

FACTORS OF SEXUALLY TRANSMITTED INFECTION SYMPTOMS AMONG WOMEN IN INDONESIA: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Sexually transmitted infections (STIs) are illnesses that spread from person to person through sexual activity. In Indonesia, STI cases increased between 2016 and 2017. One of the high cases reported in North Sumatra with 1,183 STIs cases which ranked seventh in Indonesia and second on Sumatera Island. **Purpose:** This study aimed to analyze the risk factors related to women with STIs symptoms in North Sumatra. **Methods:** A cross-sectional study was conducted using the 2017 Indonesian Demographic Health Survey data which included a total sample of 2,440 women aged 15-49 years domicile in North Sumatra. Then, using IBM SPSS 25 to perform a multivariate analysis utilizing logistic regression. **Results:** This study showed that women with a genital ulcer were associated with living in rural areas (OR: 2.68, 95% CI: 1.67-4.31), poor economic status (OR: 1.47, 95% CI: 0.94-2.29), and the spouse having other sex partners (OR: 0.54, 95% CI: 0.31-0.94). Moreover, women who lived in rural areas (OR: 1.74, 95% CI: 1.38-2.20), had poor economic status (OR: 1.33, 95% CI: 1.05-1.68), and their spouse has STIs (OR: 0.51, 95% CI: 0.39-0.66) were associated with vaginal discharge. **Conclusion:** Findings indicated that STIs symptoms were higher among women who lived in rural areas with poor economic status and had negative attitudes toward negotiating safe sex with partners. It is advised that intervention programs focus more on conducting mass STIs testing and safe sex campaign in rural areas.

Keywords: sexual behavior, sexual transmitted diseases, socioeconomic factors

INTRODUCTION

Sexually Transmitted Infections (STIs) are critical global health issues transmitted through vaginal, anal, or oral sex. Common STIs such as chlamydia, gonorrhea, syphilis, and trichomoniasis are curable, while hepatitis B, herpes simplex virus, HIV, and HPV remain incurable (WHO, 2022). Despite significant global efforts, STIs continue to pose a serious threat, with over one million new cases reported daily (WHO, 2022).

In Indonesia, the sexually transmitted infections burden is substantial, with 30,679 cases reported in the fourth quarter of 2017. High-risk groups, including sex workers, individuals with multiple sexual partners, and those with a history of STIs, are particularly affected. North Sumatra, with 1,183 STI infections, ranks as a significant hotspot, particularly concerning given that 7% of pregnant women in the region tested positive for syphilis in 2017 males (Zhong *et al.*, 2022). This regional data underscores the critical need for effective sexually transmitted infections screening and intervention strategies

Current sexually transmitted infections research often overlooks the nuanced factors influencing infection rates, such as personal attitudes and behaviors. While technical aspects of sexually transmitted infections management are well-documented, there is a notable gap in understanding how individual characteristics, such as socioeconomic status and educational background, affect Sexually transmitted infections risk. Economic factors and risky behaviors, including substance abuse and unsafe sexual practices, are known contributors to STI prevalence (Berry & Johnson, 2018; Gwon *et al.*, 2016; Wakgari *et al.*, 2020). However, few studies have integrated these variables with personal attitudes towards sexual activity.

This study seeks to address this gap by focusing on North Sumatra, a region with limited research on sexually transmitted infections risk factors and a significant incidence of STI-related diseases. The Indonesian Demographic and Health Survey (IDHS) provides robust data for this investigation, given its nationwide scope and collaboration with key health organizations. The novel aspect of this research lies in its approach to linking individual behaviors and

attitudes with Sexually Transmitted Infections risk, specifically targeting women in North Sumatra—a region with pressing health concerns and limited existing literature on sexually transmitted infections determinants.

The urgency of this study is underscored by the rising prevalence of STI-related diseases, with an estimated 8 million cases projected by 2022, including significant increases in gonorrhea, hepatitis B and C, and HIV (WHO, 2022). Given the high incidence and the critical lack of targeted research in North Sumatra, this study will contribute valuable insights into the specific risk factors and attitudes influencing STI rates in the region. (Askhori *et al.*, 2021; Farshbaf-Khalili *et al.*, 2014; McClure *et al.*, 2018; Muntyanu *et al.*, 2022).

The aim of this study is to analyze the relationship between individual characteristics and attitudes towards sexual activity with the prevalence of STI symptoms among women in North Sumatra. By examining these factors, the study aims to identify specific risk factors and behavioral patterns that contribute to sexually transmitted infections rates, thereby informing more effective prevention and intervention strategies tailored to the region.

METHOD

Data source and design

This cross-sectional study used the secondary data obtained from the 2017 Indonesian Demographic and Health Survey (IDHS). To create the IDHS model data, specific questions or parts as well as statistics comparable to Indonesia were considered. The models were examined and updated based on applicable country-specific surveys; they were intended to be adopted but might be discarded if they were not applicable to a particular nation. Generally, surveys are conducted over a period of 18 to 12 months. For specific indicators, IDHS data were collected nationally in collaboration with the National Population and Family Planning Board (BKKBN), Statistic Indonesia (BPS), and the Ministry of Health. It included a population of 2,459 households, and 2,440 household datasets were chosen for analysis after the data were cleaned for missing and unnecessary data. Women aged 15–49 years who lived in North Sumatra, either rural or urban areas, and completed the questionnaire on the variables needed for this study were

chosen as the criteria. Written permission to access the IDHS database was obtained through the DHS program website and email. The selected variable examined in this research also considered the availability of the dataset.

Independent Variables

This study employed six explanatory variables divided into two variable groups; Socio-demographic Variables included (1) Area of Living classified as "Rural" and "Urban," (2) Literacy. "Cannot read at all," "Able to read only part of the sentence," Blind/visually impaired" were classified as "Low," "meanwhile "Able to read a whole sentence" was classified as "High," (3) Economic Status. Variables such as "Poorest" and "Poorer" were classified as "Poor", Meanwhile "Middle", "Richer", and "Richest" were classified as "Rich", and (4) Educational Level. Those who have primary, secondary, and higher education were classified as "High" and those who don't as "Low." Attitude Variables associated with women refusing sex with their spouse, such as (5) Refusing Sex If Spouse Has STIs, and (6) Refusing Sex If Spouse Has Other Women. Both attitude variables were classified as "No" or "Yes," with "Don't Know" responses classified as "No."

Dependent Variables

The study employed two IDHS variables to assess STI symptoms in women: (1) genital sore/ulcer within the last 12 months and (2) vaginal discharge in the last 12 months. Each

response was binary, with either a "No" or "Yes" response. "Don't Know" responses were treated as "No" in this study.

Data Analysis

All IDHS data were analyzed using IBM SPSS version 25 for statistical analysis. The dataset was thoroughly inspected for missing values that needed to be excluded from analysis. Univariate, bivariate, and multivariate analyses were performed. The continuity correction test was used to investigate independent variables at the bivariate level, and variables with values greater than 0.25 were determined to be investigated at the multivariate level. In this study, the "having vaginal sore/ulcer" variable included the place of living, economic level, education level, and "husband has other women", while the "Having Genital Discharge" variable" included the same with the addition of the literacy variable. The odds ratios (OR) of the independent and outcome variables in the study were calculated using logistic regression in multivariate analysis. The results were expressed as OR with a 95% Confidence Interval (CI); explanatory OR greater than 1.00 indicated a higher likelihood of the outcome, while OR less than 1.00 implied the opposite.

Ethical Clearance

This article does not have ethical clearance because it uses secondary data and is based on permission from The Demographic and Health Surveys (DHS) Program.

RESULT

Table 1. Demographic Characteristic of Women who lived in North Sumatera, Indonesia 2017 (N= 2,440)

Variable	Frequency	
	N	(%)
Area of living		
Rural	1.080	44,3
Urban	1.360	55,7
Literacy		
Low	152	6,2
High	2.288	93,8
Economic status		
Poor	1.033	42,3
Rich	1.407	57,7
Education level		
Low	475	19,5
High	1.965	80,5
Attitude: refuse to have sex if husband has STI		
Female	709	29,1
Male	1.731	70,9

Source: Indonesian Demographic and Health Survey (IDHS) 2017

Continuation of Table 1. Demographic Characteristic of Women who lived in North Sumatera, Indonesia 2017 (N= 2,440)

Variable	Frequency	
	N	(%)
Attitude: refuse to have sex if husband has other women		
No	555	22,7
Yes	1.885	77,3
Had genital ulcer		
No	98	4,0
Yes	2.342	96,0
Had vaginal discharge		
Yes	423	17,3
No	2.017	82,7

Source: Indonesian Demographic and Health Survey (IDHS) 2017

Table 2. Socio-demographic and Women's attitude toward STIs symptoms

	Had genital sore/ulcer				Had vaginal discharge			
	Yes n (%)	No n (%)	OR (95% CI)	p-value	Yes n (%)	No n (%)	OR (95% CI)	p-value
Area of living								
Rural	68 (6,3)	1.012 (93,7)	Ref	0,000	238 (22,0)	842 (78,0)	Ref	0,000
Urban	30 (2,2)	1.330 (97,8)	2,979 (1,924 -4,613)		185 (13,6)	1.175 (86,4)	1,795 (1,453 – 2,218)	
Literacy								
Low	8 (5,3)	144 (94,7)	Ref	0,552	20 (13,2)	132 (86,8)	Ref	0,195
High	90 (3,9)	2.198 (96,1)	1,357 (0,646 – 2,851)		403 (17,6)	1.885 (82,4)	0,709 (0,437 – 1,148)	
Economic Status								
Poor	58 (5,6)	975 (94,4)	Ref	0,001	214 (2,7)	819 (79,3)	Ref	0,000
Rich	40 (2,8)	1.367 (97,2)	2,033 (1,348 – 3,067)		209 (14,9)	1,198 (85,1)	1,498 (1,214 – 1,848)	
Education Level								
Low	25 (5,3)	450 (94,7)	Ref	0,158	88 (18,5)	387 (81,5)	Ref	0,486
High	73 (3,7)	1.892 (96,3)	1,440 (0,904 – 2,294)		335 (17,0)	1.630 (83,0)	1,106 (0,853 – 1,434)	
Attitude: refuse to have sex if Spouse has STI								
Female	31 (4,4)	678 (95,6)	Ref	0,646	88 (12,4)	621 (87,6)	Ref	0,000
Male	67 (3,9)	1,664 (96,1)	1,136 (0,735 – 1,754)		335 (19,4)	1,396 (80,6)	0,591 (0,458 – 0,761)	
Attitude: refuse to have sex if Spouse has other women								
No	16 (2,9)	539 (97,1)	Ref	0,154	81 (14,6)	474 (85,4)	Ref	0,060
Yes	82 (4,4)	1.803 (95,6)	0,653 (0,379 – 1,125)		342 (18,1)	1.543 (81,9)	0,771 (0,593 – 1,003)	

Source: Indonesian Demographic and Health Survey (IDHS) 2017

A total of 2,440 women aged 15-49 years in North Sumatera were included as the sample in this study, as shown in Table 1. The bivariate analysis in Table 2 shows area of living (p-value 0.000, 95% CI 1.924 – 4.613), economic status

(p-value 0.00, 95% CI 1.35 – 3.07), education level (p-value 0.16, 95% CI 0.90 - 2.29), refuse to have sex because spouse has other women (p-value 0.15, 95% CI 0.38 – 1.12) as “having STIs symptoms of genital ulcer in the last 12 months”

variables. Also, women living in rural areas (p-value 0.00, 95% CI 1.45 – 2.22), economic status (p-value 0.00, 95% CI 1.21 – 1.85), and attitude toward refusing sex if their spouses have other women (p-value 0.06, 95% CI 0.59

– 1.00) as “having vaginal discharge in the last 12 months” variables which were <0.25 and were continued to be analyzed on the multivariate level.

Table 3. Multivariate analysis of factors association with STIs symptoms among women aged 15 – 49 years in North Sumatera, Indonesia

Variable	Had Genital Sore/Ulcer			Had Vaginal Discharge		
	OR	95% CI	p-value	OR	95% CI	p-value
Type of residence (<i>rural</i>)	2,68	1,67 – 4,31	0,00	1,74	1,38 – 2,20	0,00
Economic status (<i>poor</i>)	1,47	0,94 – 2,29	0,09	1,33	1,05 – 1,68	0,02
Attitude : refuse to have sex if husband has other women (<i>no</i>)	0,54	0,31 – 0,94	0,03	<i>Not included</i>		
Attitude : refuse to have sex if husband has STI (<i>no</i>)	<i>Not included</i>			0,51	0,40 – 0,66	0,00

Source: Indonesian Demographic and Health Survey (IDHS) 2017

In the logistic regression analysis, as detailed in Table 3, women living in rural areas (OR 2.68, 95% CI 1.67 – 4.308) were associated with having genital sore/ulcer in the last 12 months, whereas women who refused to have sex if their husbands had other women were a protective factor from having genital sore/ulcer in the last 12 months (OR:0.54, 95% CI 0.314 – 0.944). In addition, women living in rural areas (OR,1.74; 95% CI, 1.381 – 2.199) and low economic status (OR:1.33, 95% CI 1.052 – 1.676) were associated with vaginal discharge in the last 12 months, while women who refused to have sex if their husbands had STIs (OR:0.51, 95% CI 0.393 – 0.661) were also protective factors from genital discharge in the last 12 months. (See Table 3)

DISCUSSION

Sexually transmitted infections can be transmitted via sexual contact. Infected individuals might not exhibit any symptoms, but the most common symptoms are vaginal discharge, genital ulcers, abdominal pain, and urethral discharge (WHO, 2022). Chlamydial or gonococcal cervical infection may result in vaginal discharge (Sherrard *et al.*, 2018). In another study, sexually transmitted infections were associated with prior HIV status (Nyemba *et al.*, 2021).

As one of the sexually transmitted infections, HIV testing was increasingly available in several Indonesian government healthcare facilities, with a total of 890 out of 5,124 (17.4%) cases as of 2017, proven with an

increasing number of new cases every year (1.9%) (Kementrian Kesehatan Republik Indonesia, 2018). In North Sumatera in 2017, there were 208 hospitals and 571 public health officers (one per district). The doctor-to-population ratio was 22.1/100,000, but at the time, only about 160 healthcare facilities and 8 hospitals provided HIV testing (Dinas Kesehatan Provinsi Sumatera Utara, 2018) The testing was available through self-divers or health worker referrals, with the goal of alerting patients to risk factors (Kementrian Kesehatan Republik Indonesia, 2018). In 2013, the Indonesian government organized training sessions for PMTCT (Prevention of Mother to Child Transmission), which combined with syphilis prevention for the 12-most HIV cases, including North Sumatera. The program's information and education campaigns (IEC) about reproductive health in family planning, youth counseling services, and MCH were the main points of entry. In addition, health professionals collaborated with CSO, community health workers, and other family members to support this activity by providing psychological support for those involved in risky behavior or work (Kementrian Kesehatan Republik Indonesia, 2015) Furthermore, the government's “Triple Elimination” program, in which all pregnant women were required to undergo Hepatitis B, HIV, and Syphilis testing at a minimum of 80% were more likely to increase the STI screening in women (Kementrian Kesehatan Republik Indonesia, 2021). On the 2017 national scale, the majority of HIV-positive people were male, mostly

MSM (24.2%), with heterosexuality, including husband-wife sexual intercourse, followed by 22.4%. Furthermore, based on occupation, housewives (16.2%) had the second highest number of AIDS cases.

Based on research, women who lived in rural areas were 2.68 times more likely to have genital sore/ulcer, and 1.74 times more likely to have vaginal discharge than those who lived in urban areas. In the rural setting, most women do not seek professional help, such as in healthcare, due to social stigma, socioeconomic conditions, and family communication barriers (Reddy *et al.*, 2020). The attitudes of urban and rural women toward negotiating safe sexual practices varied because of unequal educational and career opportunities. Reflections on how women's ability to make decisions affected their sexual practice and relationship power. (Imo *et al.*, 2022).

Economic disparities were associated with unprotected sex, with low-income people more likely to engage in unprotected sex and risky sexual behavior (Noroozi *et al.*, 2017). Sexually transmitted infections are transmitted via sexual intercourse. The use of condoms was significantly linked to male sex and higher educational status (Mehmandoost *et al.*, 2021). In this study, poor economic status was associated with both STI symptoms, with low-income women 1.467 times more likely to have genital ulcers or soreness and 1.328 times more likely to have vaginal discharge than high-income women. Additionally, there was a strong correlation between poverty and STI-related behaviors and infection (Scheidell *et al.*, 2018). More jobless people were more likely to use drugs and alcohol, be sex workers, and engage in risky sexual practices, but they did not seek treatment due to discrimination by healthcare providers, fear of confidentiality, and a lack of access to treatment centers (Wakgari *et al.*, 2020).

The act of refusing sexual intercourse with a husband who had an STIs was considered a protective factor against genital discharge (OR:0.51, 95% CI 0.393 – 0.661). Avoiding sex might lower the risk of contracting an STI since it reduces the overall exposure to sexual activities (WHO, 2022). People who had multiple sexual partners had lower awareness of STI-related knowledge. Additionally, multiple sexual partners were associated with the

prevalence (Zhong *et al.*, 2022). Because acquired STIs increase the chance of developing other STIs, individuals who have been diagnosed with or treated for an STI should also have their sexual partners tested, which might lower their risk of contracting HIV (Napierala *et al.*, 2020). Multiple lifetime sexual partners, as well as the inconsistent use of condoms, were strongly linked to STIs (Carlos *et al.*, 2017). Several active sexual partners have raised the risk of sexually transmitted illnesses, allowing the virus to spread quickly (Santa-Bárbara *et al.*, 2020). On the other hand, the results showed that refusing to have sex with the husband if he had other women was a protective factor against STI symptoms (OR:0.54, 95% CI 0.314 – 0.944). However, literacy competence and educational level were found to be unrelated to any STI symptoms in this study.

Although not included as variables in this study, those under the influence of alcohol or drugs might choose to engage in unprotected sex and put their partners at risk of STD (Chikova and Chikova, 2019). Cocaine increases it, while cannabis decreases it Click or tap here to enter text (Berry and Johnson, 2018).

Research limitation

This study has several limitations owing to the use of secondary data. This study employed a cross-sectional design, allowing it to identify only associations, rather than causal links. For further research, a cohort or case-control study is preferable for a clearer causal association. Because the data were self-reported, it could have been biased as a result of self-reporting as well as the possibility of providing misleading information.

CONCLUSION

According to this study, socioeconomic status and attitudes toward refusing husband's sex influenced sexually transmitted infections symptoms among women aged 15–49 years in North Sumatra. For instance, women from low socioeconomic backgrounds who lived in rural areas were more likely to experience sexually transmitted infections symptoms, such as vaginal sores/ulcers and vaginal discharge, because they did not seek medical advice before engaging in risky sexual behavior. Likewise, when a spouse had an sexually transmitted infections, women's attitudes toward refusing

sex were protective against genital ulcers. In addition, women's refusal to have sex if their husbands had other women was found to be a protective factor against genital discharge.

SUGGESTION

Without access to sexually transmitted infections testing, the majority of infections are undiagnosed because sexually transmitted infections rarely present with symptoms (Martin *et al.*, 2021). The recommendation for the government or future reproductive health programs is to encourage widespread sexually transmitted infections testing and to emphasize a campaign encouraging responsible sexual behavior. According to another study, doing so might alter and improve a range of sexual behaviors (Millanzi *et al.*, 2022). The intervention might yield positive results, but it depended on the location because each required its own adaptation Click or tap here to enter text. (Ghazi *et al.*, 2022). For advice, married women aged 15-49 years in rural areas with a low economic status should be targeted as program participants.

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CONFLICT OF INTEREST

The authors have no conflict of interest.

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AUTHOR CONTRIBUTION

Aulia Salmaddiina partly conceptualized the analysis, performed data analysis, manuscript writing, referencing, and final review. Almira Nur Hanifah conceptualized the study, performed data analysis, manuscript writing, and referencing.

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