

Social Determinants of Poor Knowledge on HIV Among Nepalese Males: Findings from National Survey 2011

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Abstract Since the first case detection in Nepal in 1988, the number of cases of Human Immunodeficiency Virus (HIV) are increasing. Limited studies exist concerning the knowledge on HIV among the Nepalese men. This study aimed to examine the social determinants of poor knowledge on HIV among Nepalese men aged 15–49 years based on Nepal Demographic and Health Survey (NDHS), 2011. This study is based on the secondary data of NDHS 2011. HIV knowledge was assessed by using structured questionnaire. A Chi square test followed by logistic regression was performed to find the association of social determinants with outcome variables. Of the 3,991 participants, 1,217 (30.5 %) had comprehensive knowledge and the majority (69.5 %) had poor knowledge on HIV. More than half (54.6 %) reported that mosquito bite can transmit HIV and 26.5 % reported that sharing food can transmit HIV. Respondents who were uneducated [aOR 10.782; 95 % CI (6.673–17.421)], were manual workers [aOR 1.442; 95 % CI (1.152–1.804)], were poor [aOR 1.847; 95 % CI (1.350–2.570)]; lived in the the Eastern region [aOR 2.203 (1.738–2.793)], or in the Mountain [aOR 1.542; 95 % CI (1.132–1.864)]; did not read newspaper/magazine at all [aOR 1.454; 95 % CI (1.142–1.851)] and did not listen to the

radio at all [aOR 1.354; 95 % CI (1.046–1.752)] were likely to have poor knowledge of HIV. HIV prevention programs should include men incorporating appropriate educational intervention to increase their knowledge.

Keywords Cross Sectional Survey · Demographic and Health Survey · HIV · Knowledge · Mode of transmission · Nepal · Social determinant

Introduction

Since the first case was detected in Nepal in 1988, the number of Human Immunodeficiency Virus (HIV) infections are increasing. As of August 2010, a total of 16,262 HIV were reported officially in Nepal [21]. A current estimate suggested that 63,528 people are currently living with HIV and AIDS in Nepal [21] and majority of them are male [15, 22]. There are three major groups based on the risk of getting HIV in Nepal—most at risk group, high risk group and low risk group. Injection drug users, men having sex with men, male sex workers, female sex workers, migrants and spouse of prison inmates are regarded as the most at risk population in Nepal; and young adults, uniformed service men and women, street children and trafficked girls are identified as high risk groups in Nepal [15, 20, 22]. The remaining population are in low risk group. The low risk group accounts for 54 % of all HIV cases in Nepal [21]. At present, the majority of HIV/AIDS prevention programs are targeting the most at risk population only. It is likely that the youths and adults from rural areas are vulnerable of having risk behaviours, that includes, sex workers and injecting drug user [23, 27, 29]. The national HIV/AIDS strategy stated that more and more low risk men are being infected in recent years in Nepal [22]. Therefore, the focus on general

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population, the low risk group, should not be neglected for HIV prevention efforts.

Given that there is widespread poverty in Nepal, the impact of HIV will hit in many ways [22]; United Nations Children's Fund [34]. First, it will reduce workforce due to large number of people of productive age (15–49 years) having HIV. Second, the demand to respond HIV prevention and treatment will be very high. Although costing of HIV treatment and care is not available from Nepal; an estimate from South Africa [10] reported that a median 30 days of pre antiretroviral therapy would cost USD 404; and it would cost USD 2,502 and USD 1,372 antiretroviral therapy for the first and the second year of treatment. This estimate was based on the cost of 2007; therefore, it needs to be adjusted for increase in health care cost such as any change in the cost of antiretroviral medicine and inflation rate. This calculation suggests that a poor family will be the hardest hit by HIV. Although epidemiological evidences are mixed, it is evident that poverty coupled with increased mobility and less education increases vulnerability to HIV [8, 35].

Nepal has achieved a significant progress in reducing HIV progress during the last decade and a more rapid decline in most at risk groups. As guided by National HIV and AIDS strategies (2006–2011 and 2011–2016) [20, 22], the majority of the efforts of HIV and AIDS control in Nepal are focussed on the most at risk and on at risk population. Few studies have been undertaken on exploring men's knowledge of HIV. Given that a majority of households in the rural area and a significant portion of households in urban areas have at least one male member outside of home, it is essential to know the status of knowledge on all male population of the country [14, 24]. Likewise, a number of studies have found that men are more likely to involve in risky health related behaviours than females; and they also tend to deny the use of protective measures [13, 33]. For these reasons, it becomes essential to assess the knowledge among Nepalese men on HIV.

Several studies have reported on knowledge, attitude and treatment seeking aspect of HIV in developing countries. Sociodemographic factors such as age, education, gender, religion, ethnicity, and access to information were reported as important determinants for good knowledge on HIV [6, 9]. Rural urban difference in knowledge of HIV has also been reported with urban residents reporting higher knowledge on HIV than their rural counterparts. Likewise, living in poor household and disadvantaged neighbourhood was also related to poor knowledge on HIV/AIDS. Such economic deprivation also increases misconception on HIV [6]. Furber et al. [7] conducted a systematic review and found that there is lack of research exploring the knowledge of general population of Nepal related to HIV.

Updated knowledge and exploring who are at risk of poor knowledge on HIV helps to design, and implement prevention programs; and justify resource allocation. Knowledge on the social determinants of HIV helps the Nepalese health system to create a supporting environment through social change process—change in policy, guidelines and priority of the program [22, 35]. While a number of Nepalese studies have reported on HIV on migrants [21, 25, 26], female sex workers [5], student population [1], injecting drug users [28], women [31]; very limited has been explored on general male population. This study aimed to examine the social determinants of poor knowledge on HIV among Nepalese Men aged 15–49 years based on Nepal Demographic and Health Survey (NDHS), 2011.

Methods

Data Source

This study utilised the Male dataset of nationally representative study—NDHS 2011. NDHS is a multistage cross sectional study. The survey used three sets of questionnaires to collect the information—household questionnaire, mother's questionnaire and men's questionnaire [19]. The male dataset includes information relevant to men's health. In NDHS 2011, 15–49 years men were surveyed from every third household.

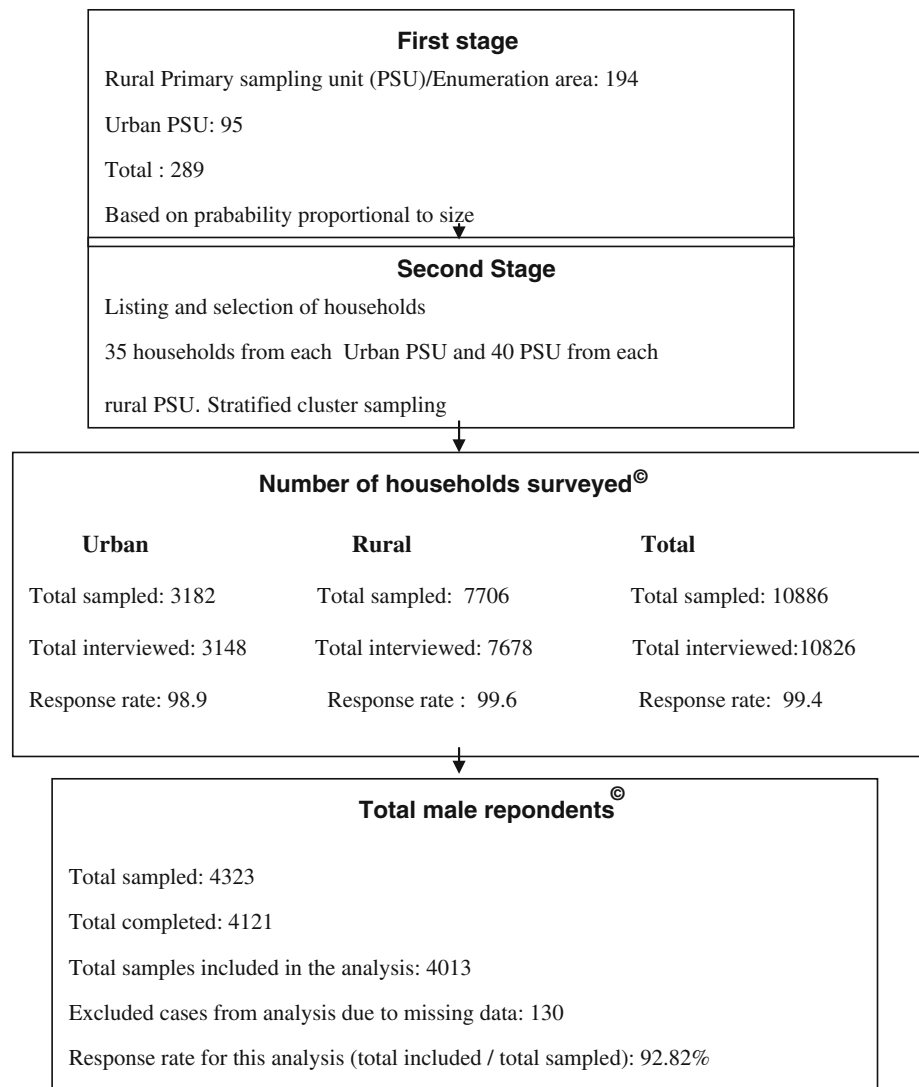
Sampling Method

Figure 1 describes the summary of the process of selecting households and the sampling of NDHS 2011 [19]. A total of 10,826 households, and 4,121 men were included in the survey (unweighted). A total of 4,013 (unweighted) cases were included in the study. The study had the response rate of 92.82 % for mens. The detailed description of the study is elaborated in the relevant publicly available NDHS report 2011 [19]. (Fig. 1: adapted from Sreeramareddy et al. [32]).

Outcome Variable

Outcome variable for this study is comprehensive knowledge on HIV. DHS guide [30] defines comprehensive knowledge on HIV as “knowing consistent condom use, having one uninfected faithful partner can reduce the chances of getting HIV virus, knowing that a healthy looking person can have the AIDS (HIV) virus and rejecting two common local misconceptions—HIV can be transmitted by mosquito bites and HIV can be transmitted by sharing food with a person who has AIDS”. NDHS 2011 categorised knowledge into dichotomous variables—

Fig. 1 Selection of sample and selection of sample for analysis (Adapted from Sreeramareddy et al. [32].[©]: the household and individual number represents unweighted cases



having comprehensive knowledge and not having comprehensive knowledge based on a set of questions [6, 19].

1. Can people reduce their chance of getting the AIDS* virus by having just one uninfected sex partner who has no other sex partners?
2. Can people reduce their chance of getting the AIDS virus by using a condom every time they have sex?
3. Is it possible for a healthy-looking person to have the AIDS virus?
4. Can people get the AIDS virus from mosquito bites?
5. Can people get the AIDS virus by sharing food with a person who has AIDS?

(*Note: AIDS was used synonymously for HIV).

From the response of these questions (“Yes” to questions 1, 2, and 3; and “No” to questions 4 and 5), we created a dichotomus variable; having comprehensive knowledge = 0, and poor knowledge = 1 for our analysis.

Explanatory Variables

The explanatory variables included in this study are listed in the Table 1. NDHS used wealth index to measure the economic status of family and derived from principal component analysis of 40 assets within the household. Thus calculated score was divided into five quintiles [19, 30]. Ethnicity was divided into three sub-categories; (1) advantaged (2) relatively disadvantaged (Janjati) (3) relatively disadvantaged (dalit) [4, 16]. Advantaged included Brahmin, Chhetri, and Newar. Relatively disadvantaged included indigenous group (Hill and Terai Janjati) and Muslim. Relatively disadvantaged (Dalit) included the Terai dalit and Hill dalits. The ecological regions are horizontal sections of the country based on the altitude and climate of the place. The development regions are vertical sections running from North to South.

Table 1 Characteristics of respondents

Factor	Number	Percentage
Demographic factors		
Age of the respondents		
15–24	1,632	40.9
25–35	1,161	29.1
36 and 49	1,198	30.0
Marital status		
Married/defacto	1,459	36.6
Single/separated/divorced/	2,532	63.4
Sociocultural factors		
Education		
No education	481	12.1
Primary	776	19.4
Secondary	2,102	52.7
Higher	632	15.8
Occupation		
Agriculture	1,192	29.9
Professional/clerical/service	1,283	32.1
Manual (skilled/unskilled)	962	24.1
Not working/not specified	554	13.9
Ethnicity		
Advantaged	1,950	48.8
Relatively disadvantaged (Janjati)	1,548	38.8
Relatively disadvantaged (Dalit)	494	12.4
Religion		
Hindu	3,364	84.3
Others	627	15.7
Wealth quintile		
Poorest	5,54	13.9
Poor	654	16.4
Middle	809	20.3
Richer	913	22.9
Richest	1,061	26.6
Spatial factor		
Place of residence		
Urban	711	17.8
Rural	3,280	82.2
Development region		
Eastern	985	24.7
Central	1,376	34.5
Western	785	19.7
Mid-western	464	11.6
Far-western	381	9.5
Ecological region		
Mountain	238	6.0
Hill	1,616	40.5
Terai	2,138	53.6

Table 1 continued

Factor	Number	Percentage
Access to information		
Reading newspaper or magazine		
Not at all	1,376	34.5
Less than once a week	1,212	30.4
At least once a week	1,404	35.2
Frequency of watching television		
Not at all	617	15.5
Less than once a week	1,096	28.5
At least once a week	2,378	56.0
Frequency of listening radio		
Not at all	517	12.9
Less than once a week	1,096	27.5
At least once a week	2,378	59.6

Statistical Analysis

The prevalence of correct knowledge and having misconceptions were reported as proportion (%). The association of outcome variable with explanatory variables was tested by using Chi square test (χ^2). The association of the significant variables was further tested by using unadjusted logistic regression followed by multiple logistic regression. Unadjusted odds ratio (OR) and adjusted odds ratio (aOR) with 95 % confidence interval (CI) were reported for regression analysis. A *p* value less than equal to 0.05 was considered statistically significant. Weighted analysis was performed by considering individual weight while reporting the prevalence [30].

Ethics

The survey has obtained ethical approval from Nepal Health Research Council and Institutional review board in Calverton, Maryland, USA. The first author obtained permission to use the dataset from Macro International (research agency) as the dataset was available for public use.

Results

Characteristics of Respondents

Of the 3,991 weighted cases included in the study, the mean age of the respondent was 28.05 (SD 10.10) years. The younger age group (15–24 years) comprised 40.9 % of the total respondents. Almost four in ten (36.6 %) were

Table 2 Knowledge on HIV among Nepalese males aged 15–49 years

Outcomes	Response	Percentage
Correct knowledge (N = 3,991)		
Using condoms regularly prevents HIV (yes)	3,683	92.3
Limiting the number of faithful sexual partners prevents HIV(yes)	3,674	92.1
Believes a healthy-looking person can have HIV (yes)	3,521	88.2
Misconceptions		
Believes HIV is transmitted through mosquito bites (yes)	2,179	54.6
Believes that sharing food with a person who has HIV or AIDS (yes)	1,075	26.5
Comprehensive knowledge (correct knowledge and no misconceptions) (N = 3,991)	1,217	30.5
Poor knowledge (N = 3,991)	2,774	69.5

Table 3 Factors associated with knowledge on HIV

Factor	Knowledge		Chi square <i>p</i> value
	Poor knowledge n (= 2,774) [%]	Comprehensive knowledge n (= 1,217) [%]	
Demographic factors			
Age of the respondents (in years)			<i>p</i> < 0.001
15–24	1,068 (65.5)	563 (34.5)	
25–35	825 (71.0)	337 (29.0)	
36 and 49	881 (73.5)	317 (26.5)	
Marital status			<i>p</i> < 0.001
Single/separated/divorced/	913 (62.6)	546 (37.4)	
Married/defacto	1,862 (73.5)	671 (26.5)	
Sociocultural factors			
Education			<i>p</i> < 0.001
No education	456 (94.8)	25 (5.2)	
Primary	684 (88.3)	91 (11.7)	
Secondary	1,370 (65.2)	731 (34.8)	
Higher	263 (41.5)	370 (58.5)	
Occupation			<i>p</i> < 0.001
Agriculture	949 (79.6)	243 (20.4)	
Professional/clerical/service	738 (57.6)	544 (42.4)	
Manual (skilled/unskilled)	780 (81.1)	182 (18.9)	
Not working/not specified	306 (55.2)	248 (44.8)	
Ethnicity			<i>p</i> < 0.001
Advantaged	1,232 (62.3)	717 (36.8)	
Relatively disadvantaged (Janjati)	1,142 (73.8)	406 (26.2)	
Relatively disadvantaged (Dalit)	400 (81.0)	94 (19.0)	
Religion			<i>p</i> < 0.002
Hindu	2,305 (68.5)	1,059 (31.5)	
Others	469 (74.8)	158 (25.2)	
Wealth quintile			<i>p</i> < 0.001
Poorest	476 (85.9)	78 (14.1)	
Poor	535 (81.7)	120 (18.3)	
Middle	619 (76.5)	190 (23.5)	
Richer	591 (64.7)	322 (35.3)	
Richest	553 (52.2)	507 (47.8)	

Table 3 continued

Factor	Knowledge		Chi square <i>p</i> value
	Poor knowledge n (= 2,774) [%]	Comprehensive knowledge n (= 1,217) [%]	
Spatial factor			
Place of residence			<i>p</i> < 0.001
Urban	421 (59.2)	290 (40.8)	
Rural	2,353 (71.8)	926 (28.2)	
Development region			<i>p</i> = 0.022
Eastern	718 (72.9)	267 (27.1)	
Central	960 (69.8)	416 (30.2)	
Western	518 (66.0)	267 (34.0)	
Mid-western	323 (69.6)	141 (30.4)	
Far-western	254 (66.7)	127 (33.3)	
Ecological region			<i>p</i> < 0.001
Mountain	189 (79.7)	48 (20.3)	
Hill	1,074 (66.5)	541 (33.5)	
Terai	1,511 (70.7)	627 (29.3)	
Access to information			
Reading newspaper or magazine			<i>p</i> < 0.001
Not at all	1,177 (85.5)	199 (14.5)	
Less than once a week	860 (71.0)	352 (29.0)	
At least once a week	738 (52.6)	666 (47.4)	
Frequency of watching television			<i>p</i> < 0.001
Not at all	524 (84.9)	93 (15.1)	
Less than once a week	879 (77.2)	259 (22.8)	
At least once a week	1,371 (61.3)	866 (38.7)	
Frequency of listening radio			<i>p</i> < 0.001
Not at all	392 (75.8)	125 (24.2)	
Less than once a week	795 (72.6)	300 (27.4)	
At least once a week	1,587 (66.7)	792 (33.3)	

married, more than half had either secondary (52.7 %) or higher education (15.8 %). Agriculture was the major occupation for one in three (29.9 %); almost half of all respondents were from advantaged ethnic group (48.8 %) and the vast majority (84.3 %) were Hindu by religion. Four in ten belonged to either poor (16.4 %) or the poorest (13.9 %) households. The majority were from rural area (82.2 %) and Terai (53.6 %). As for the access to information, 35.2 % read magazine, 56 % watched television and 59.6 % listened to the radio at least once a week.

HIV Knowledge Status

Table 2 presents the outcome variable; and its knowledge and misconception related responses. A vast majority (>92 %) knew that using condom can avoid HIV; 92 % reported having limited and faithful partner can avoid HIV and 88.2 % reported that a healthy looking person can have HIV. A total of 54.6 % reported that mosquito bite can transmit HIV and 26.5 % reported that sharing food can

transmit HIV. Overall, 1,217 (30.5 %) had comprehensive knowledge. A vast majority (69.5 %) had poor knowledge on HIV (Table 2).

Social Determinants of Poor Knowledge on HIV

Table 3 compares the respondent characteristics by level of HIV knowledge. The two groups are significantly different in all the characteristics studied. Table 4 presents the result of multivariable regression analysis. Education, occupation, wealth quintile, development region, ecological region, reading newspaper and listening to the radio were the significant determinants of comprehensive HIV knowledge. The respondents were more likely to have poor knowledge of HIV if they had no education [aOR 10.782; 95 % CI (6.673–17.421)], primary education [aOR 6.399; 95 % CI (4.708–8.697)]; were manual workers [aOR 1.442; 95 % CI (1.152–1.804)] or agriculturists [aOR 1.280; 95 % CI (1.035–1.583)], were from the poorest quintile [aOR 1.847; 95 % CI (1.350–2.570)] households. Similarly, respondents

Table 4 Factors associated with poor knowledge on HIV: unadjusted and adjusted odds ratio

Factor	Total	Poor knowledge	Uadjusted odds ratio (95 % CI)	Adjusted odds ratio (95 % CI)
Age of the respondents			$p < 0.001$	$p = 0.258$
15–24	1,632	1,068 (65.5)	1.00	1.00
25–35	1,161	825 (71.0)	1.234 (1.052–1.448)	0.823 (0.651–1.040)
36 and 49	1,198	881 (73.5)	1.458 (1.240–1.715)	0.850 (0.658–1.099)
Marital status			$p < 0.001$	$p = 0.274$
Single/separated/divorced/	1,459	913 (62.6)	1.00	1.00
Married/defacto	2,532	1,862 (73.5)	1.633 (1.425–1.871)	1.100 (0.927–1.304)
Education			$p < 0.011$	$p < 0.001$
Higher	632	263 (41.5)	1.00	1.00
Secondary	2,102	1,370 (65.2)	2.869 (2.399–3.432)	2.075 (1.708–2.520)
Primary	776	684 (88.3)	12.738 (9.697–16.733)	6.399 (4.708–8.697)
No education	481	456 (94.8)	25.898 (16.801–39.921)	10.782 (6.673–17.421)
Occupation			$p < 0.001$	$p = 0.001$
Professional/clerical/service	1,283	738 (57.6)	1.00	1.00
Agriculture	1,192	949 (79.6)	0.344 (0.289–0.410)	1.280 (1.035–1.583)
Not working/not specified	554	306 (55.2)	1.069 (0.874–1.308)	0.925 (0.745–1.149)
Manual (skilled/unskilled)	962	780 (81.1)	0.302 (0.248–0.367)	1.442 (1.152–1.804)
Ethnicity			$p < 0.001$	$p = 0.972$
Advantaged	1,950	1,232 (62.3)	1.00	1.00
Relatively disadvantaged (Janjati)	1,548	1,142 (73.8)	1.709 (1.476–1.979)	1.023 (0.844–1.240)
Relatively disadvantaged (Dalit)	494	400 (81.0)	2.314 (1.822–2.940)	1.011 (0.768–1.332)
Religion			$p < 0.001$	$p = 0.252$
Hindu	3,364	2,305 (68.5)	1.00	1.00
Others	627	469 (74.8)	1.489 (1.224–1.812)	1.135 (0.914–1.410)
Wealth quintile			$p < 0.001$	$p < 0.001$
Richest	1,061	553 (52.2)	1.00	1.00
Richer	913	591 (64.7)	1.675 (1.397–2.008)	1.083 (0.885–1.324)
Middle	809	619 (76.5)	2.889 (2.352–3.549)	1.428 (1.124–1.815)
Poor	654	535 (81.7)	3.766 (3.015–4.703)	1.581 (1.202–2.078)
Poorest	554	476 (85.9)	5.791 (4.525–7.411)	1.847 (1.350–2.570)
Place of residence			$p < 0.001$	$p = 0.550$
Urban	711	421 (59.2)	1.00	1.00
Rural	3,280	2,353 (71.8)	1.830 (1.594–2.102)	0.947 (0.792–1.132)
Development region			$p < 0.001$	$p < 0.001$
Far-western	381	254 (66.7)	1.00	1.00
Mid -Western	464	323 (69.6)	1.313 (1.052–1.638)	1.239 (0.967–1.588)
Western	785	518 (66.0)	1.078 (0.864–1.345)	1.498 (1.163–1.929)
Central	1,376	960 (69.8)	1.428 (1.158–1.762)	2.067 (1.624–2.630)
Eastern	985	718 (72.9)	1.722 (1.391–2.132)	2.203 (1.738–2.793)
Ecological region			$p < 0.001$	$p = 0.005$
Hills	1,616	1,074 (66.5)	1.00	1.00
Mountain	238	189 (79.7)	0.477 (0.381–0.597)	1.542 (1.132–1.864)
Terai	2,138	1,511 (70.7)	0.930 (0.807–1.0722)	1.201 (1.021–1.414)
Reading newspaper or magazine			$p < 0.001$	$p = 0.003$
At least once a week	1,404	738 (52.6)	1.00	1.00
Less than once a week	1,212	860 (71.0)	1.976 (2.713)	1.305 (1.085–1.568)
Not at all	1,376	1,177 (85.5)	5.664 (4.711–6.809)	1.454 (1.142–1.851)

Table 4 continued

Factor	Total	Poor knowledge	Uadjusted odds ratio (95 % CI)	Adjusted odds ratio (95 % CI)
Frequency of watching television			$p < 0.011$	$p = 0.472$
At least once a week	2,378	1,371 (61.3)	1.00	1.00
Less than once a week	1,096	879 (77.2)	2.061 (1.759–2.415)	1.089 (0.896–1.324)
Not at all	617	524 (84.9)	3.6695 (2.965–4.605)	1.184 (0.885–1.585)
Frequency of listening radio			$p < 0.001$	$p = 0.045$
At least once a week	2,378	1,587 (66.7)	1.00	1.00
Less than once a week	1,096	795 (72.6)	1.335 (1.144–1.558)	1.138 (0.956–1.356)
Not at all	517	392 (75.8)	1.713 (1.366–2.148)	1.354 (1.046–1.752)

–2loglikelihood ratio: 4,275.196; df 16

Ecological region was replaced by development region in the final model to avoid interaction of these two variables

from the Eastern region [aOR 2.203; 95 % CI (1.738–2.793)], Central [aOR 2.067; 95 % CI (1.624–2.630)] and the Western region [aOR 1.498; 95 % CI (1.163–1.929)]; Terai [aOR 1.201; 95 % CI (1.021–1.414)] and and from Mountain [aOR 1.542; 95 % CI (1.132–1.864)] were more likely to have poor knowledge. Based on access to the source of information, the individuals who did not read newspaper/magazine at all [aOR 1.454; 95 % CI (1.142–1.851)] and did not listen to the radio at all [aOR 1.354; 95 % CI (1.046–1.752)] were more likely to have poor knowledge on HIV.

Discussion

The National HIV/AIDS Strategies (2011–2016 and 2006–2011) aim to reduce new HIV infections by 50 % and HIV related deaths by 25 %, by 2016 [22]. This study found that the majority of the respondents had poor knowledge on HIV. Surprisingly, more than half agreed that HIV is transmitted by mosquito bite. Almost nine in ten person did know the sexual mode of transmission of HIV. Complete knowledge including clarification of misconceptions are essential to reduce stigma and discrimination related to HIV [9, 12]. In Nepal, like in other developing countries, people living with HIV and AIDS have stigma and face discrimination due to their HIV positive status [3]. A number of events of discrimination against them in public and health facilities have been reported from Nepal [12]. Jha and Madison [12] further reported that health workers even denied to provide health service; and the main reason behind this was the stigma associated with HIV in Nepalese community. Therefore, the current findings should be taken as an evidence for further action to provide complete knowledge and clarification of misconceptions regarding HIV.

Education, occupation, wealth status, residence and access to information (reading magazine and listening radio) were the significant social determinants of knowledge on

HIV. Our finding that educated people have better knowledge on HIV is consistent with other studies [2, 32, 33]. A less educated person is likely to have less literacy skills and access to the information. For instance, it is reported that one grade of education can reduce the HIV infection by 7 % [2]. In our study, the individuals from higher wealth quintile were more likely to have more knowledge on HIV and similar conclusion has been reported in a review [8].

Access to information is important to acquire knowledge. Gupta and Mitra [9] reported that having television at home was a major determinant of having good knowledge in India. They further added that listening to the radio had significant effect to increase knowledge on HIV. In our study, it was found that not reading newspaper and not listening to radio was associated with poor knowledge. A number of health education and mass awareness programs are broadcasted from radio in Nepal [18] and listening to radio may have contributed to increase the knowledge. Reading newspaper is associated with education and urban areas. Because more educated people and urban areas are mainly located in Hill region, people from this region are more likely to have better knowledge of HIV.

The Far-western region of Nepal have higher proportion of HIV infection than other development regions [25, 26]. It may be the reason that people from this region knew more about HIV by perceiving themselves more at risk due to higher prevalence of HIV among male migrants, higher mortality due to HIV, and higher prevalence HIV among housewives [21, 24, 26, 27]. According to health belief model, perceived susceptibility and perceived severity motivates individuals to acquire the knowledge [11, 17]. Further, Far-western region was more focussed for awareness and prevention programs [20, 25].

Public Health Implications of the Study

Our study reported that the comprehensive knowledge was poor among the Nepalese men. Despite that Nepal has been

successful in reducing the prevalence of HIV at population level to 0.33 % during last decade [22]. It seems that there is need of further focus to increase knowledge, and mostly to clarify the misconceptions. Given that education was directly associated with knowledge, it highlights the need of educational interventions focused on the poorer and less educated section of population. Based on the 2006–2011 and 2011–2016 strategy, the Ministry of Health and Population has also stated that there is need to increase the coverage of program based on epidemic situation and geographic prioritisation [22]. Our result of regional difference in knowledge on HIV gives further evidence to focus on the Eastern, and Western development regions.

Strengths and Limitations

This study used the large sample size representing the entire country. However the mode of transmission included only the sexual mode while there are also other transmission modes [19]. Future studies that include other modes of HIV transmission and also female population are needed. However, the current definition is useful for assessing the knowledge of the major mode (unprotected sex) of transmission which accounts for nine in ten cases of HIV in Nepal. Another limitation of this study is its cross sectional nature which does not allow to draw causal inference.

Conclusion

Our analysis showed that the majority (69.5 %) had poor knowledge of HIV. The analysis indicated that the lower education group, the lower economic group, and the persons from manual and agriculture occupation were more at risk of having poor knowledge. Likewise, people from the Terai region and the Mountain region; and from the Eastern region and the Central region had poor knowledge. Consequently, more educational and communication programs need to be target in these groups of men and regions.

Conflict of interest We declare we have no conflict of interest.

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