemic. Although the prevalence of this incurable disease is low in Bangladesh, women still have been identified as more vulnerable group. The aim of this study is to assess the knowledge about HIV/AIDS and associated factors among the women in Bangladesh. The data used in this paper has been taken from Bangladesh Demographic Health Survey 2011. In this paper the sample of entire ever-married women aged between 15-49 years is approximately 991. For this paper the dependent variable is the "Knowledge of AIDS". The independent variables used in this study may be classified as demographic (age of the woman), socio-economic (woman's education, wealth index); location variables (urban /rural residence) and migration (number of months away from home); Family Planning (Exposure to Family Planning via Mass Media) and religion. All the potential confounders of knowledge of HIV/AIDS were being tested by chi square and then fit the binary logistic regression model to this data with the effects of the allied explanatory variables.

Keywords: HIV knowledge, logistic regression, bangladesh.

GJMR-K Classification: NLMC Code: WC 140



Strictly as per the compliance and regulations of:



© 2018. Md. Jahirul Islam, Md. Murad Hossain, Sabrina Rahaman & Md. Zahid Hasan. This is a research/review paper, distributed under the terms of the Creative Commons Attribution-Noncommercial 3.0 Unported License (<http://creativecommons.org/licenses/by-nc/3.0/>), permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Factors Determining Knowledge of HIV/AIDS among Bangladeshi Women

Md. Jahirul Islam^α, Md. Murad Hossain^σ, Sabrina Rahaman^ρ & Md. Zahid Hasan^ω

Abstract- South-Asian countries are considered to be a potential breeding ground for HIV epidemic. Although the prevalence of this incurable disease is low in Bangladesh, women still have been identified as more vulnerable group. The aim of this study is to assess the knowledge about HIV/AIDS and associated factors among the women in Bangladesh. The data used in this paper has been taken from Bangladesh Demographic Health Survey 2011. In this paper the sample of entire ever-married women aged between 15-49 years is approximately 991. For this paper the dependent variable is the "Knowledge of AIDS". The independent variables used in this study may be classified as demographic (age of the woman), socio-economic (woman's education, wealth index); location variables (urban /rural residence) and migration (number of months away from home); Family Planning (Exposure to Family Planning via Mass Media) and religion. All the potential confounders of knowledge of HIV/AIDS were being tested by chi square and then fit the binary logistic regression model to this cram with the effects of the allied explanatory variables.

Keywords: HIV knowledge, logistic regression, bangladesh.

I. INTRODUCTION

Among the incurable infectious diseases, acquired immune deficiency syndrome (AIDS) caused by the infection of human immune deficiency virus (HIV) has become a major global health problem in recent years. According to the UNAIDS [1], there were 36.7 million people living with HIV in 2015, which is 3.4 million higher than those of in 2010. In Asia and Pacific region, there were 5.1 million people living with HIV in 2015 [2], of which the South-Asian (SA) countries: China, India, and Indonesia account for about 75% of the total number of people living with HIV in this region [3]. In Bangladesh-a SA country, the prevalence of HIV is low (less than 0.1%) [4], which steadily increased since 1989 [5]. The reported number of people with HIV in Bangladesh increased by more than 300% (from 1207 in 2007 to 3674 in 2014) in seven years [6]. The recent estimates of the number of people living with HIV in Bangladesh in 2015 is about 9600, of which about 3200

are women aged 15 years and above [7]. Thus, Bangladesh with her low prevalence of HIV/AIDS, possesses a high risk of rapid spread of HIV/AIDS [5, 8-10].

There are many potential factors that are attributable to this increased risk of HIV infection and/or transmission: geographical and cultural proximity to India and Myanmar-two severely affected countries [8, 11], poverty, gender inequity, high levels of transitional sex [12], mobility of boatmen across the border area [13], and especially, the low-level knowledge about HIV/AIDS. With the vision of reducing the risk of HIV infection and transmission, we should concentrate on these potential factors, however, many of these factors are often linked with the country's health, demography, economy, politics, etc., which are not malleable enough to change or improvement. Instead, major concentration could be given on increasing the level of knowledge about HIV/AIDS, since the causes of HIV infection are known and can be escaped by being knowledgeable about HIV/AIDS. In the context of Bangladesh, the percentage of married women and married men with knowledge about HIV/AIDS were 67% and 87%, respectively, in 2007 [14]. This percentage increased only by 2% for married women and 1% for married men, respectively over the years 2007-2011 [15]. In 2014, Bangladesh Demographic and Health Survey (BDHS) identified female population as more vulnerable group than male population and observed that about 70% of the married women are knowledgeable about HIV/AIDS, which is very similar to that of documented in 2011 [6]. Accordingly, many studies [16, 17] reported that the level of knowledge among the men is higher compared to the women in Bangladesh. Moreover, the women bear the heavier onus of the consequences of the disease due to their standing in a less advantaged socio-economic position, limited access to sexually, and reproductive health care [18], and subsequently, women are considered to be more vulnerable to HIV infection and transmission [10]. In addition, the perception among the women in Bangladesh about HIV/AIDS is often contaminated with myths, facts, and rumors [19], which further contribute to HIV infection and/or transmission.

In this critical condition, to control HIV infection and/or transmission, preventive measures (e.g. increasing the level of knowledge) for women could be effective, which has been recommended in earlier

Author α: M.S student, Dept. of Statistics, Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Gopalganj-8100, Bangladesh. e-mail: sadid.shimul@gmail.com

Author σ: Assistant professor, Dept. of Statistics, Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Gopalganj-8100, Bangladesh.

Author ρ ω: Lecturer, Dept. of Statistics, Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Gopalganj-8100, Bangladesh.

studies [16, 20, 21]. Since any effective vaccine to completely cure from HIV/AIDS is not available yet [22], spreading correct knowledge about HIV/AIDS should be the very first step to raise awareness about HIV/AIDS. Lack of knowledge about HIV/AIDS is usually positively associated with misconception, confusion, social stigma, poor sex behavior [23], which contribute to the increase in HIV infection and transmission. Increasing women's knowledge about HIV/AIDS will facilitate long-term controlling of HIV/AIDS epidemic [17] and will still be effective even when there is limited/poor healthcare facilities. Assessing the current scenario of women's knowledge status in Bangladesh and identifying the associated factors will be helpful for government and non-government organizations to develop more structured and specific target program regarding HIV/AIDS prevention.

In this regard, Khan [21] investigated the adolescents married women (10–19 years) in Bangladesh and reported female education, media use, and condom use as potential predictors of women's knowledge about HIV/AIDS. Rahman, M.S. and Rahman, M.L. [16] studied married women of wider age group (15–49 years) and identified the use of media as a strong tool to spread HIV knowledge and, also reported socio-economic status as an important factor. Likewise, Yaya et al. [17] studied a sample of ever married women in Bangladesh and demonstrated a positive association between the women's knowledge and their respective husbands' increasing level of education. Although there have been notable research works conducted earlier to assess the knowledge status of married women in Bangladesh, most studies focused on a particular study period. There are only few studies [24] that examined the trends and determinants of knowledge about HIV/AIDS among the married women in Kenya over the years 1993–2009.

Studying the trends and determinants of women's knowledge will disclose more windows about the changing behavior of the associated factors and their varying effects over time. To best of our knowledge, no earlier studies in Bangladesh examined the trends and determinants associated with the knowledge about HIV/AIDS among the married women in Bangladesh. The main goal of the study is to analyze the data of BDHSs 2011, and investigate the factors associated with the ever-married women's knowledge about HIV/AIDS in Bangladesh. This study will help the government and policy makers to evaluate the present scenario of knowledge about HIV/AIDS among the women in Bangladesh. We expect this study will help in constructing necessary programs that might contribute to control HIV infection or AIDS disease in Bangladesh.

II. DATA METHODS AND MATERIALS

a) *Data Source*

The data used in this paper has been taken from Bangladesh Demographic Health Survey 2011. The sample in this survey is a stratified, nationally representative sample of households.

b) *Sample design*

The sample is based on two-stages, the first stage of sampling consists of 260 PSUs (82 in urban areas and 178 in rural areas) which was selected using systematic sampling with probability proportional to size. During the second stage of sampling selection, for all regions systematic sampling was performed on about 30 households per PSU on average in urban areas and about 36 households per PSU on average in rural areas, to obtain statistically reliable key demographic and health variables, giving a total sample size of 10,793 observations along with 4,743 variables. Further details are available in the Bangladesh Demographic and Health Survey 2011. In this paper the sample of entire ever-married women aged between 15–49 years is approximately 991. For this paper the dependent variable is the "Knowledge of AIDS" with category coded as 1 if yes and 0 if no. All the potential confounders of knowledge of AIDS were being tested in the binary logistic regression model. The mathematical analysis was performed using SPSS (version 16.0)

c) *Data processing*

All questionnaires for the BDHS were periodically returned to Dhaka for data processing at Mitra and Associates. The dealing out of the data composed began curly after the fieldwork originated.

The processing operation consisted of work place editing, coding of open-ended questions, data ingress, and editing inconsistencies initiated by the computer programs.

d) *Variables Used*

In the BDHS 2011 survey women were asked about many facets of lives that included household population and housing characteristics, fertility, family planning, proximate determinants of fertility, fertility preferences, infant and child mortality, adult and maternal mortality, HIV/AIDS related knowledge, attitudes and behavior, women empowerment and other related factors. Based on earlier studies on HIV/AIDS awareness, the variables were selected for this study and are discussed below. The variables used in this study may be classified as demographic (age of the woman), socio-economic (woman's education, wealth index); location variables (urban /rural residence) and migration (number of months away from home); Family Planning (Exposure to Family Planning via Mass Media) and religion.

e) *Statistical Technique*

i. *Chi-square statistic*

The chi square statistic is defined as

$$\chi^2 = \sum_i \frac{(O_i - E_i)^2}{E_i}$$

ii. *Odds and Odds Ratio*

Odds are the ratio of probability of an event will occur divided by the probability of it will not occur. Mathematically,

$$\text{Odds} = \frac{P(\text{Success})}{P(\text{Failure})} = \frac{P}{1-P} \quad \text{where } p \text{ is the probability of success}$$

Odds always have values greater than zero and if odds value is larger than one it means that success will occur more likely than failure. Odds ratio, as the name indicates, is the ratio of two Odds.

$$\text{Mathematically Odds ratio} = \frac{\frac{P_1}{1-P_1}}{\frac{P_2}{1-P_2}}$$

$$\ln \frac{P_i}{1-P_i} = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \dots + \beta_k x_{ki} \dots \dots \dots (1)$$

Where $p_i = P(Y_i = 1) = 1 - P(Y_i = 0)$, ($Y_i = 1$), ($Y_i = 0$) is the probability of success and failure of an observation i respectively. $\beta_0 = \log$ -odds when all x_{ji}

Where O_i is the observed number of cases in category i , and E_i is the expected number of cases in category i .

Here, P_1 and P_2 refer to the probability of success in group 1 and group 2 respectively.

iii. *Logistic Regression Model*

Binary logistic regression is a type of regression analysis where the dependent variable is a dummy variable. The logistic regression model use logit transform and formula represented as

are 0, $\beta_j =$ increase in log-odds when x_{ji} is increased by one unit, $j=1, \dots, k$, $e^{\beta_j} =$ increase in odds when x_{ji} is increased by one unit, $j=1, \dots, k$

III. RESULTS AND DISCUSSION

Table 1: The distribution of women by the knowledge on HIV/AIDS

Variables and their categories	Knowledge on HIV/AIDS		Total (%)	Pearson χ^2	P value
	Having Knowledge on HIV/AIDS (%)	Having no Knowledge on HIV/AIDS (%)			
Age of Women					
15-25	8.3	4.2	12.5	4.291	0.232
26-35	23.2	8.0	31.2		
36-45	28.3	12.9	41.2		
46-55	10.9	4.2	15.2		
Wealth Index					
Rich	17.2	7.0	24.1	.037	0.458
Poor	53.5	22.4	75.9		
Religion					
Muslim	69.4	2.9	72.8	8.194E2	0.000
Non-muslim	0.8	26.4	27.2		
No. of Month away from Home					
At home	28.1	10.8	39.9	0.821	0.202
Away from home	42.5	18.6	61.1		
Place of Residence					
Urban	45	3.2	48.2	2.288E2	0.000
Rural	25.6	26.1	51.8		
Radio					
Has Radio	58.1	16.3	74.5	76.588	0.000
Has no Radio	12.5	13.0	25.5		
Television (TV)					
Has TV	16.0	6.5	22.5	.061	0.437
Has no TV	54.6	22.9	77.5		
Educational Attainment					
Literate	59.6	4.1	63.8	4.402E2	0.000
Illiterate	11.0	25.2	36.2		

Basic information of the respondents' of Women by Knowledge on HIV/AIDS with some essential

variable is listed in table1. This investigation confirmed that women has knowledge on HIV/AIDS is highest

(28.3%) in the age interval of 36-45 and women has no knowledge on HIV/AIDS is the lowest (12.5%) in the age interval of 15-25. Being most of the people living in Bangladesh are poor. This investigation confirmed that women by knowledge on HIV/AIDS are highest (53.5%) in poor people and the lowest (7.0%) in the rich people. Being most of the people living in Bangladesh are Muslim, it was usual to have a larger portion from that religion group in the sample but the analysis presented the remarkable portion (69.4%) of having knowledge on HIV/AIDS in Muslim Women where as women has no knowledge on HIV/AIDS is lowest (26.4%) in non-Muslim women. Most the women in Bangladesh are stay at home. But the analysis show that the highest (42.5%) number women having knowledge on HIV/AIDS whom away from home where as the lowest (10.8%) number women having no knowledge on HIV/AIDS whom stay at home. The output of our study strongly supported the common phenomenon that the women living in urban area that the highest (45.0%) number women having knowledge on HIV/AIDS whereas the women living in rural area the lowest (25.6%) number women having knowledge on HIV/AIDS. In the perspective of Bangladesh most of the families are able to use radio. This paper show that the highest (58.1%) number of women having knowledge on HIV/AIDS who has radio but lowest (13%) number of women having no

knowledge on HIV/AIDS who has no radio. Most of the families are not able to use TV. This analysis gives that the highest (54.6%) number of women having knowledge on HIV/AIDS who has no TV but lowest (6.5%) number of women having no knowledge on HIV/AIDS who has TV. There was considerable differentiability in percentage of Women by Knowledge on HIV/AIDS in the context of respondents' education level. Women with literate the highest (59.6 %) percentage to have Knowledge on HIV/AIDS whereas that percentage (25.1%) for illiterate women has Knowledge on HIV/AIDS.

Bivariate analysis suggested that a considerable involvement ($\chi^2=8.194E2$, $df=1$, $p<0.05$) between religion from where the sample was drawn and dichotomous variable of women by the knowledge on HIV/AIDS. Respondents' education level, a very important variable significantly impacted on this dichotomous variable ($\chi^2=4.402E2$, $df=1$, $p<0.05$). In bivariate analysis, the other variables media (radio), place of the residence, appeared to be influential impact on HIV/AIDS because of having large chi-square standards and $p<0.05$ for every cases. In identifying explanatory variables for insertion in the logistic regression, 4 variables were considered, namely religion, religion, place of residential, expose to media (radio) and educational attainment.

Table 2: Binary Logistic Regression model with select independent variables

Predictors	Coefficient B	P value	Odds ratio
Religion (Ref: Non Muslim)			
Muslim	-6.661	0.000	0.001
Place of Residence (Ref: Rural)			
Urban	-2.654	0.000	0.070
Radio (Ref: Has no Radio)			
Has radio	-1.308	0.000	0.270
Educational Attainment (Ref: Illiterate)			
Literate	-1.098	0.000	0.310

IV. CONCLUSIONS

The first major objective of the study is to investigate the impact of the determinants having knowledge on HIV/AIDS in Bangladeshi women. Among all independent characteristics education plays a fundamental role having knowledge on HIV/AIDS in Bangladeshi women. This study proved that literate women have more knowledge on HIV/AIDS than the illiterate women. Radio plays an important rule to acquire knowledge on HIV/AIDS. Different times radio broad-cast different drama about HIV/AIDS. Hearing the drama women are more serious about it. Religion has also positive effect having knowledge on HIV/AIDS. Among Muslim percentage of having knowledge on HIV/AIDS is highest and lowest among the non-Muslim women in Bangladesh. In the perspective of Bangladesh most of the families are able to use radio. This paper

show that the highest number of women having knowledge on HIV/AIDS who has There are two different place of residence where the people lived. The behavior manners and cultures are more or less dissimilar in urban and rural people and hence the knowledge on HIV/AIDS is unlike. From the analysis we see that the Table 2 reports B coefficients and odds ratios for the variables retained in the select model, with religion, place of residence, radio and educational attainment of the respondents proving to be particularly significant in predicting of women by the knowledge on HIV/AIDS. The odds of having knowledge on HIV/AIDS in Muslim women is 1% higher than the odds of having knowledge on HIV/AIDS in non-Muslim women. Women living in the urban area are 0.070 times more knowledge on HIV/AIDS than those women living in the rural area. Those women who have radio are 0.270 times more knowledge on HIV/AIDS than those who have no radio.

Respondents who attained education are found to knowledge on HIV/AIDS 0.310 times more liable than the women who are illiterate in educational attainment.

Women who live in urban area have more knowledge than those who live in rural area.

REFERENCES RÉFÉRENCES REFERENCIAS

1. UNAIDS: Global aids update 2016. Technical report. 2016. <http://www.unaids.org/en/resources/documents/2016/Global-AIDS-update-2016>.
2. UNAIDS: The prevention gap report. Technical report. 2016. http://www.unaids.org/sites/default/files/media_asset/2016-prevention-gap-report_en.Pdf.
3. AVERT: Hiv and aids in asia& the pacific regional overview. Technical report. 2017. <https://www.avert.org/professionals/hiv-around-world/asia-pacific/overview>.
4. Nahar Q, Alam MS, Chowdhury EI, Azim T, Alam N, Saifi R, Khan SI, Oliveras E, Reza M. 20 years of hiv in bangladesh: experiences and way forward. Technical report. 2009. <http://citeweb.info/2009/05463>.
5. Islam MM, Conigrave KM. Hiv and sexual risk behaviors among recognized high-risk groups in Bangladesh: need for a comprehensive prevention program. *Int J Infect Dis.* 2008; 12(4):363–70. doi: 10.1016/j.ijid.2007.12.002. [Pub Med] [Cross Ref].
6. NIPOORT, Mitra and Associates, and ICF: Bangladesh demographic and health survey 2014. Technical report, National Institute of Population Research and Training (NIPOORT), Mitra and Associates, and ICF International, Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPOORT, Mitra and Associates, and ICF International. 2016. <http://microdata.worldbank.org/index.php/catalog/>
7. UNAIDS: HIV and AIDS Estimates. <http://www.unaids.org/en/regionscountries/countries/Bangladesh>.
8. Gibney L, Choudhury P, Khawaja Z, Sarker M, Islam N, Vermund S. Hiv/aids in bangladesh: an assessment of biomedical risk factors for transmission. *Int J STD & AIDS.* 1999; 10(5):338–46. doi: 10.1258/0956462991914087. [PubMed]
9. Gibney L, Choudhury P, Khawaja Z, Sarker M, Vermund S. Behavioural risk factors for hiv/aids in a low-hiv prevalence muslim nation: Bangladesh. *Int J STD & AIDS.* 1999; 10(3):186–94. doi: 10.1258/0956462991913862. [PMC free article] [PubMed]
10. ssain M, Mani KK, Sidik SM, Shahar HK, Islam R. Knowledge and awareness about stds among women in Bangladesh. *BMC Public Health.* 2014; 14(1):775. doi: 10.1186/1471-2458-14-775. [PMC free article] [PubMed].
11. Mondal NI, Takaku H, Ohkusa Y, Sugawara T, Okabe N, et al. Hiv /aids acquisition and transmission in Bangladesh: turning to the concentrated epidemic. *Jpn J Infect Dis.* 2009; 62(2):111–9. [PubMed].
12. UNICEF: Hiv and aids in bangladesh. Technical report. 2010. [https://www.unicef.org/bangladesh/HIV_AIDS\(1\).pd](https://www.unicef.org/bangladesh/HIV_AIDS(1).pd).
13. Gazi R, Mercer A, Wansom T, Kabir H, Saha NC, Azim T. An assessment of vulnerability to hiv infection of boatmen in tekna, bangladesh. *Confl Health.* 2008; 2(1):5. doi: 10.1186/1752-1505-2-5. [PMC free article] [PubMed] [Cross Ref].
14. NIPOORT, Mitra and Associates, and ICF: Bangladesh demographic and health survey 2007. Technical report, National Institute of Population Research and Training (NIPOORT), Mitra and Associates, and ICF International, Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPOORT, Mitra and Associates, and ICF International. 2009. <http://microdata.worldbank.org/index.php/catalog/2562>.
15. NIPOORT, Mitra and Associates, and ICF: Bangladesh demographic and health survey 2011. Technical report, National Institute of Population Research and Training (NIPOORT), Mitra and Associates, and ICF International, Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPOORT, Mitra and Associates, and ICF International. 2013. <http://microdata.worldbank.org/index.php/catalog/256>.
16. Rahman MS, Rahman ML. Media and education play a tremendous role in mounting aids awareness among married couples in bangladesh. *AIDS Res Therapy.* 2007; 4(1):10. doi: 10.1186/1742-6405-4-10. [PMC free article] [PubMed] [Cross Ref].
17. Yaya S, Bishwajit G, Danhouno G, Shah V, Ekholuenetale M. Trends and determinants of hiv/aids knowledge among women in bangladesh. *BMC Public Health.* 2016; 16(1):812. doi: 10.1186/s12889-016-3512-0. [PMC free article] [PubMed] [Cross Ref].
18. Garai J. Gender and hiv/aids in bangladesh: A review. *J Health Soc Sci.* 2016; 1(3):181–98.
19. Rahman MM, Kabir M, Shahidullah M. Adolescent knowledge and awareness about aids/hiv and factors affecting them in bangladesh. *J Ayub Med College Abbottabad.* 2009; 21(3):3–6. [PubMed].
20. Islam MT, Mostafa G, Bhuiya AU, Hawkes S, De Francisco A. Knowledge on, and attitude toward, hiv/aids among staff of an international organization in bangladesh. *J Health Popul Nutr.* 2002; 20(3): 271–8. [PubMed].
21. Khan MA. Knowledge on aids among female adolescents in bangladesh: evidence from the

- bangladesh demographic and health survey data. *J Health PopulNutr.*2002; 20(2):130–7. [PubMed].
22. Myhre L, June S, Flora A. Hiv/aids communication campaigns: progress and prospects. *J Health Commun.*2000; 5(sup1):29–45. doi: 10.1080/108107300126731. [PubMed] [Cross Ref].
 23. Varni SE, Miller CT, Solomon SE. Sexual behavior as a function of stigma and coping with stigma among people with hiv/aids in rural new england. *AIDS Behav.* 2012; 16(8):2330–9. doi: 10.1007/s10461-012-0239-5. [PMC free article] [PubMed] [Cross Ref].
 24. Ochako R, Ulwodi D, Njagi P, Kimetu S, Onyango A. Trends and determinants of comprehensive hiv and aids knowledge among urban young women in kenya. *AIDS Res Ther.* 2011; 8(1):11. doi: 10.1186/1742-6405-8-11. [PMC free article] [PubMed] [Cross Ref].

