Check for updates

RESEARCH ARTICLE

Factors associated with awareness about syphilis and gonorrhoea among women in Bangladesh [version 1; peer review: 3 approved with reservations]

Mosharaf Hossain ¹, Rafiqul Islam², Aziza Sultana Rosy Sarkar ³

¹Ministry of Science and Technology, Government of the People's Republic of Bangladesh, Dhaka, 1000, Bangladesh

²Department of Population Science and Human Resource Development, University of Rajshahi, Rajshahi, 6205, Bangladesh

³Department of Statistics, Faculty of Science, Rajshahi College, Rajshahi, 6100, Bangladesh

V1 First published: 31 Mar 2017, 6:406
<https://doi.org/10.12688/f1000research.10982.1>

Latest published: 31 Mar 2017, 6:406
<https://doi.org/10.12688/f1000research.10982.1>

Abstract

Background: Currently, syphilis and gonorrhoea among women is a topic great concern in Bangladesh. To date, little is known in the existing literature regarding its prevalence, and the current level of syphilis and gonorrhoea awareness among women with regard to prevention is inadequate. This research aims to identify factors associated with awareness of syphilis and gonorrhoea among women in Bangladesh. **Methods:** Data were collected from women by the Bangladesh Demographic and Health Survey (BDHS) 2011 as a cross-sectional study. The seven divisions surveyed were Dhaka, Rajshahi, Rangpur, Chittagong, Barisal, Khulna and Sylhet. The number of women in the seven divisions totalled 17,842. The chi-squared test and a logistic regression model were used to determine the social-demographic factors associated with awareness about syphilis and gonorrhoea among women in Bangladesh. **Results:** The rate of awareness about syphilis and gonorrhoea among women in Bangladesh was 13.3% and 15.7%, respectively. The chi-squared test and logistic analysis demonstrated that there is a significant association between the awareness of syphilis and gonorrhoea with the respondents' age, location of the respondents' house, educational level of the respondent, socioeconomic status, geographic region, and respondents that listened to the radio and watched TV. **Conclusions:** There is an essential need to expand the learning and teaching program in Bangladesh regarding syphilis and gonorrhoea, mainly among younger women (<25 years) in all topographical and rural areas. Advertising drives and mass broadcasting programs can be used to increase knowledge within societies, particularly among women. In addition, the low awareness of syphilis and gonorrhoea indicates that prevention interventions are required among women.

Keywords

Syphilis, Gonorrhoea, Knowledge, Awareness, Women.

Open Peer Review

Approval Status

	1	2	3
version 1			
31 Mar 2017	view	view	view

1. **Tasnuva Wahed** , Research to Policy Limited (R2PL), Dhaka, Bangladesh
2. **David H. Martin**, Louisiana State University Health Sciences Center, New Orleans, USA
Tulane University, New Orleans, USA
3. **Jeanne Marrazzo** , University of Alabama at Birmingham School of Medicine, Birmingham, USA

Any reports and responses or comments on the article can be found at the end of the article.

Corresponding author: Mosharaf Hossain (m_population@yahoo.com)

Competing interests: No competing interests were disclosed.

Grant information: The author(s) declared that no grants were involved in supporting this work.

Copyright: © 2017 Hossain M *et al.* This is an open access article distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. Data associated with the article are available under the terms of the [Creative Commons Zero "No rights reserved" data waiver](#) (CC0 1.0 Public domain dedication).

How to cite this article: Hossain M, Islam R and Sarkar ASR. **Factors associated with awareness about syphilis and gonorrhoea among women in Bangladesh [version 1; peer review: 3 approved with reservations]** F1000Research 2017, 6:406 <https://doi.org/10.12688/f1000research.10982.1>

First published: 31 Mar 2017, 6:406 <https://doi.org/10.12688/f1000research.10982.1>

Introduction

Generally, women are in greater danger of contracting sexually transmitted infections compared with men¹. *Treponema pallidum* is a microaerophilic spirochete that causes syphilis, a chronic systemic venereal illness with various characteristics, which is also characterised by latent periods and flare-ups or incidents of energetic virus¹. Gonorrhoea is a general venereal illness caused by the bacterium *Neisseria gonorrhoea*. Symptoms include painful urination and pain around the urethra. Virtually any mucous membrane can be infected^{2,3}. Previous research has shown that the rate of awareness of gonorrhoea was 4%, while that for syphilis was 5% among 1,550 women in Bangladesh⁴, while further research showed that rate of awareness for syphilis and gonorrhoea was 0.9% and 0.5%, respectively⁴. The World Health Organization reported an incidence of 340 million individuals with gonorrhoea and syphilis among 15–49 year olds, the majority of whom resided in Asia⁵. In developed and developing countries, such as Bangladesh, gonorrhoea and syphilis are major health and economic problems⁵. Per day more than 1 million individuals obtain a sexually transmitted infection, and per year, a projected 500 million individuals contract one of four sexually transmitted infections, including gonorrhoea and syphilis⁶.

Geographic region, place of residence, respondent's age, education, listening to the radio and watching television have a sufficient association with knowledge concerning sexually transmitted diseases, in general, among women in Bangladesh⁷. Syphilis and gonorrhoea are harmful to the health of women and infants^{8–10}. Gonorrhoea is caused by pelvic inflammatory diseases, which can lead to sterility, ectopic gravidity, and long-lasting pelvic pain^{11–15,16}. Additionally, investigation specified that syphilis and gonorrhoea combined can be co-factors for HIV infection^{16–19}. In Bangladesh, previous studies have identified the sero-prevalence of sexually transmitted infections and reproductive tract infections in the general population²⁰. However, a nationwide study concerning the rate of awareness of syphilis and gonorrhoea, specifically, among women in Bangladesh is lacking. Consequently, the goal of this study is to identify the associated factors concerning knowledge about these diseases among women in Bangladesh.

Methods

Sample design

This cross-sectional study used data collected in the Bangladesh Demographic and Health Survey (BDHS) 2011, which includes data collected from women. Dhaka, Rajshahi, Rangpur, Chittagong, Khulna, Barisal and Sylhet are seven administrative divisions in Bangladesh. Each division is subdivided into zilas (administrative areas), and each zila into upazilas (sub-administrative areas). Each urban area in an upazila is divided into wards, and into mohallas (villages) within a ward. Each rural area in an upazila is divided into union parishads (UP; local administrative areas) and mouzas (villages) within a UP. These divisions allow the country as a whole to be easily separated into rural and urban areas²¹.

Sampling procedure

The BDHS survey was conducted by a two-stage stratified sample of households. Initially, a total of 600 areas were selected, with 207 clusters in urban areas and 393 in rural areas. A complete household

listing operation was then carried out in all of the selected areas to provide a sampling frame for the second-stage selection of households. In the second stage of sampling, a systematic sample of 30 households on average was selected per area to provide statistically reliable estimates of key demographic and health variables for the country as a whole, for urban and rural areas separately, and for each of the seven divisions. A total of 18,222 ever-married women aged 12–49 were identified in these households, and 17,842 were interviewed, yielding a response rate of 98%²¹.

Data analysis

SPSS v21 was used to conduct statistical analysis. χ^2 tests were used to calculate the association between awareness about syphilis and gonorrhoea and the respondent's age, place of residence, education, socioeconomic grade, geographic region, and if the respondents listen to radio and watch TV. A p-value of 0.05 was considered significant at the 95% confidence intervals (CI) level. To identify the predictive factors with awareness about syphilis and gonorrhoea, and the socio-demographic variables (Table 1), a logistic regression analysis was conducted. The dependent variable used in the model was a dichotomous binary variable: Y=1 if the women have awareness about syphilis and gonorrhoea, and Y=0 otherwise. Respondent's age, place of residence, education, socio-economic grade, geographic region, and if the respondent listens to radio and watch TV were measured as predictive variables (Table 1).

Results

Table 2 presents the association between awareness about syphilis and gonorrhoea and the designated social-demographic variables of women in Bangladesh. The rate of awareness about syphilis

Table 1. Definition and categorisation of potential variables associated with syphilis and gonorrhoea.

Potential variables	Category
Dependent variables	
Awareness about syphilis and gonorrhoea	0=No, 1=Yes
Independent variables	
Respondent's age (years)	1=<25, 2=25–35, 3=36–49
Place of residence	1=Urban, 2=Rural
Educational level	1=No Education, 2=Primary, 3=Secondary & Higher
Socioeconomic status*	1=Poor, 2=Middle & 3=Rich
Geographic region	1=Barisal, 2=Chittagong, 3=Dhaka, 4=Khulna, 5=Rajshahi, 6=Rangpur, 7=Sylhet
Listen to radio	0=No, 1=Yes
Watch TV	0=No, 1=Yes

*Based on BDHS, 2011; <https://dhsprogram.com/pubs/pdf/fr265/fr265.pdf>

Table 2. Awareness about syphilis and gonorrhoea among women stratified by socio-economic and demographic variables as assessed by χ^2 test, using data from the BDHS 2011.

Variables	Syphilis			Gonorrhoea		
	No, n (%)	Yes, n (%)	χ^2	No, n (%)	Yes, n (%)	χ^2
Respondents age (years)						
<25	4971 (91.0)	489 (9.0)	145.00*	4816 (88.2)	644 (11.8)	99.79*
25–35	5735 (86.0)	930 (14.0)		5557 (83.4)	1108 (16.6)	
36–49	4770 (83.4)	947 (16.6)		4662 (81.5)	1055 (18.5)	
Place of residence						
Urban	5066 (81.8)	1130 (18.2)	204.40*	4933 (79.6)	1263 (20.4)	154.92*
Rural	10410 (89.4)	1236 (10.6)		10102 (86.7)	1544 (13.3)	
Educational level						
No education	4301 (92.7)	338 (7.3)	412.10*	4254 (91.7)	385 (8.3)	552.17*
Primary	4795 (89.9)	537 (10.1)		4704 (88.2)	628 (11.8)	
Secondary & Higher	6380 (81.1)	1491 (18.9)		6077 (77.2)	1794 (22.8)	
Socioeconomic status						
Poor	5932 (92.1)	509 (7.9)	330.36*	5791 (89.9)	650 (10.1)	332.40*
Middle	3017 (88.0)	411 (12.0)		2949 (86.0)	479 (14.0)	
Rich	6527 (81.9)	1446 (18.1)		6295 (79.0)	1678 (21.0)	
Geographic region						
Barisal	1643 (79.5)	423 (20.5)	148.10*	1543 (74.7)	523 (25.3)	204.10*
Chittagong	2503 (87.2)	368 (12.8)		2466 (85.6)	405 (14.1)	
Dhaka	2633 (85.4)	451 (14.6)		2562 (83.1)	522 (16.9)	
Khulna	2288 (86.1)	368 (13.9)		2210 (83.2)	446 (16.8)	
Rajshahi	2324 (89.1)	284 (10.9)		2267 (86.9)	341 (13.1)	
Rangpur	2230 (90.3)	239 (9.7)		2157 (87.4)	312 (12.6)	
Sylhet	1855 (88.8)	233 (11.2)		1830 (87.6)	255 (11.4)	
Listen to radio						
No	14263 (87.1)	2109 (12.9)	24.83*	13862 (84.7)	2510 (15.3)	24.16*
Yes	1213 (82.3)	257 (17.5)		1173 (79.8)	297 (20.2)	
Watch TV						
No	9293 (90.0)	1029 (10.0)	230.72*	9052 (87.7)	1270 (12.3)	217.17*
Yes	6183 (82.2)	1337 (17.8)		5982 (79.6)	1537 (20.4)	
Rate of awareness						
Syphilis	13.3					
Gonorrhoea	15.7					

*p<0.05 level of significance

and gonorrhoea among women in Bangladesh was 13.3% and 15.7%, respectively. Women who were <25 years, 25–35 years and 36–49 years had an awareness of 9.0%, 14.0%, 16.6% for syphilis, respectively, and 11.8%, 16.6%, 18.5% for gonorrhoea, respectively. Among all the women, 10.6% and 13.3% in rural areas and 18.2% and 20.4% in urban areas had awareness about syphilis and gonorrhoea in Bangladesh, respectively. Only 18.9% and 22.8% of women that were educated at a secondary or higher level had awareness about syphilis and gonorrhoea, respectively, and 18.1% and 21.0% rich women knew about syphilis and awareness, respectively. The women in the Barisal division had the highest (20.5% and 25.3%) awareness about syphilis and gonorrhoea of all the geographic regions (12.8% and 14.1%, Chittagong; 14.6% and 16.9%, Dhaka; 13.9% and 16.8%, Khulna; 10.9% and 13.1%, Rajshahi; 9.7% and 12.6%, Rangpur; 11.2% and 11.4%, Sylhet). Of

the women who listen to radio only 17.5% and 20.2% knew about syphilis and gonorrhoea, respectively, and of those who watch TV only 17.8% and 20.4% had awareness.

From Table 3, women aged 25–35 years and 36–49 years were, respectively, 1.91 and 3.01, and 1.77 and 2.63 times more aware of syphilis and gonorrhoea, respectively, compared to women aged <25 years. Women that lived in rural areas had 0.72 and 0.82 times less awareness about syphilis and gonorrhoea, respectively, than women living in urban areas in Bangladesh. Education was shown to be an important factor for awareness about syphilis and gonorrhoea among women: Women who had finished primary, secondary and higher teaching were, respectively, 1.56, 3.41, and 1.59, and 3.72 times more aware of syphilis and gonorrhoea than women who had no education. The level of awareness about syphilis and gon-

Table 3. Predictive factors concerning awareness about syphilis and gonorrhoea among women stratified by socio-economic and demographic variables, using data from the BDHS 2011.

Variables	Syphilis		Gonorrhoea	
	Adjusted Odds Ratios	95%CI	Adjusted Odds Ratios	95%CI
Respondents age (years)				
<25	1.00	.....	1.00	.....
25–35	1.91*	1.69–2.15	1.77*	1.59–1.97
36–49	3.01*	2.65–3.43	2.63*	2.34–2.97
Place of residence				
Urban	1.00	.....	1.00	.....
Rural	0.72*	0.65–0.80	0.82*	0.74–0.90
Educational level				
No education	1.00	.....	1.00	.....
Primary	1.56*	1.34–1.80	1.59*	1.38–1.82
Secondary & Higher	3.41*	2.95–3.94	3.72*	3.25–4.26
Socioeconomic status				
Poor	1.00	.....	1.00	.....
Middle	1.17*	1.01–1.35	1.06	0.92–1.20
Rich	1.23*	1.06–1.44	1.22*	1.06–1.41
Geographic region				
Barisal	1.00	.....	1.00	.....
Chittagong	0.56*	0.48–0.66	0.47*	0.40–0.55
Dhaka	0.65*	0.55–0.76	0.59*	0.51–0.69
Khulna	0.59*	0.50–0.70	0.56*	0.48–0.65
Rajshahi	0.48*	0.40–0.57	0.45*	0.38–0.52
Rangpur	0.48*	0.40–0.58	0.49*	0.42–0.58
Sylhet	0.52*	0.44–0.63	0.45*	0.37–0.53
Listen to radio				
No	1.00	.....	1.00	.....
Yes	1.17*	1.01–1.36	1.13*	1.05–1.29
Watch TV				
No	1.00	.....	1.00	.....
Yes	1.01*	1.01–1.29	1.11*	1.04–1.25
Model Summary				
Model Chi-Square	1034.5		1139.22	
P value	0.001		0.001	
2 Log likelihood	12929.17		14390.75	
Cox & Snell R ²	0.16		0.16	
Nagelkerke R ²	0.21		0.19	
Overall percentage	86.7		89.0	

*p<0.05 level of significance

gonorrhoea increased with the level of women's education. The middle class and rich women were, respectively, 1.17 and 1.23, and 1.06 and 1.22 times more aware of syphilis and gonorrhoea than poor women. In addition, women living in Dhaka, Khulna, Chittagong, Rajshahi, Rangpur and Sylhet divisions had less awareness about syphilis and gonorrhoea than women living in the Barisal division. Women who listen to radio and watch TV were, respectively, 1.17 and 1.01, and 1.13 and 1.11 times more aware of syphilis and gonorrhoea, respectively, compared to women who did not listen to radio or watch TV in Bangladesh.

Discussion

Awareness about syphilis and gonorrhoea leads to the promotion of health care among women in Bangladesh. The present study was designed to identify the awareness about syphilis and gonorrhoea among women. In this study, the rate of awareness about syphilis and gonorrhoea among women in Bangladesh is 13.3% and 15.7%, respectively. Bangladesh in previous studies shows that, the rate of awareness about syphilis and gonorrhoea is between 4–5.7% and 5–6.3% respectively^{4,16}. The Bangladesh government should give urgent attention to increase awareness about the rate of syphilis

and gonorrhoea in Bangladesh, since syphilis and gonorrhoea can lead to ectopic pregnancy, low birth weight, pelvic inflammatory diseases and infertility, which are increasing day-by-day¹⁶. Older women have a higher level of awareness about syphilis and gonorrhoea, since they have acquired knowledge related to sexuality and reproduction²². In this study, middle-aged and older women have better awareness about syphilis and gonorrhoea compared to younger women (<25 years). The old-style society system and health service overlook younger women in Bangladesh. The level of women's education is significantly associated with awareness about syphilis and gonorrhoea. Education makes an important contribution to awareness, and it showed a statistically significant association with awareness in the current study ($p < 0.001$). A higher level education provides women with various opportunities, such as practice of health scare and knowledge on reproductive health. This is supported by the encouraging effect of teaching for the development of awareness about syphilis and gonorrhoea seen in previous studies^{23,24}. In this study, women that live in urban areas have more awareness about syphilis and gonorrhoea, as do women in the Barisal (urban) area. Urban areas are exposed more to mass media and education programs compared with rural areas. Mass media is an important channel, as music, newspapers, songs and advertising can communicate awareness about syphilis and gonorrhoea. The major sources of information about syphilis and gonorrhoea for women are the radio and TV, and in the present study women that listened to the radio and watched TV were more likely to know about the two STIs. This is similar to the suggestion established by Khan and Goel in their research: The level of awareness increased with age and literacy, which shows policymakers that educational intervention programs may be effective^{23,25}. One of the limitations of this research is that the material was self-reported and few studies have studied syphilis and gonorrhoea in Bangladesh. Therefore, Bangladesh needs more research about these diseases.

Conclusions

Knowledge about infectious diseases, especially syphilis and gonorrhoea, in Bangladesh has been an important theme in population based studies. Educating women is an important step in increasing knowledge consciousness about syphilis and gonorrhoea. Highly effective sexual health education should be included in textbooks and infectious diseases prevention programmes, which will achieve positive health outcomes among rural poor women of Bangladesh. At present, awareness about syphilis and

gonorrhoea shows there is more risk to women in different regions (Rajshahi, Rangpur, Sylhet and Chittagong divisions). Rural school based educational programmes are needed to increase the awareness about syphilis and gonorrhoea. However, mass media (broadcasting and television) play a large role in increasing awareness about infectious diseases, such as syphilis and gonorrhoea. Therefore, Bangladeshi government policy should focus on increasing educational programmes at the public level about syphilis and gonorrhoea through the use of radio, television, the Internet, newspapers and textbooks.

Ethical approval

Ethical approval for this study was not applicable, since ethical approval for the collection of data was previously approved for BDHS.

Data availability

The data from BDHS 2011 are free-to-access (https://dhsprogram.com/data/dataset/Bangladesh_Standard-DHS_2011.cfm?flag=0); however, before you can download data, users must register as a DHS data user. Dataset access is only granted for legitimate research purposes (<https://dhsprogram.com/data/new-user-registration.cfm>).

Author contributions

MH and ASRS participated in the design of the study and performed the statistical analysis. MRI conceived the study, and participated in its design and coordination and helped to draft the manuscript. All authors read and approved the final manuscript.

Competing interests

No competing interests were disclosed.

Grant information

The author(s) declared that no grants were involved in supporting this work.

Acknowledgments

The authors wish to acknowledge the BDHS, NIPORT, MEASURE DHS and ICF for data collection. The authors are particularly grateful for the professional work undertaken by BDHS, without which this work would not have been possible.

References

- Farah A, Rahman MH, Rahman O, *et al.*: **Socio demographic study of gonorrhoea and syphilis in two medical college hospital and two private chamber in Bangladesh.** *Med Today*. 2013; 25(1): 18–20.
[Publisher Full Text](#)
- Cox DL, Chang P, McDowall AW, *et al.*: **The outer membrane, not a coat of host proteins, limits antigenicity of virulent *Treponema pallidum*.** *Infect Immun*. 1992; 60(3): 1076–83.
[PubMed Abstract](#) | [Free Full Text](#)
- Wolff K: **Fitzpatrick's Dermatology in General Medicine.** Seventh edition. *Mc Graw Hill Medical*. 2008; 2: 11993–6.
[Reference Source](#)
- Khan MA, Rahman M, Khanam PA, *et al.*: **Awareness of sexually transmitted**

- disease among women and service providers in rural Bangladesh. *Int J STD AIDS*. 1997; **8**(11): 688–96.
[PubMed Abstract](#) | [Publisher Full Text](#)
5. World Health Organization: **Global prevalence and incidence of selected curable sexually transmitted infections: overviews and estimates**. Geneva, Switzerland, 2001.
[Reference Source](#)
 6. WHO: **Fact sheet: Sexually transmitted infections (STIs)**. World Health Organization. Geneva, Switzerland, 2013.
[Reference Source](#)
 7. Hossain M, Mani KK, Sidik SM, *et al.*: **Knowledge and awareness about STDs among women in Bangladesh**. *BMC Public Health*. 2014; **14**: 775.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
 8. Cotch MF, Pastorek JG 2nd, Nugent RP, *et al.*: **Trichomonas vaginalis associated with low birth weight and preterm delivery. The Vaginal Infections and Prematurity Study Group**. *Sex Transm Dis*. 1997; **24**(6): 353–60.
[PubMed Abstract](#) | [Publisher Full Text](#)
 9. Goldenberg RL, Thom E, Moawad AH, *et al.*: **The preterm prediction study: fetal fibronectin, bacterial vaginosis, and peripartum infection. NICHD Maternal Fetal Medicine Units Network**. *Obstet Gynecol*. 1996; **87**(5 Pt 1): 656–60.
[PubMed Abstract](#) | [Publisher Full Text](#)
 10. Newton ER, Piper J, Peairs W: **Bacterial vaginosis and intraamniotic infection**. *Am J Obstet Gynecol*. 1997; **176**(3): 672–7.
[PubMed Abstract](#) | [Publisher Full Text](#)
 11. Weström L: **Effect of acute pelvic inflammatory disease on fertility**. *Am J Obstet Gynecol*. 1975; **121**(5): 707–13.
[PubMed Abstract](#) | [Publisher Full Text](#)
 12. Holmes KK, Eschenbach DA, Knapp JS: **Salpingitis: overview of etiology and epidemiology**. *Am J Obstet Gynecol*. 1980; **138**(7 Pt 2): 893–900.
[PubMed Abstract](#) | [Publisher Full Text](#)
 13. Brunham RC, Binns B, Guijon F, *et al.*: **Etiology and outcome of acute pelvic inflammatory disease**. *J Infect Dis*. 1988; **158**(3): 510–7.
[PubMed Abstract](#) | [Publisher Full Text](#)
 14. Cates W Jr, Rolfs RT Jr, Aral SO: **Sexually transmitted diseases, pelvic inflammatory disease and infertility: an epidemiologic update**. *Epidemiol Rev*. 1990; **12**: 199–220.
[PubMed Abstract](#)
 15. World Health Organization: **Tubal infertility: serologic relationship to past chlamydial and gonococcal infection**. World Health Organization Task Force on the Prevention and Management of Infertility. *Sex Transm Dis*. 1995; **22**: 71–7.
[PubMed Abstract](#)
 16. Gibney L, Macaluso M, Kirk K, *et al.*: **Prevalence of infectious diseases in Bangladeshi women living adjacent to a truck stand: HIV/STD/hepatitis/genital tract infections**. *Sex Transm Inf*. 2001; **77**(5): 344–350.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
 17. Wasserheit JN: **Epidemiological synergy. Interrelationships between human immunodeficiency virus infection and other sexually transmitted diseases**. *Sex Transm Dis*. 1992; **19**(2): 61–77.
[PubMed Abstract](#) | [Publisher Full Text](#)
 18. Laga M, Nzila N, Goeman J: **The interrelationship of sexually transmitted diseases and HIV infection: implications for the control of both epidemics in Africa**. *AIDS*. 1991; **5**(Suppl 1): S55–63.
[PubMed Abstract](#)
 19. Cohen CR, Duerr A, Pruthithada N, *et al.*: **Bacterial vaginosis and HIV seroprevalence among female commercial sex workers in Chiang Mai, Thailand**. *AIDS*. 1995; **9**(9): 1093–7.
[PubMed Abstract](#)
 20. Gani MS, Chowdhury AM, Nyström L: **Urban–rural and socioeconomic variations in lifetime prevalence of symptoms of sexually transmitted infections among Bangladeshi adolescents**. *Asia Pacific Family Medicine*. 2014; **13**: 7.
[Publisher Full Text](#)
 21. National Institute of Population Research and Training (NIPORT): **Bangladesh Demographic and Health Survey 2011**. Mitra and Associates, and ICF International, 2013. Dhaka, Bangladesh and Calverton, Maryland, USA: NIPORT, Mitra and Associates, and ICF International. Dhaka, Bangladesh, 2013.
[Reference Source](#)
 22. Khan MA: **Knowledge on AIDS among female adolescents in Bangladesh: evidence from the Bangladesh demographic and health survey data**. *J Health Popul Nutr*. 2002; **20**(2): 130–137.
[PubMed Abstract](#)
 23. Jahan M: **Women workers in Bangladesh garments industry: a study of the work environment**. *Int J Soc Sci Tomorrow*. 2012; **1**(3): 1–5.
 24. Mondal NI, Hossain M, Rahman M: **Knowledge and awareness about HIV/AIDS among garments workers in Gazipur District Bangladesh**. *Soc Sci*. 2008; **3**(7): 528–530.
[Reference Source](#)
 25. Goel NP, Pandey MC: **Awareness on AIDS & drug among college students in colleges of Meghalaya**. *Int Educ*. 1997; **12**(1): 1–6.

Open Peer Review

Current Peer Review Status: ? ? ?

Version 1

Reviewer Report 25 September 2017

<https://doi.org/10.5256/f1000research.11840.r25480>

© 2017 Marrazzo J. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Jeanne Marrazzo

Division of Infectious Diseases, University of Alabama at Birmingham School of Medicine, Birmingham, AL, USA

There is so little information on awareness of common STIs in countries like Bangladesh that it is great to see that the authors included syphilis and gonorrhea in their assessment here. The study is strengthened by the nature of the survey which appears to be a nationally representative household sample (albeit from 2011, but that is OK given how little data we have from this region on this topic). My major question is about the conduct of the interviews themselves, especially given that I suspect a lack of privacy might have been one challenge, especially for women who might not have had much autonomy in some households (this may be presumptuous of me, so I would welcome the authors' provision of details). How were the women approached? Was a standard interview format used? Were the interviewers male? Was there any effort to match interviewers by sex? These are important considerations if we are to judge the results as representative and significant, and we need to know more about the methodology in general.

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?

No

If applicable, is the statistical analysis and its interpretation appropriate?

Partly

Are all the source data underlying the results available to ensure full reproducibility?

No

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Reviewer Report 18 September 2017

<https://doi.org/10.5256/f1000research.11840.r25479>

© 2017 Martin D. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

David H. Martin

¹ School of Medicine, Louisiana State University Health Sciences Center, New Orleans, LA, 70112, USA

² School of Public Health, Tulane University, New Orleans, LA, USA

I agree for the most part with the points made by the other reviewer of this paper. Here I will not repeat any of the points previously made but I have several to add which I think the authors and readers should consider.

Introduction

1st paragraph. One of the most common symptoms of gonorrhea in males, urethral discharge, was not mentioned.

2nd paragraph. The following statement is incorrect: "Gonorrhea is caused by pelvic inflammatory diseases,..." I think the authors meant to say "Gonorrhea causes pelvic inflammatory disease which can lead to sterility..." This is a typographical error which significantly changed the meaning of a sentence. There are other less significant such errors throughout the paper and, as recommend by the other reviewer, the paper would benefit from proofreading to detect and correct these.

Background information on the national prevalence rates of syphilis and gonorrhea would be helpful in understanding the results of the study. Are such data available? If so they should be provided in the introduction.

Results

It is striking that all the independent variables tested were independently associated with level of knowledge about syphilis and gonorrhea despite the fact there must be significant confounding of the analysis i.e., for example, socioeconomic status is always strongly correlated with educational level. This correlation is so strong it is somewhat surprising that both variables were independently associated knowledge levels. The large sample size probably accounts for this and

this the major strength of the paper.

Discussion

It was striking that the Barisal region had significantly higher knowledge levels than the other districts. From what I could learn on the internet, this is a relatively rural area which, based on the results of the comparison of rural vs. urban area knowledge levels, should have had lower knowledge levels. Dhaka is the largest city in Bangladesh yet knowledge levels in the Dhaka region were significantly lower than in the Barisal region. It would be important for the authors to help the reader understand this unexpected finding in the Discussion Section of the paper. If there are better sexual health education programs in Barisal, perhaps these could be adapted in other parts of the country.

The statement concerning the importance of mass media that songs can communicate awareness of syphilis and gonorrhea struck me. Is this really true in Bangladesh? If so, it would be novel and it would be interesting to know more songs used for sexually transmitted infection (STI) education.

Conclusions

Four geographic regions were singled out as parts of Bangladesh with the lowest knowledge of syphilis and gonorrhea. However, it does not appear that there is much difference between these four regions and the Dhaka and Khulna regions. Only the Barisol region seems to have be better knowledge of these two STIs than any of the other regions.

The main message of the paper is clear as stated in the concluding sentence. Much greater knowledge of STIs is needed throughout all of Bangladesh regardless of socioeconomic status and educational level. This will be a daunting task given the relatively low levels of access to mass media in the country.

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

I cannot comment. A qualified statistician is required.

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Sexually transmitted infections

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Reviewer Report 11 September 2017

<https://doi.org/10.5256/f1000research.11840.r25690>

© 2017 Wahed T. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Tasnuva Wahed

Founder & Managing Director, Research to Policy Limited (R2PL), Dhaka, Bangladesh

This article provides updated information on awareness level of Bangladeshi women on two important sexually transmitted diseases, syphilis and gonorrhea including associated factors with the awareness level. It has been prepared based on national survey called Bangladesh Demographic and Health Survey (BDHS) 2011. Therefore, data used in this article is valid and widely acceptable. However, I have few suggestions and some clarity for better readability and understanding of the readers.

1. Abstract:

The authors mentioned, "To date, little is known in the existing literature regarding its prevalence, and the current level of syphilis and gonorrhea awareness among women with regard to prevention is inadequate." It is not clear whether there is lacking of information on prevalence of syphilis and gonorrhea or prevalence of awareness level on syphilis and gonorrhea. The authors did not measure the prevalence of syphilis and gonorrhea in this study. Please, clarify or revise this sentence.

2. Introduction

- The author should include some information on why Bangladeshi women are at risk of syphilis and gonorrhoea.
- Last sentence of first paragraph in Introduction section: "Per day more than 1 million individuals obtain a sexually transmitted infection, and per year, a projected 500 million individuals contract one of four sexually transmitted infections, including gonorrhoea and syphilis"- Are these infected individuals from Bangladesh or from the world population? Please also use a reference.

3. Methods:

- Sample design (Page 3):
 - I would prefer to use "Study design and study site" instead of sample design.

- Did authors collect primary data using cross-sectional study design or secondary data review or analysis was applied, please clarify?
- Sampling procedure:
 - What is a cluster, or how have these clusters been defined or created?
 - If description of this sampling procedure is published in a BDHS report, it can be used here as a reference.
- If this is not secondary data analysis or it involves primary data collection, description of field visits is required.
- Description of questionnaire is required.
- Data analysis: The definition of “awareness about syphilis and gonorrhea” is required. The authors may include a specific or list of questions used to define or identity “awareness about syphilis and gonorrhea” as an example.
- Table 1: Did the authors mean the first category “1≤25” as “12-24” years? How many under 18 children were in this group? I would suggest to make two groups by stratifying first category as 12-17 as adolescent and 18-24 as youth. There should be a significant awareness difference between adolescents and youth groups.

4. Results:

- Table 2: It should indicate total 'n' for Syphilis and total 'n' for Gonorrhoea in the Heading as it is not cited in the Method section.
- Table 3:
 - Place of residence: It has been interpreted as “Women that lived in rural areas had 0.72 and 0.82 times less awareness about syphilis and gonorrhoea, respectively, than women living in urban areas in Bangladesh (Column: Right, Paragraph:2, Line:4)”- I would suggest to check this interpretation by a statistician.
 - Geographic region: The author should include a justification in the Method's data analysis paragraph why they used Barisal as a reference category. In my opinion, Dhaka can be a reference category as it is capital city of Bangladesh.

5. Discussion:

- The authors justified with possible reasons about their findings.
- In first paragraph, the authors described the level of awareness separately at now and in the past. I would suggest to show this information in one sentence as, “Over one and a half decades (from 1997-2001 to 2011), the awareness on syphilis and gonorrhoea has been slightly/poorly/unsatisfactory increased from 4–5.7% to 13.3% and 5–6.3% to 15.7% respectively (ref).”

6. Grammatical or Typo-errors:

The whole manuscripts should be checked by an English editor as a few typo-errors have been observed. Such as:

- Abstract: "Currently, syphilis and gonorrhoea among women is a topic great concern in Bangladesh. To date, little is known in the existing literature regarding its prevalence, and the current level of syphilis and gonorrhea awareness among women with regard to prevention is inadequate (Page 1)." The authors may want to write: Currently, syphilis and gonorrhoea among women is a topic **of** great concern in Bangladesh.
- Methods: "This cross-sectional study used data collected in the Bangladesh Demographic and Health Survey (BDHS) 2011, which includes data collected from women (Page-3)." The use of word 'collected' twice makes the sentence unclear.
- Discussion: "A higher level education provides women with various opportunities, such as practice of health scare and knowledge on reproductive health (Page-6)." The author may write **care** instead of scare.

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

Partly

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Sexual and Reproductive Health, Cholera and Oral Cholera Vaccine

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

The benefits of publishing with F1000Research:

- Your article is published within days, with no editorial bias
- You can publish traditional articles, null/negative results, case reports, data notes and more
- The peer review process is transparent and collaborative
- Your article is indexed in PubMed after passing peer review
- Dedicated customer support at every stage

For pre-submission enquiries, contact research@f1000.com

F1000Research