



# Point and Lifetime Prevalence of Sexually Transmitted Diseases Based on the Definitions of the Iranian Syndrome Surveillance System: A Hospital-Based Survey

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## Abstract

**Background:** Sexually transmitted infections (STIs) are among the most common infectious diseases and a globally concerning public health issue, especially in developing countries.

**Objectives:** This study aimed to evaluate the syndrome-based point and lifetime prevalence of sexually transmitted infections in a big Iranian city.

**Methods:** This cross-sectional study was conducted in 2019 on a hospital-based random sample of 2107 people (men and women aged 15 - 50) at Marvdasht Central Hospital (Iran).

**Results:** The lifetime prevalence of Sexually Transmitted Diseases (STDs) was significantly higher in women than in men (81.56% vs. 33.60%, P-value < 0.0001). Also, about 20.7% of men and 48.26% of women had at least one of the STIs-associated syndromes at the time of the interview (instantaneous prevalence) (P-value = 0.001).

**Conclusions:** The estimated prevalence of syndromes associated with sexually transmitted infections is alarmingly high. The results emphasize the need for further studies on effective health care and health promotion services to reduce STIs (including early detection and treatment of infections and public education).

**Keywords:** Prevalence, Sexually Transmitted Diseases, Sits, Syndrome

## 1. Background

Sexually transmitted infections (STIs) are a group of infections that can be contracted through sexual contact and can cause sexually transmitted diseases (STDs). Sexually transmitted infections are the most common acute complications worldwide and can lead to severe and long-term complications (1, 2). Surveillance in the health system is defined as collecting, analyzing, interpreting, and publishing timely, continuous, and regular data related to health events to plan necessary interventions in a health system (3). Surveillance of diseases, especially when it comes to infectious ones, always faces different types of problems, including underreporting cases (3, 4).

In Iran, the "infectious diseases surveillance system" has been integrated into the country's primary health care network. The list of diseases with mandatory reporting

(under surveillance) is reviewed every few years based on the latest circumstances (5). The purpose of establishing a sexually transmitted infection surveillance system is to provide reliable estimations of the incidence and prevalence of sexually transmitted infections and their trends over time (6). Hereby, the control of sexually transmitted infections can be improved, and recording and reporting cases can act as an effective warning system in areas where information about STIs is scarce or outdated. The STIs surveillance system is part of the second-generation HIV/AIDS care system (7). One essential component of the STIs surveillance system is monitoring the incidence and prevalence of STIs. However, despite the importance of monitoring STIs, in most parts of the world, including Iran, the STIs surveillance system remains unreliable (1, 8).

A sexually transmitted disease surveillance system can

be designed on an etiologic or syndromic basis (8, 9). Etiologic-based case-reporting systems require laboratory diagnosis and advanced and costly laboratory support for routine STD surveillance systems. However, in most developing countries, limited or no laboratory services for etiological diagnosis of infections exist, and syndromic case reporting is the only available option for the surveillance of STIs (10). The syndromic registration and reporting system is designed to register and report cases with pre-defined signs and symptoms. This type of surveillance system can be easily set up in all countries. This is because, with minimal costs, the syndromic approach is based merely on the presence of pre-defined syndromes and can provide the necessary information for further actions to monitor and control STIs (8).

Currently, there are only two sources of information regarding the epidemiology of sexually transmitted infections in Iran: (1) individual studies conducted in different parts of the Iranian population (2, 11); and (2) the Iranian syndrome-based surveillance system for STIs. Only a few studies have been conducted on the prevalence of STIs in Iran, and most of them used specific populations with non-random sampling approaches (2, 11-13). Also, due to the variety of centers providing STI treatment services, collecting information for surveillance systems, especially from the private sector, and monitoring the actual trend of STIs is difficult (14, 15). This is partly due to the insufficient cooperation of the private sector in reporting diagnosed cases and also the fact that due to social stigma, many patients, especially men, self-treat themselves or refer to private physicians and pharmacies to hide their condition (15, 16). Moreover, in Iran, the laboratory capacities for diagnosing gonococcal infections (culture and testing of antimicrobial resistance), chlamydia infection (using a serological test instead of Nucleic Acid Amplification), and herpes virus type 2 (lack of a serological test for typing the virus) are limited and expensive. Also, many laboratories do not fully cooperate with the surveillance system and report no cases to surveillance centers (15).

## 2. Objectives

Based on the Iranian syndrome-based STI surveillance system, this study was performed to estimate the point and lifetime prevalence of sexually transmitted infections in the general population of Marvdasht, a large multicultural city in Iran.

## 3. Methods

### 3.1. Type of Study

This is a cross-sectional study of a representative population of sexually active age (aged 15 - 50 years) at Marvdasht Central Hospital, Iran, visitors.

### 3.2. Setting

Marvdasht is the second largest and most populated county in Fars province. The city is located 45 km north of Shiraz and has an altitude of 1620 meters above sea level; fertile lands and factories around the city were cultivated to make Marvdasht the major center of agricultural and industrial activities. As a result, Marvdasht has a multi-cultural and multi-ethnicity population making it a good sample of Iranian cultural and social characteristics (17).

### 3.3. Sampling

The required sample size ( $n = 2000$ ) was calculated based on the results of a pilot study of 200 participants. Sampling was performed all days of the week during the busy hours of the morning and evening shifts (8 am to 2 pm) among men and women aged 15 - 50 years who entered the hospital as visitors. Time-based randomization sampling was performed so that every 12 minutes, one eligible participant was referred to the interview room.

### 3.4. Data Collection

Two interviewers (one female and one male) randomly selected same-sex visitors within the defined age range at the hospital entrance. The study process and its aims were explained to the participants, and because a significant number of the participants were illiterate, verbal consent was obtained if they were ready to participate. The eligible participants were then referred to the hospital outpatient clinic to complete an interview-administered questionnaire via a face-to-face interview in a private and comfortable room. The interviews were conducted by a midwife (for interviewing women participants) and a male nurse (for interviewing men participants).

### 3.5. Inclusion Criteria

All people referred to the hospital were aged 15 - 50.

### 3.6. Exclusion Criteria

People who do not want to participate in the study after being explained fully.

### 3.7. Data Analysis

Descriptive statistics (mean, median, and percentage) were used to summarize the data. Chi-square and *t*-test were used to compare quantitative and qualitative variables distribution among the comparing groups. STATA v.13.1 was used for data analysis. The difference is considered statistically significant if  $P < 0.05$ .

#### 4. Results

A total of 2107 participants (1191 males and 916 females) with an average age of  $33.11 \pm 72$  years participated in the study. Table 1 shows the demographic characteristics of all participants in the study.

**Table 1.** Demographic Characteristics of the Participants in the Study

Variables	Male (%)	Female (%)
<b>Marital status</b>		
Single	386 (32.5)	176 (19.2)
Married	793 (66.9)	702 (76.4)
Widowed/divorced	7 (0.6)	41 (4.5)
<b>Age</b>		
< 20	87 (9.8)	101 (11)
21 - 30	304 (34.2)	254 (27.7)
31 - 40	337 (37.9)	374 (40.7)
41 - 50	162 (18.2)	189 (20.6)
<b>Having sex</b>	964 (81.1)	871 (97.4)
<b>Having urinary tract infections</b>	119 (10.1)	336 (38.5)

Overall, the lifetime prevalence of STDs was significantly higher in women than in men (81.56% vs. 33.60%,  $P$ -value < 0.0001). Also, 20.7% of men and 48.26% of women had at least one of the STI-related symptoms at the time of the interview (instantaneous prevalence) ( $P$ -value = 0.001) (Table 2).

Men with a history of the defined syndromes were, on average older than men without the syndromes ( $P$ -value = 0.0003). However, in women, there was no significant age difference between those with and without syndromes in the past (Tables 3 and 4).

#### 5. Discussion

The results of our study suggested that more than one-third of male and more than 80% of female participants have experienced at least one of the symptoms associated with sexually transmitted infections during their sexually active life. Also, more than 20% of men and one-third of women currently suffer from at least one defined symptom. A study conducted in Guntur to measure the prevalence of sexually transmitted infections in women of child-bearing ages showed that the lifetime prevalence of the syndrome was 32.69%, which was generally close to what was reported in our study (18). Also, a study by Nasiriyan et al. (14) in Kerman (another city in Iran) suggested that 16.66% of men and 33% of adult women in Iran had at least one of the symptoms of sexually transmitted infections at the time that they were interviewed. Again, the results

are close to the results of our study. In addition, a study by Mousavi et al. on urban and rural general populations showed that one-third of men and more than two-thirds of women in the general population had experienced at least one of the symptoms associated with sexually transmitted infections since the age of 15. Moreover, 20.7% of men and more than a quarter of women currently suffer from the syndromes associated with sexually transmitted infections (18).

The point prevalence and lifetime prevalence of syndromes were significantly higher in women than in men. This issue may be because women care more about their health, pay more attention to symptoms, and remember and report them better (19). And on the other hand, this issue may be due to the low sensitivity and specificity of some symptoms related to sexually transmitted infections, especially in women. Some symptoms are also found in other diseases; having that symptom does not mean 100% having sexually transmitted infections (20-22).

The results of the current study showed that 36.6% of women were suffering from abnormal discharge from their genital organs, 0.9% had ulcers in the genital area, and 23.9% had pain in the lower abdomen. In a study conducted in Guntur, 27.88% of women had abnormal vaginal discharge, 1.34% had genital sores, and 3.46% had mild abdominal pain (23). In the current study, about 3.5% of men were suffering from genital sores, and about 58% of women have experienced abnormal vaginal discharge since the age of 15.

These results are close to a study conducted in Iran in 1390, which showed that 4.9% of men and 40% of women had experienced genital ulcers and abnormal vaginal discharge during their lifetime, respectively (12). In the present study, women reported more STI syndromes among the study participants. One possible justification for such a pattern is that women care more about their health, pay more attention to symptoms, and better remember and report their past health experiences. On the other hand, the difference between men and women may be due to the low sensitivity and specificity of some symptoms related to sexually transmitted infections, especially in women. This is because some symptoms are also found in other non-STI diseases. As a result, having symptoms does not necessarily mean the individual has a sexually transmitted infection (20-22).

In this study, individuals with the symptoms were older than those without the symptoms (in both men and women), and the highest prevalence in both lifetime and point prevalence was in the age group 30 - 40. Regarding the currently presented syndromes, the average age of women was 34.60 (43.71 - 25.49). Again, the prevalence of symptoms associated with sexually transmitted infections varies between different age groups. The prevalence of

**Table 2.** Prevalence of Sexually Transmitted Infections (Stis) in the Male and Female Participants

Symptoms	Male Point		Male Lifetime	
	No. (%)	(%95 CI)	No. (%)	(%95 CI)
Dysuria	67 (5.6)	(0.0446 - 0.0709)	196 (16.5)	(0.1447 - 0.1868)
Frequency urination (urination more often than normal during the day)	37 (3.1)	(0.0226 - 0.0311)	54 (4.5)	0.035 - 0.0588)
Any sores in the genital area <sup>a</sup>	23 (02.)	(0.0129 - 0.0288)	42 (3.5)	(0.0262 - 0.0474)
Abnormal discharge from the genital area	23 (1.9)	(0.0129 - 0.0288)	76(6.4)	(0.0514 - 0.0792)
Bleeding or non-bloody discharge from the anus	10 (0.8)	(0.0046 - 0.0154)	37 (3.1)	(0.0226 - 0.0426)
Testicular pain and swelling	18(1.5)	(0.0096 - 0.0238)	112 (9.4)	(0.0788 - 0.112)
Swelling and redness in the scrotum	120 (10.1)	(0.085 - 0.1192)	2 (0.2)	(0.05 - 0.61)
Dyspareunia	6 (0.6)	(0.23 - 01,09)		
Pain after intercourse (after ejaculation)	20 (2.1)	(1.09 - 2.58)		
Total symptoms	246 (20.7)	(18.47 - 23.06)	400 (33.6)	(30.98 - 36.34)
P-value <sup>b</sup>	0.001	< 0.0001		
Symptoms	Female Point		Female Lifetime	
	No. (%)	(%95 CI)	No. (%)	(%95 CI)
Mild abdominal pain (except menstrual pain)	221 (23.9)	(21.33 - 26.83)	452 (49)	(45.8 - 52.24)
Dysuria	178 (19.3)	(16.89 - 21.98)	348 (37.7)	(34.67 - 40.91)
Frequency urination	81 (8.8)	(7.13 - 10.79)	125 (13.5)	(11.5 - 15.92)
Abnormal genital	338 (36.6)	(33.61 - 39.82)	534 (57.9)	(54.71 - 61.07)
Genital sores <sup>a</sup>	8 (0.9)	(0.44 - 01.71)	70 (7.9)	(5.58 - 8.75)
Abnormal discharge from the anus	10 (1.1)	(0.5 - 1.98)	22 (2.4)	(1.5 - 4.0)
Any sores on the skin of the anal area	2 (0.2)	(0.06 - 0.79)	1 (0.1)	(0.02 - 0.61)
Itching on the inside or outside of the genital area	194 (21)	(18.53 - 23.79)	338 (36.6)	(33.56 - 39.87)
Dyspareunia	264 (38.71)	(33.13 - 42.42)	-	-
Pain after intercourse	142 (20.82)	(17.94 - 24.03)	-	-
Bleeding after intercourse	22 (3.3)	(2.14 - 4.84)	-	-
Total symptoms	445 (38.26)	(45.05 - 51.49)	752 (81.56)	78.93 - 83.93

<sup>a</sup> Painful or painless (blistering or non-blistering) on the skin of the genital area/anus/the distance between the genital area and the anus/the innermost parts of the genital area.

<sup>b</sup> Comparison of point and lifetime prevalence of syndromes in men and women.

**Table 3.** Presence of the Defined Syndromes by Age

Variables	Now		Past	
	Mean ± SD	P-Value	Mean ± SD	P-Value
<b>Male</b>		0.50		0.003
Symptoms reported	31.79 ± 8.70		33.63 ± 8.57	
Symptoms reported	32.34 ± 8.67		31.72 ± 8.70	
Mean difference	-0.55 ± 0.11		1.91 ± 0.50	
<b>Female</b>		0.003		0.59
Symptoms reported	34.55 ± 6.75		32.94 ± 8.82	
No symptoms reported	31.28 ± 9.72		32.53 ± 9.24	
Mean difference	3.27 ± 2.15		0.41 ± 0.71	

**Table 4.** Demographic Status of People with and Without the Defined Syndromes

Variables	Point Prevalence; No. (%)			Lifetime Prevalence; No. (%)		
	No Symptoms	Having Symptoms	P-Value	No Symptoms	Having Symptoms	P-Value
<b>Male (marital status)</b>			0.561			0.192
Single	308 (78.4)	85 (21.6)		271 (69)	122 (31)	
Married	632 (79.7)	161 (20.3)		517 (65.2)	276 (34.8)	
<b>Age</b>			0.932			0.031
< 20	72 (82.8)	15 (17.2)		67 (77)	20 (23)	
21 - 30	259 (85.2)	45 (14.8)		234 (77)	70 (23)	
31 - 40	286 (84.9)	51 (15.1)		232 (68.8)	105 (31.2)	
41 - 50	139 (85.8)	23 (14.2)		108 (66.7)	54 (33.3)	
<b>Female (marital status)</b>			< 0.0001			0.334
Single	182 (83.9)	35 (16.1)		45 (20.7)	172 (79.3)	
Married	293 (41.7)	409 (58.3)		125 (17.8)	577 (82.2)	
<b>Age</b>			< 0.0001			0.391
< 20	87 (86.1)	14 (13.9)		24 (23.8)	77 (76.2)	
21 - 30	133 (52.4)	121 (47.6)		45 (17.7)	209 (82.3)	
31 - 40	161 (43.0)	213 (57.0)		63 (16.8)	311 (83.2)	
41 - 50	94 (49.7)	95 (50.3)		38 (20.1)	151 (79.9)	

sexually transmitted infections seems higher in younger participants who are more sexually active (24). However, some symptoms associated with sexually transmitted infections are less specific and are more commonly reported in older individuals without STI infection (i.e., these symptoms may appear due to other illnesses than STIs) (25).

This study suggested that symptoms are more common in married women than in single individuals. One of the possible reasons for this finding is the social stigma, which is more imposed on single individuals by society in Iranian Muslim society; extramarital sex is not socially acceptable, and single people with sexually transmitted infections are more ashamed to express their illness and symptoms (26, 27). As a result, they may refuse to express these symptoms, and the prevalence of these symptoms in the population is underestimated.

### 5.1. Limitations

One of the most important challenges of studying STIs and their related behaviors is being highly sensitive, and the cultural and social stigma leads to a lower participation rate and underreporting in such studies. Depending on the importance and severity of each symptom, different degrees of reporting and recall bias may occur in the study.

Although some sexually transmitted infections are asymptomatic, syndromic surveillance has low sensitivity and specificity due to non-syndromic infections. However, such a surveillance approach is believed to be valid enough

to monitor the trend and distribution of STIs in most communities (10).

### 5.2. Conclusions

The present study's estimated point and lifetime prevalence of the selected syndromes associated with sexually transmitted infections were alarmingly high. The results emphasize the need for widely available and effective STI-related health and medical services to reduce current infections and prevent new ones in the Iranian population.

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### Footnotes

**Authors' Contribution:** Study concept and design: MM, MF, and PAK; Acquisition of data: MMDB and RI; Analysis and interpretation of data: MM and MMDB; Drafting of the manuscript: MM; Critical revision of the manuscript for important intellectual content: MF; Statistical analysis: MM and MMDB; Administrative, technical, and material support: MM, MF; Study supervision: MF.

**Conflict of Interests:** The authors declare that they have no conflict of interest.

**Data Reproducibility:** The data presented in this study are uploaded during submission as a supplementary file and are openly available for readers upon request.

**Ethical Approval:** The protocol of the present study is approved by the ethical committee of Shiraz University of Medical Sciences, reference code: IR.SUMS.REC.131096.

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