

## Gender Differences in Knowledge and Risk Perception towards HIV/AIDS among Rohingyas in Cox's Bazar, Bangladesh

Shihabul Islam<sup>a\*</sup> , Shah Ehsan Habib<sup>a</sup> 

<sup>a</sup>Department of Sociology, University of Dhaka, Dhaka 1000, Bangladesh.

### ARTICLE INFO

#### ORIGINAL ARTICLE

#### Article History:

Received: 11 Sep 2021

Revised: 15 Oct 2021

Accepted: 23 Nov 2021

#### \*Corresponding Author:

Shihabul Islam

#### Email:

shihabshaun10@gmail.com

Tel: +88 01521585321

#### Citation:

Islam Sh, Habib ShH. Gender Differences in Knowledge and Risk Perception towards HIV/AIDS among Rohingyas in Cox's Bazar, Bangladesh. Journal of Social Behavior and Community Health (JSBCH). 2021; 5(2): 739-749.

### ABSTRACT

**Background:** Rohingyas living in refugee camps of Bangladesh have been identified as a high-risk group for HIV transmission. This study aimed to assess gender differences in risk perception towards HIV/AIDS among Rohingyas in Cox's Bazar.

**Methods:** A cross-sectional design was adopted to assess the level of risk perception towards HIV/AIDS. This analysis utilizes data from a survey of 130 Rohingya people through face-to-face interviews utilizing a 28-item HIV-Knowledge Questionnaire. A systematic sampling technique was used to accomplish data collection survey. Analyzing was done by SPSS 25.

**Results:** Only 41.8% of males and 58.2% of females had a good knowledge score (8 out of 11 items) regarding the transmission of HIV. Knowledge is significantly associated with female gender ( $\chi^2 = 8.927$ ,  $p < 0.005$ ). Gender differences were also significantly associated with the perceived risk of contracting HIV/AIDS in the future ( $p < 0.001$ ). When rank averages were investigated, perceived risk of contracting HIV/AIDS score of the female participants (mean rank = 76.71) appeared to be higher compared to the score of male participants (mean rank = 54.29).

**Conclusion:** Female Rohingyas perceive a higher risk of contracting HIV/AIDS than male Rohingyas. Programs should address harmful gender norms, HIV testing and education emphasizing the risks involved in transactional sex within the camps.

**Keywords:** HIV/AIDS, Gender, Knowledge, Risk, Perception, Rohingya



## Introduction

Conflict-induced displacement has made Rohingya population more vulnerable to HIV transmission. The vulnerability has resulted from a number of factors such as the rate of HIV incidence within the settlement camps, the occurrence of sexual violence in their past locations, the living arrangements within the camps, risk behaviors and limited access to HIV and sexual as well as reproductive health programs (UNHCR/UNAIDS, 2007). A report of UNFPA reveals that approximately 58,300 Rohingya women and girls were sexually abused, and this occurred in a country which continues to display a high incidence of new HIV infections (UNFPA, 2018). Brutal gang rapes in Myanmar left survivors with lots of physical and psychological health complications such as with bleeding vaginal tears, infections and trauma. In Myanmar, rape survivors did not receive any treatment, including access to urgent HIV prophylaxis within 72 hours (Yousuf et al., 2020). UNFPA has taken the lead in supporting survivors of sexual assault and assisted 3500 raped Rohingya victims since late August 2018 (UNFPA, 2018). Other reports show that only 7% of women could manage medical assistance after being subject to sexual violence (Hutchinson, 2018).

The Rohingyas are at great risk due to a number of social, political and contextual factors that directly affect the risk of HIV transmission. Over the decade, rape has been a central phenomenon of the Myanmar military and security forces' genocide campaign against the Rohingya ethnic minority (Dussich, 2018). Rohingya Muslim women and girls have suffered severe sexual violence by powerful men and security forces and have become the victim of rape on many occasions (Masud et al., 2017). Although documentation of the history of gender-based violations against Rohingya women and girls is extensive, there is no information concerning the prevalence of HIV of this group. The threat of HIV to the Rohingya population is not evident from the fact that most of them did not go for HIV screening. Local public health experts believe that HIV infections among

the Rohingyas in Bangladesh have been increasing gradually and the real number of those infected could be much higher than the official figure. Past history of sexual violence, social stigma, gender inequality, risk behavior and lack of awareness are the contributing factors for the spread of the virus (Khan et al., 2021; Toma et al., 2019).

During humanitarian crises, girls and women are particularly vulnerable to HIV contraction and other Sexually Transmitted Infections (STIs) due to a lack of basic living conditions (Islam & Nuzhat, 2018; Hossain et al., 2018; Spiegel, 2007). Current statistics indicate that only 273 HIV-positive cases had been officially recorded within August 2018 among Rohingyas in Bangladesh (Hsan et al., 2019). The rate has been increased to 319 cases as of March 8, 2019, though most of the Rohingyas are undiagnosed. Among the 319 HIV cases, 19 individuals had already died, and 277 others had been under medications (Hsan et al., 2019). Evidence has been produced by Bangladesh government that a total of 395 Rohingya HIV/AIDS patients are now residing in several refugee camps in Cox's Bazar (Chowdhury, 2019).

Anecdotal evidence shows that many Rohingya women are engaging in 'survival sex' as they do not get adequate food in new displaced settlements. They are displaced, desperate, and unsecured due to limited access to income, the breakdown of social structures, loss of family, and reduced health resources (Mahmood et al., 2017). Available data indicate that sex industry is flourishing in the Kutupalong camp - the biggest refugee settlement in Cox's Bazar. Women in refugee camps are often forced to engage in transactional sex for the sake of survival (Ainul et al., 2018). Nearly 500 Rohingya women are selling sex in Kutupalong camp as a means of generating income and as a form of livelihood (Glinski, 2017; Haque, 2018). The poverty-stricken Rohingya women engage in the sex trade to get cash to meet other basic necessities such as food and cloth. The local settlements within the camps have a higher risk of HIV transmission due to high population density,



risk behavior and close connectivity to neighboring areas (Rafe, 2019). To date, Bangladesh hosts almost 900,000 Rohingyas from Myanmar in the Cox's Bazar District, approximately 600,000 of whom are concentrated in the Kutupalong-Balukhali site (Truelove et al., 2020; UNHCR, 2017). A large number of men's relocation to a humanitarian setting (where most people are jobless) contributes to their vulnerability due to disrupted marital and family relationships caused by ethnic cleansing and persecution in Myanmar, and emotional unavailability from the lost partner which may lead to dangerous sexual activities.

Rohingya women are the most vulnerable group experiencing sexual harassment in the refugee camps (Farzana, 2017; Akhter & Kusakabe, 2014). They experience sexual assaults in the camps by camp-authorities, security personnel, and often relatives. In addition, young Rohingya girls face the threat of sexual assaults and rape by powerful local men. HIV-transmission risk increases during violent or forced-sex situations and victims of sexual abuse are particularly vulnerable to HIV infection. Due to conservative religious views and taboos surrounding forced sex, girls and women infrequently talk about their experiences and are most often under-informed about sexuality and the risk of HIV/AIDS transmission. Rohingya women's 'culture of silence' (due to complex relationship between religion and gender) prevents victims from being willing to share information or discuss the act of sexual assault and violation (Ripoll, 2017).

Currently, no data exist on the gender differences in risk perception towards HIV/AIDS among Rohingyas residing in Bangladesh. There is limited information to elucidate gender perspective on risk needed to improve the understanding of women's and men's risk perceptions towards HIV/AIDS in a humanitarian setting. Understanding the differences in perception associated with the vulnerability and susceptibility to HIV among Rohingya population can improve understanding about who is at most risk of HIV transmission and why. Therefore, this study aims

to examine the influence of gender on individual risk perception towards HIV/AIDS among Rohingya people in Cox's Bazar.

## Methods

### *Study design and setting*

A quantitative method was used to address the research objectives. Data were collected from the participants through a cross-sectional survey using a standardized structured questionnaire. Data were collected from two Rohingya camps located at Kutupalong (camp 7) and Hakimpura (camp 14) of Ukhiya Upazila – a sub-district about 30 kilometers away from Cox's Bazar District. Kutupalong refugee camp is one the world's largest refugee camps, inhabited by Rohingyas that fled from ethnic and religious persecution in neighboring Myanmar.

### *Study population and sampling*

The population of this study is the forcefully displaced Myanmar nationals (Rohingyas) who have taken shelter in camp 7 and camp 14 of Ukhiya Upazila of Cox's Bazar District. These two camps are the temporary settlement of non-registered Rohingyas who have taken shelter in Bangladesh in 2017. A systematic sampling procedure was used to recruit the sample from the study population. The sample size was determined using the Cochran sampling formula. However, due to enactment of travel restrictions across all parts of Bangladesh during the COVID-19 pandemic in December 2020, we have managed to recruit only 130 participants. Data were primarily collected from both male and female Rohingyas residing in the two camps. All male and female Rohingyas of selected households (within the selected two camps) between 18–50 years old were eligible respondents.

### *Study instrument and measures*

Face-to-face interviews were used to conduct the survey. The HIV-Knowledge questionnaire was developed after a review of literature (Carey, Morrison & Johnson, 1997). The questionnaire was translated into local language (Bengali) and was administered by trained interviewers who were



fluent speakers of Rohingya language. To establish conceptual equivalency and to make it equally natural and acceptable, forward translations were used. More than 40 questions were set in six sections which included socio-demographic information, knowledge about HIV/AIDS/STDs, socio sexual status of the participants, sexual division of labor and power, risk perception towards HIV/AIDS and issues related to gender-based violence. There were twenty-eight questions to assess knowledge of HIV/AIDS among the participants. Responses to these questions were classified into two categories: 'yes' and 'no'. The correct answer was coded as 1 for each knowledge question whereas the incorrect answer was coded as 0. The overall ratings ranged from 0 to 11, with those scoring an 8 or higher being judged as good knowledge. The fifth section of the questionnaire contains questions regarding risk perception of HIV/AIDS contraction. Participants were asked to answer a four-point Likert scale: 4= very risky, 3= moderately risky, 2= slightly risky, 1= not at all risky. Scores were given according to their responses to perceived risk perception. The aggregate of the participants' responses was used to calculate the score. The value of Cronbach's  $\alpha$  test for the reliability of the questionnaire was 0.72. The internal consistency level was deemed adequate.

#### **Data analysis**

SPSS version 25 was used to enter and analyze the data. Both descriptive and inferential statistics were used to analyze data. The frequencies and percentages were calculated using descriptive statistics. Pearson chi-square tests for independence were used to examine differences in socio-demographic variables and respondents' level of knowledge concerning HIV/AIDS transmission. Significance for the statistical test was set at  $P < 0.05$ . Additionally, Mann-Whitney-U test, a non-parametric test, was performed to assess gender differences in risk perception towards HIV/AIDS transmission.

This study has received ethical approval from the office of the Refugee Relief and Repatriation Commissioner (RRRC) - a government agency under the Ministry of Disaster Management and Relief, which is located in Cox's Bazar, Bangladesh. Verbal informed consent was obtained from all the participants before the interviews. Participants were informed that their participation in this study was voluntary, including the right to withdraw from the interview without any preconditions. In addition, participants were informed clearly in their own language about the aim of the study and that the information they provide during the survey would be kept strictly confidential. For anonymity, no identifying information was collected, with access limited to the principal investigator.

#### **Results**

##### ***Sample demographic characteristics***

The total number of participants was 130, having an equal size from each gender. In terms of selection of respondents from the two camps (camp 7 and camp 14), the number was divided into equal lines (65respondents from each camp). The mean size of family members is 6 (SD = .93). The mean ages of male and female participants were 24.5 (SD = 5.2) and 21.5 (SD = 4.5) years respectively. The majority of the participants were literate (male 67.7% vs. female 64.6%), with 32.3% of males and 35.4% of females not receiving any form of education (illiterate). More than three-quarter (78.5%) of the male participants interviewed in this survey were day laborers, and less than a quarter (18.5%) of this sample reported being a businessman. The majority of the female participants (84.6%) have taken on the bulk of domestic responsibilities as a house wife. A small proportion (male 3.1% vs. female 4.6%) of the sample stated that they have been working for a local NGO inside the camp (Table 1).

##### ***Knowledge on HIV/AIDS by gender***

Analysis of specific individual items concerning knowledge about the mode of HIV transmission revealed some gender differences (Table 2). The



overall knowledge about HIV among the study population was higher in females than in males. Female participants had a statistically higher knowledge score on selected items compared to male participants. Women were more likely than men to agree with the four HIV transmission modes: HIV can be transmitted from mother to child through breastfeeding ( $p < 0.001$ ); use of injecting drugs increases the risk of HIV ( $p < 0.001$ ); having unprotected sex with multiple partners increases the risk of HIV transmission ( $p < 0.001$ ); and condoms can prevent HIV in extramarital relationship ( $p < 0.001$ ).

#### ***Socio-demographic variables and HIV/AIDS knowledge***

The chi-square test for independence was used to determine if there were significant associations between sex and HIV-related knowledge (Table 3). Female participants were more likely than males to report good knowledge about HIV transmission ( $\chi^2 = 8.927$ ,  $p < 0.005$ ). Statistical significance of association between education and HIV knowledge was also found - significantly more literate participants (52.7%) than illiterate (47.3%) reported a good knowledge about HIV/AIDS ( $\chi^2 = 17.649$ ,  $p < 0.001$ ). Moreover, female participants aged 30 years and above were significantly more likely than males to report good knowledge about HIV ( $\chi^2 = 14.292$ ,  $p < 0.005$ ).

#### ***Perceived risk of contracting HIV/AIDS***

Analysis of specific individual items concerning risk perception towards HIV/AIDS revealed a few gender differences (Table 4). Females were more

likely than males to have a higher perceived HIV risk in terms of contracting the virus in the future. The results demonstrated that female Rohingyas (mean rank = 76.71) scored higher on the first item sub-scale than comparison group i.e. male Rohingyas (mean rank = 54.29). The rank value for females was higher (22.42) on average than those of males. Mann-Whitney U value was found to be statistically significant ( $U = 1384.00$ ,  $p < 0.001$ ). Gender differences in risk perception towards engaging in unprotected sex in extramarital relationship were also assessed. The female participants were more likely than the males to report they could get HIV through unprotected sex if they would engage in extramarital relationship (mean rank: 74.50 > 56.50,  $U = 1527.500$ ,  $p < 0.005$ ). Similarly, the perceived vulnerability of contracting HIV among females was higher than those of males (mean rank: 76.23 > 54.77). The Mann-Whitney U test result indicated that the female Rohingyas scored higher on this item than the comparison group (i.e. male Rohingyas). The test value was found to be statistically significant on the third item ( $U = 1415.00$ ,  $p < 0.001$ ). To promote sustained HIV preventive behaviors (such as the use of condom) among Rohingyas, we need to examine their perceived risk of engaging in unprotected sex with regular sexual partners. Gender differences also existed in risk perception towards unprotected sex (not using condoms) with regular sexual partners. Mann-Whitney U value was not found to be statistically significant ( $U = 1779.00$ ,  $p = 0.100$ ) on this item.



**Table 1.** Background characteristics of respondents

Socio-demographic characteristics	Male (n = 65)		Female (n = 65)	
	Number	Percent	Number	Percent
Age (in years)				
<30	31	47.7	29	44.6
≥30	34	52.3	36	55.4
Education				
Illiterate	21	32.3	23	35.4
Literate	44	67.7	42	64.6
Family members				
4	8	12.3	6	9.2
5	23	35.4	17	26.2
6	22	33.8	24	36.9
7	12	18.5	18	27.7
Place of residence				
Camp 7	33	25.38	33	25.38
Camp 14	32	24.61	32	24.61
Occupation				
Day labourer	51	78.5	7	10.8
Small business	12	18.5	-	-
NGO workers	2	3.1	3	4.6
Housewife	-	-	55	84.6
Income (in BDT)				
<2000	17	26.24	53	81.56
2000-5000	20	30.76	5	7.69
5000-8000	14	21.50	3	4.61
8000-11000	9	13.80	2	3.07
11000-14000	5	7.70	2	3.07

Note: 1 US\$ = 86.30 BDT

**Table 2.** Knowledge about HIV/AIDS by gender

Variables/ statements	Gender	Correct answer n (%)	Incorrect answer n (%)	$\chi^2$	P-value
Mosquito bite can spread HIV	Male	21 (32.3)	44 (67.7)	1.605	.205
	Female	28 (43.1)	37 (56.9)		
Sharing the same plate can spread HIV	Male	20 (30.8)	45 (69.2)	0.850	.357
	Female	25 (38.5)	40 (61.5)		
HIV may be spread through touching someone	Male	22 (33.8)	43 (66.2)	6.102	.014
	Female	36 (55.4)	29 (44.6)		
Coughing and sneezing can spread HIV	Male	5 (7.7)	60 (92.3)	8.927	.003
	Female	18 (27.7)	47 (72.3)		
HIV has treatment	Male	27 (41.5)	38 (58.5)	7.924	.004
	Female	43 (66.2)	22 (33.8)		
STI increases the risk of HIV	Male	19 (29.2)	46 (70.8)	1.237	.266
	Female	25 (38.8)	25 (38.8)		
HIV can be transmitted from mother to child through breastfeeding.	Male	23 (35.4)	42 (64.6)	19.271	.000
	Female	7 (10.8)	58 (89.2)		
Injecting drug use increases the risk of HIV	Male	22 (33.8)	43 (66.2)	12.311	.000
	Female	42 (64.6)	23 (35.4)		
HIV can be transmitted through blood	Male	23(35.38)	42 (64.62)	1.154	.283
	Female	29 (44.61)	36 (55.38)		

**Table 2.** Knowledge about HIV/AIDS by gender

Variables/ statements	Gender	Correct answer n (%)	Incorrect answer n (%)	$\chi^2$	P-value
Having multiple sex partners increases the risk of HIV	Male	22 (33.8)	43 (66.2)	16.292	.000
	Female	45 (69.2)	20 (30.8)		
Condoms can prevent HIV/AIDS in extramarital relationship	Male	9 (13.8)	56 (86.2)	18.874	.000
	Female	29 (44.6)	36 (55.4)		

**Table 3.** Comparison of socio-demographic variables and respondents' level of knowledge concerning HIV/AIDS

Variables	Good knowledge n (%)	Poor knowledge n (%)	$\chi^2$	P-value*
<b>Gender</b>				
Male	31 (41.8)	34 (60.7)	8.927	.004
Female	43 (58.2)	22 (39.3)		
<b>Education</b>				
Illiterate	35 (47.3)	7 (12.5)	17.649	.000
Literate	39 (52.7)	49 (87.5)		
<b>Marital status</b>				
Unmarried	31 (48.4)	29 (43.9)	.852	.652
Married	33 (51.6)	37 (56.1)		
<b>Age</b>				
<30	26 (35.1)	27 (48.2)	14.292	.002
≥30	48 (64.9)	29 (51.8)		

Note: A score of 8 and above is classified as good knowledge out of a scale of 11.

\*Significant at  $p < 0.05$ .

**Table 4.** Mann-Whitney-U-test results according to gender differences in risk perception

Statement	Gender	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	P-value
To what degree do you perceive yourself to be at risk of contracting HIV in future?	Male	54.29	3529.00	1384.000	-3.716	.000***
	Female	76.71	4986.00			
To what degree do you perceive yourself to be at risk of contracting HIV if you engage in an extramarital sexual (unprotected) relation?	Male	56.50	3672.50	1527.500	-3.035	.002*
	Female	74.50	4842.50			
To what extent do you perceive yourself to be vulnerable to contracting HIV?	Male	54.77	3560.00	1415.000	-3.520	.000***
	Female	76.23	4955.00			
To what extent do you perceive yourself to be at the risk of contracting HIV if you do not use condom with your regular partner?	Male	60.37	3924.00	1779.000	-1.646	.100
	Female	70.63	4591.00			

\* $p < 0.10$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ . Note: P values based on the Mann Whitney U-test

## Discussion

This study provides greater insights about gender differences in knowledge and risk perception of HIV/AIDS. The study found significant differences among participants' levels of knowledge based on their gender, age, and

educational level. The study showed female Rohingya participants having a higher score of knowledge about the contraction and transmission of HIV/AIDS than their male counterparts ( $p < 0.01$ ). The educational level also has a significant impact on knowledge and risk perception of



contracting HIV/AIDS ( $p < 0.001$ ). This result can be compared with a previous study where Khan et al. (2021) uncovered that women with formal education were 2.37 times more likely to have good knowledge about HIV/AIDS than those without a formal education. This result also ties well with previous studies where education was significantly associated with HIV/AIDS knowledge (Yaya et al., 2016; Haque et al., 2018). Our study revealed that only 58.1% of females had good knowledge regarding the contraction and transmission of HIV/AIDS. The findings are similar to a previous study in which only 30% of the women had a good understanding of HIV transmission modalities while the other 70% had poor knowledge (Khan et al., 2021). In measuring the knowledge about HIV/AIDS, participants were asked questions about the causes and transmission modes of HIV/AIDS. They were asked about their belief regarding mosquito bites, sharing the plate, coughing and sneezing, touching, treatment, and breastfeeding in relation to HIV/AIDS. Misconceptions regarding contraction and transmission of HIV were found in this sample.

In this study, the majority of the female participants believed that HIV transmission cannot occur during breastfeeding. These findings are consistent with a previous research where 98.5% of the participants did not believe that HIV can be transmitted through breastfeeding (Siziya et al., 2008). In this study, over half of the participants believed that HIV could be transmitted by mosquito bite. This finding is consistent with a study where it has been found that 50% of the participants believe a mosquito or other insect bite can transmit HIV (Feresu & Smith, 2013). This result is also supported by another study conducted by Khan et al. (2021) in Bangladesh where the authors found that 20% of Rohingya women believe HIV is transmitted by mosquito bite. More than half of the Rohingyas male (69.2%) and female (61.5%) believed that sharing the plate with an HIV-infected person might transmit HIV. This result is in line with the

previous findings where nearly one quarter (25%) of Rohingyas believed it is possible to become infected with HIV by sharing a plate with someone who is HIV positive (Khan et al., 2021).

A large proportion of female participants were on the belief that condoms must be used in extramarital relationships to prevent HIV/AIDS transmission. Contrary to our results, Lammers et al. (2011) found that males are more knowledgeable about condoms than females. More than half of the male participants identified condoms as a technique to prevent HIV contraction, but only slightly more than a third of women mentioned condoms as a possible preventive tool. Female Rohingyas showed a somewhat higher risk perception towards HIV/AIDS than males. Moreover, females enjoyed better knowledge about the modes of transmission of HIV/AIDS. Apart from that, females carried a somewhat higher risk perception than their male counterparts. In this sample, male Rohingyas were unconcerned about contracting HIV.

The study showed the perceived risk of contracting HIV being low among both genders. The findings of the study are also in agreement with previous research where a majority (59.4%) of the participants did not believe they were at the risk of contracting HIV/AIDS (Singh et al., 2019). Nevertheless, female participants felt to be more vulnerable to contracting HIV/AIDS than male participants. The study found that the average risk of male Rohingyas concerning contracting HIV/AIDS in the future was 54.29 whereas the average female risk was 76.71. As a result, the mean risk of female Rohingya participants was 22.42 times higher than that of male Rohingya participants. The reason behind higher risk perception among females can be related to females' higher knowledge about contraction and transmission of HIV than their male counterparts. The Pearson chi-square test of gender and HIV knowledge shows that female Rohingyas are more likely to have good knowledge about transmission of HIV/AIDS than the males. The findings





contradict previous research suggesting that males are more likely than females to believe they are at high risk of contracting HIV (Singh et al., 2019).

Scores of women have experienced sexual violence in Myanmar and many of them are not screened for HIV and not being aware of their status. This might translate into more HIV/STI infections in the camps. There is a possibility that those women who had not ever been tested for HIV/AIDS were more likely to possess a misconception. Lack of awareness may be a driver in HIV/STI infection among women who are engaged in selling sex in the camp. The findings show that most Rohingya participants in this camp lack reading and writing skills and therefore powerless in terms of accessing written information that could inhibit them from vulnerability to the spread of HIV/AIDS. Due to high illiteracy level in this population group, written information may not be suitable for educating them concerning the disease. Moreover, a large proportion of Rohingyas have substantial misconceptions about risk of HIV transmission which may be a major barrier to HIV prevention. These misconceptions are not limited to illiterate Rohingyas; even the literate participants might have beliefs in various myths about the modes of HIV transmission. The findings of the study project that the risk perception of contracting HIV/AIDS among the Rohingyas is very low. One of the reasons for their low-risk perception could be related to their uncertain living conditions in the camps where they live in overcrowded, unhygienic conditions which are a breeding ground for many infectious diseases.

This study has several limitations that should be considered. The sample size of this study might have been too small to determine the effects of independent variables on outcome variable. It may reduce the power of the study by increasing the margin of error. During our data collection last year, we were compelled to limit the sample size due to COVID-19 pandemic. Travel restrictions were enacted by local authority to follow isolation orders in order to slow the

spread of the virus. Other limitations with the study may be related to under-coverage of the target population. During data collection, under-coverage happened as we failed to include all the target population (from other camps) in the sampling frame. Therefore, certain demographics may have been underrepresented in this sample.

### Conclusion

The main purpose of this study was to investigate effects of gender on the level of HIV/AIDS knowledge and risk perception. In this quantitative study, female participants rated themselves more knowledgeable than the males. However, no significant gender differences were observed in risk perception towards contracting HIV in the context of not using condoms with regular partner. Cautions should be taken while generalizing the findings as it is a cross-sectional study wherein sample size is not sufficiently large to confirm findings.

Findings have revealed that though both male and female participants were knowledgeable on the common modes of transmission of HIV/AIDS, they had many misconceptions regarding sexual practices related to multiple sex partners. Given the high level of misconceptions among Rohingyas specifically males, there is need to develop programs and interventions that equip adult literate and illiterate males with culturally appropriate comprehensive HIV prevention knowledge to reduce transmission. Programs should include HIV testing and education emphasizing the risks involved in transactional sex within the camps. Finally, HIV/AIDS prevention should be considered as a gendered phenomenon especially in Rohingya culture due to its various forms of female subordination.

### Conflict of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

### Acknowledgments

We would like to convey our heartfelt gratitude to all the participants who took part in the survey and took the time to answer the questions.



### Author's contribution

Conceptualization, Sh.E.H.; Methodology, M.S.I.; Formal Analysis, Sh.E.H.; Investigation, M.S.I.; Original Draft, M.S.I.; Review and Editing, Sh.E.H.; Supervision, Sh.E.H. All authors have read and agreed to the published version of the manuscript.

### References

- Ainul, S., Ehsan, I., Haque, E., Amin, S., Rob, U., Melnikas, A., & Falcone, J. (2018). Marriage and sexual and reproductive health of Rohingya adolescents and youth in Bangladesh: A qualitative study. Dhaka: Population Council of Bangladesh. <https://doi.org/10.31899/pgy7.1022>
- Akhter, S., & Kusakabe, K. (2014). Gender-based Violence among Documented Rohingya Refugees in Bangladesh. *Indian Journal of Gender Studies*, 21(2), 225–246. <https://doi.org/10.1177/0971521514525088>
- Carey, M. P., Morrison-Beedy, D., & Johnson, B. T. (1997). The HIV-Knowledge Questionnaire: Development and evaluation of a reliable, valid, and practical self-administered questionnaire. *AIDS and Behavior*, 1, 61–74.
- Chowdhury, O. H. (2019). 319 Rohingyas affected by AIDS. *Ukhiya News*, March 30. Available at <http://en.ukhiyanews.com/by-aids/>
- Dussich, J. P. J. (2018). The Ongoing Genocidal Crisis of the Rohingya Minority in Myanmar. *Journal of Victimology and Victim Justice*, 1(1), 4–24. <https://doi.org/10.1177/2516606918764998>
- Farzana, K. F. (2017). *Memories of Burmese Rohingya Refugees: Contested Identity and Belonging*. New York: Springer.
- Feresu, S., & Smith, L. (2013). Knowledge, attitudes, and beliefs about HIV/AIDS of Sudanese and Bantu Somali immigrant women living in Omaha, Nebraska. *Open Journal of Preventive Medicine*, 03(01), 84–98. <https://doi.org/10.4236/ojpm.2013.31011>
- Glinski, S. (2017). *Clandestine Sex Industry Booms in Rohingya Refugee Camps*. London: Thomson Reuters Foundation. <https://www.globalcitizen.org/en/content/sex-industry-in-rohingya-refugee-camps/?template=next>
- Haque, E. (2018). Socio-Political Impacts of Rohingya Refugees on Bangladesh. Ankara: Migration Policy Center, MPC Report Series.
- Haque, M. A., Hossain, M. S. N., Chowdhury, M. A. B., & Uddin, M. J. (2018). Factors associated with knowledge and awareness of HIV/AIDS among married women in Bangladesh: evidence from a nationally representative survey. *SAHARA-J: Journal of Social Aspects of HIV/AIDS*, 15(1), 121–127. <https://doi.org/10.1080/17290376.2018.1523022>
- Hossain, M. M., Sultana, A., Mazumder, H., & Munzur-E-Murshid. (2018). Sexually transmitted infections among Rohingya refugees in Bangladesh. *The Lancet HIV*, 5(7), e342. [https://doi.org/10.1016/s2352-3018\(18\)30140-1](https://doi.org/10.1016/s2352-3018(18)30140-1)
- Hsan, K., Griffiths, M. D., Gozal, D., & Rahman, M. A. (2019). HIV infection in Rohingya refugees in Bangladesh. *The Lancet HIV*, 6(7), e419. [https://doi.org/10.1016/s2352-3018\(19\)30156-0](https://doi.org/10.1016/s2352-3018(19)30156-0)
- Hutchinson, S. (2018). Gendered insecurity in the Rohingya crisis. *Australian Journal of International Affairs*, 72(1), 1–9. <https://doi.org/10.1080/10357718.2017.1402291>
- Islam, M. M., & Nuzhath, T. (2018). Health risks of Rohingya refugee population in Bangladesh: a call for global attention. *Journal of Global Health*, 8(2). <https://doi.org/10.7189/jogh.08.020309>
- Khan, M. N., Rahman, M. M., Rahman, M. M., & Islam, M. M. (2021). HIV transmission knowledge among Rohingya refugee women in Bangladesh: a cross-sectional survey. *BMJ Open*, 11(10), e047516. <https://doi.org/10.1136/bmjopen-2020-047516>
- Lammers, J., van Wijnbergen, S., & Willebrands, D. (2011). Gender Differences, HIV Risk Perception and Condom Use. Tinbergen Institute Discussion Paper, No. 11-051/2, Tinbergen Institute, Amsterdam and Rotterdam.
- Mahmood, S. S., Wroe, E., Fuller, A., & Leaning, J. (2017). The Rohingya people of Myanmar: health, human rights, and identity. *The Lancet*,



- 389(10081), 1841–1850. [https://doi.org/10.1016/s0140-6736\(16\)00646-2](https://doi.org/10.1016/s0140-6736(16)00646-2)
- Masud, A. A., Ahmed, M. S., Sultana, M. R., Alam, S. I., Kabir, R., Arafat, S. Y., & Papadopoulos, K. (2017). Health Problems and Health Care Seeking Behaviour of Rohingya Refugees. *Journal of Medical Research and Innovation*, 1(1), 21–29. <https://doi.org/10.15419/jmri.27>
- Rafe, R. (2019). HIV, sexual infections rising among Rohingya in Bangladesh. *Deutsche Welle*, December 25. <https://www.dw.com/en/hiv-sexual-infections-rising-among-rohingya-in-bangladesh/a-51793736>
- Ripoll, S. (2017). Social and Cultural Factors Shaping Health and Nutrition, Wellbeing and Protection of the Rohingya within a Humanitarian Context. Institute of Development Studies/ UNICEF. <https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/13328>
- Singh, G., Sewak, A., Reddy, K., & Ram, S. (2019). Gender Differences in HIV Risk Perception and Sexual Behaviour of Young Adults in Metropolitan Areas of Fiji. *The Journal of Pacific Studies*, 39(1), 102-127 [https://doi.org/10.33318/jpacs.2019.39\(1\)-05](https://doi.org/10.33318/jpacs.2019.39(1)-05)
- Siziya, S., Muula, A. S., & Rudatsikira, E. (2008). HIV and AIDS-related knowledge among women in Iraq. *BMC Research Notes*, 1(1), 1-6 <https://doi.org/10.1186/1756-0500-1-123>
- Spiegel P. B., Bennedson, A.R., Claass, J., et al., (2007) Prevalence of HIV infection in conflict-affected and displaced populations in seven sub-Saharan African Countries – a systematic review. *Lancet*, 369(9580), 2187-2195
- Toma, I., Chowdhury, M., Laiju, M., Gora, N., & Padamada, N. (2018). Rohingya refugee response gender analysis: recognizing and responding to gender inequalities. OXFAM, Joint Agency Research Report.
- Truelove, S., Abraham, O., Altare, C., Lauer, S. A., Grantz, K. H., Azman, A. S., & Spiegel, P. (2020). The potential impact of COVID-19 in refugee camps in Bangladesh and beyond: A modeling study. *PLOS Medicine*, 17(6), e1003144. <https://doi.org/10.1371/journal.pmed.1003144>
- UNFPA. (2018). Meeting the critical unique needs of women and girls amid the Rohingya Crisis. Rohingya Humanitarian Response Monthly Situation Report. UNFPA Bangladesh. <http://bangladesh.unfpa.org>
- UNHCR. (2017). UNHCR Bangladesh Operational Update, 10 November 2017. *ReliefWeb*. <https://reliefweb.int/report/bangladesh/unhcr-bangladesh-operational-update-10-november-2017>
- UNHCR/UNAIDS (2007). HIV-related Needs in Internally Displaced Persons and Other Conflict-affected Populations: A Rapid Situation Assessment Tool. Geneva: UNHCR/UNAIDS.
- Yaya, S., Bishwajit, G., Danhouno, G., Shah, V., & Ekholuenetale, M. (2016). Trends and determinants of HIV/AIDS knowledge among women in Bangladesh. *BMC Public Health*, 16(1), 1-9. <https://doi.org/10.1186/s12889-016-3512-0>
- Yousuf, R., Salam, M. M., Akter, S., & Salam, A. (2020). Safety and Security of Sexual-reproductive Health and Gender-based Violence among Rohingya Refugee Women in Bangladesh. *International Journal of Human and Health Sciences (IJHHS)*, 5(2), 163. <https://doi.org/10.31344/ijhhs.v5i2.254>