


Sexual behavioral factors of the subjects visiting the clinic of sexually transmitted infections in Northern Finland: A cross-sectional study among 775 subjects

Iiro Repo¹ | Atte Sopenlehto¹ | Laura Huilaja² | Jari Jokelainen³ |
Eetu Kiviniemi³ | Suvi-Päivikki Sinikumpu² 

¹Faculty of Medicine, University of Oulu, Oulu, Finland

²Department of Dermatology, Oulu University Hospital, Oulu, Finland and Research Unit of Clinical Medicine, University of Oulu, Oulu, Finland

³Northern Finland Birth Cohorts, Arctic Biobank, and Infrastructure for Population Studies, University of Oulu, Oulu, Finland

Correspondence

Suvi-Päivikki Sinikumpu, Department of Dermatology, Oulu University Hospital, Oulu, Finland, P.B.20, FIN-90029 OYS, Finland.
Email: suvi-paivikki.sinikumpu@oulu.fi

Abstract

Background and Aims: Sexually transmitted infections (STI) are among the most common infections globally. However, the sexual behavioral factors and sexual history of people visiting STI clinics have only been surveyed in a few studies. We aimed to evaluate the characteristics of the patients visiting the open STI clinic.

Methods: This is a prospective observational study performed in the STI clinic in the premises of Department of Dermatology, Oulu University Hospital. All individuals ($n = 775$) attending the STI clinic between February and August 2022 were included to the study and the profile of the patients was evaluated.

Results: We found that the majority of the STI clinic attendees (58.5%) were female. Mean age of the study population was 28.9 years, with females being significantly younger than males ($p < 0.001$). Only one-third (30.6%) of the patients reported having symptoms at the time of attending. Most commonly, patients had had one sex partner in the last 6 months. However, one-fifth (21.7%) reported several sex partners (over four). Almost half of the patients (47.6%) reported using a condom only randomly. Those with heterosexual orientation had fewer multiple-sex partners ($p < 0.001$) than those with homo- or bisexual orientation ($p < 0.05$).

Conclusion: It is important to increase knowledge about the profile of STI clinic visitors to effectively target STI prevention on the groups at the highest risk of STIs.

KEYWORDS

condom use, sexual behavior, sex partner, sexual risky behavior, sexually transmitted infection

Iiro Repo and Atte Sopenlehto contributed equally to this article.

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1 | INTRODUCTION

Sexually transmitted infections (STIs) are a major health problem around the world, and they can have long-term consequences, especially if left untreated.¹ The morbidity risk is related especially to the following bacterial, parasitic and viral STIs: *Chlamydia trachomatis* (chlamydia), *Neisseria gonorrhoeae* (gonorrhoea), *Treponema pallidum* (syphilis), *Trichomonas vaginalis* (trichomoniasis), *human papillomavirus* (HPV), HIV, herpes simplex virus (HSV), and *hepatitis B virus* (HBV).² STIs are acquired by transmission occurring during sexual intercourse or from mother to child during pregnancy and childbirth.^{3,4} STIs have a high impact on health: they can cause infertility, pregnancy complications, cancer, genital symptoms, psychosocial consequences and decreased quality of life.² STIs compromises a major economic burden, too, by causing medical costs (e.g. diagnose, treatments, complications and adverse STI outcomes).² In recent years, the number of STIs has been increasing in Finland and in other European countries,^{1,5,6} mostly because of changes in sexual behaviors.⁷

STIs can affect anyone regardless of age, ethnicity, and sexual orientation, but some groups are at greater risk: adolescents and young adults, racial and ethnic minorities, men who have sex with men (MSM), and those with risky sexual behavior have been reported to have heightened risk for STIs.⁷⁻¹⁰ In the United States, almost half of STI incidents affect adolescents or young adults.¹¹ Correspondingly, in Finland, the majority of the STIs reported in 2022 (60% of *C. trachomatis* and 26% of *N. gonorrhoeae* cases) were in the age group 15–24.⁵

The characteristics of people who have attended STI testing have previously been surveyed in a few studies.^{7,8,11-14} A study conducted among university students ($n = 1294$, mean age 23.6) explored the psychosocial determinants of STI testing in Scotland.¹³ This study found that women and students over 25 years old were more likely to have STI testing in their past compared to men or younger students.¹³ In a US study among young adults (aged 18–20, $n = 817$), female gender and risky sexual behavior (e.g., alcohol-related sexual consequence, non-condom related sex and casual sex) were associated with a higher frequency of STI testing.¹¹ A hospital-based US study among younger patients (adolescents aged 14–18 years, $n = 59,158$) found that older age, female gender, and low socioeconomic status were associated with STI testing.¹⁴

To diminish the global burden of STIs, prevention strategies are needed. In recent years, clear success in STI control has been achieved by deploying effective vaccines against HPV.^{2,15,16} Besides vaccines, primary prevention interventions are crucial. More knowledge and education should be given on the immediate and long-lasting risks of STIs, testing opportunities, treatments and safer sexual behavior such as the correct use of condoms.² These targets can be implemented better by recognizing the patients in higher risk of STIs. Thus, the aim of this study was to evaluate the profile of the patients who visited the open STI clinic at the premises of Oulu University Hospital.

2 | PATIENTS AND METHODS

The Department of Dermatology in Oulu University Hospital (OUH) hosts a STI clinic run by qualified nurses. Any person living in the Oulu area has the possibility to book a free appointment to be tested for STI when willing to do so. No referral is needed. However, there is a limited number of weekly appointments available and those are booked online on a first-come basis. Routinely, screening for chlamydia, gonorrhoea, syphilis and HIV is performed for every individual. All individuals visiting the STI clinic in the OUH between February 1 and August 30, 2022 were included in the study. Data were collected from the preliminary information forms which patients are routinely asked to complete before their appointment in the clinic. This form included questions about the patient's sexual health and sexual life (Tables 1 and 2). The data were manually transferred into REDCap electronic data capture tools hosted by the University of Oulu. Data are presented as means, standard deviation (SD) and range, and as proportions for categorical variables. A χ^2 test and analyses of variance were used to test differences between genders. A p -value of ≤ 0.05 was considered statistically significant. The medical director of the OUH had approved the study.

3 | RESULTS

3.1 | Basic characteristics of the STI clinic visitors

This study included a total of 775 patients, of whom 58.5% were female and 41.5% males. Table 1 shows demographics and sexual history-related characteristics of the patients. The mean age of the study population was 28.9 years, females (27.8) being significantly younger than males (30.5) ($p < 0.001$). The majority of the patients visited the clinic on their own initiative (88.3%), females more often than males ($p < 0.05$), and one-third (30.6%) of the patients reported having some symptoms at the time of attending. The most typical symptoms in females were vaginal discharge (53.1%, $n = 78/147$) and lower abdominal pain (33.3%, $n = 49/147$), whereas in males, "dermatitis or pruritus" (40.0%, $n = 36/90$) was the most frequent symptom. In most patients, symptoms had started less than a month ago (36.3%, $n = 86/237$), and the most recent unprotected sex contact had been less than two weeks ago (19.4%, $n = 150/775$). Based on patients' thoughts, the majority of the suspected STI infections were obtained in Finland (85.4%). During the study period, 54 *C. trachomatis* (chlamydia), three *N. gonorrhoeae* (gonorrhoea), and one *T. pallidum* (syphilis) infections were diagnosed in our STI clinic.

3.2 | The history of previous STI

In our study, a previously treated STI was seen more often in females (34.2%, $n = 155/453$) than in males (18.9%, $n = 61/322$) ($p < 0.001$). The most common previous STI was chlamydia (66.7%), followed by condyloma (17.1%) and herpes (6.9%). Typically, the previous STI was

TABLE 1 Demographics and sexual history-related characteristics of STI clinic patients according to gender.

	Male n (%)	Female n (%)	All n (%)	p-Value
Number of patients	322 (41.5)	453 (58.5)	775 (100)	
Age, years, mean (SD)	30.5 (9.1)	27.8 (8.0)	28.9 (8.6)	<0.001 ^a
Range	16-76	15-64	15-76	
Reason for admission				
On own initiative	274 (85.1)	410 (90.5)	684 (88.3)	0.02 ^b
On sex partner's initiative	34 (10.6)	18 (4.0)	52 (6.7)	<0.001 ^b
Doctor's referral	1 (0.3)	5 (1.1)	6 (0.8)	0.21 ^b
No answer	23 (7.1)	28 (6.2)	51 (6.6)	0.59 ^b
Are you currently symptomatic				0.31 ^b
Yes	90 (28.0)	147 (32.5)	237 (30.6)	
No	228 (70.8)	303 (66.9)	531 (68.5)	
No answer	4 (1.2)	3 (0.7)	7 (0.9)	
What symptoms do you have currently				
Vaginal discharge	0 (0.0)	78 (53.1)	78 (32.9)	
Burning when urinating	24 (26.7)	28 (19.0)	52 (21.9)	
Dermatitis or pruritus	36 (40.0)	30 (20.4)	66 (27.8)	
Urethral discharge	5 (5.6)	3 (2.0)	8 (3.4)	
Lower abdominal pain	8 (8.9)	49 (33.3)	57 (24.1)	
Genital sores or blisters	14 (15.6)	13 (8.8)	27 (11.4)	
Genital warts	16 (17.8)	9 (6.1)	25 (10.5)	
Something else	13 (14.4)	26 (17.7)	39 (16.5)	
When did your symptoms start				0.91 ^b
< 1 month ago	34 (37.8)	52 (35.4)	86 (36.3)	
1-2 months ago	14 (15.6)	22 (15.0)	36 (15.2)	
2-6 months ago	5 (5.6)	10 (6.8)	15 (6.3)	
>6 months ago	6 (6.7)	8 (5.4)	14 (5.9)	
No answer	31 (34.4)	55 (37.4)	86 (36.3)	
The most recent unprotected sex contact				0.78 ^b
<2 weeks	61 (18.9)	89 (19.6)	150 (19.4)	
2-4 weeks	57 (17.7)	91 (20.1)	148 (19.1)	
1-2 months	55 (17.1)	79 (17.4)	134 (17.3)	
2-4 months	45 (14.0)	55 (12.1)	100 (12.9)	
4-6 months	8 (2.5)	7 (1.5)	15 (1.9)	
>6 months ago	20 (6.2)	22 (4.9)	42 (5.4)	
I don't remember	0 (0.0)	1 (0.2)	1 (0.1)	
No answer	76 (23.6)	109 (24.1)	185 (23.9)	
Country in which possible infection was contracted				0.92 ^b
Finland	273 (84.8)	389 (85.9)	662 (85.4)	
Abroad	13 (4.0)	18 (4.0)	31 (4.0)	

(Continues)

TABLE 1 (Continued)

	Male n (%)	Female n (%)	All n (%)	p-Value
I don't know	2 (0.6)	4 (0.9)	6 (0.8)	
No answer	34 (10.6)	42 (9.3)	76 (9.8)	
Have you been tested for STIs (last 12 months)				<0.05 ^b
Yes	95 (29.5)	179 (39.5)	274 (35.4)	
No	221 (68.6)	258 (57.0)	479 (61.8)	
No answer	6 (1.9)	16 (3.5)	22 (2.8)	
Have you ever been treated for an STI				<0.001 ^b
Yes	61 (18.9)	155 (34.2)	216 (27.9)	
No	238 (73.9)	268 (59.2)	506 (65.3)	
No answer	23 (7.1)	30 (6.6)	53 (6.8)	
Which STI have you been treated for (if any) ^c				
Chlamydia	39 (63.9)	105 (67.7)	144 (66.7)	
Gonorrhea	3 (4.9)	1 (0.6)	4 (1.9)	
Syphilis	0 (0.0)	0 (0.0)	0 (0.0)	
Herpes	2 (3.3)	13 (8.4)	15 (6.9)	
Condyloma	10 (16.4)	27 (17.4)	37 (17.1)	
HIV	0 (0.0)	0 (0.0)	0 (0.0)	
Hepatitis	0 (0.0)	0 (0.0)	0 (0.0)	
No answer	9 (14.8)	14 (9.0)	23 (10.6)	
When was the previous STI treated ^c				
< 6 months ago	7 (11.5)	12 (7.7)	19 (8.8)	
6–12 months ago	5 (8.2)	22 (14.2)	27 (12.5)	
>12 months ago	31 (50.8)	88 (56.8)	119 (55.1)	
I don't know	1 (1.6)	2 (1.3)	3 (1.4)	
No answer	17 (27.9)	33 (21.3)	50 (23.1)	

Abbreviations: ANOVA, analysis of variance; SD, standard deviation; STI, sexually transmitted infection.

^aLinear model ANOVA.

^bPearson's Chi-squared test.

^cSome patients reported multiple STIs.

treated more than a year ago. Females were more often tested for STIs during the past 12 months (39.5%) compared with males (29.5%) ($p < 0.05$). Most (64.8%) patients did not know whether their sex partner had an STI. Among the cases where it was known, the most common STI of the sex partner was chlamydia (70.4%).

3.3 | The profile of sex partners, the use of condom, and risky sexual behavior

Most males (27.0%) had only had one partner during the last 6 months, whereas females had most commonly had two partners (23.0%). Several sex partners (over four) were reported by one-fifth

(21.7%) of the patients. Slightly less than half (48.7%) of the patients' sex partners were casual contacts. Vaginal intercourse was the most common type of sexual interaction (90.1%). No statistically significant differences were found in the number of partners. In our study population, 8.7% of the males reported having sex with men (MSM). Almost half of all cases (47.6%) reported using a condom randomly, while 17.1% of males and 19.9% of females reported that they always used a condom. (Table 2). To analyze the possible differences in risky sexual behavior, those with MSM/bisexual orientation were compared with those reporting heterosexual orientation. We found that those with heterosexual orientation had fewer "never used condom" answers ($p < 0.05$), less previous STI testing during the last 12 months (not statistically significant difference), fewer multiple sex

TABLE 2 Sex partner and sex behavior related characteristics of STI clinic patients.

	Male n (%)	Female n (%)	All n (%)	p-Value ^a
Number of patients	322 (41.5)	453 (58.5)	775 (100)	
Gender of sex partner				<0.001
Same	28 (8.7)	3 (0.7)	31 (4.0)	
Opposite	279 (86.7)	426 (94.0)	705 (91.0)	
Both	2 (0.6)	13 (2.9)	15 (1.9)	
No answer	13 (4.0)	11 (2.4)	24 (3.1)	
Type of sex partner				0.38
Casual contact	159 (49.4)	218 (48.1)	377 (48.7)	
Regular contact	82 (25.5)	135 (29.8)	217 (28.0)	
Both	19 (5.9)	30 (6.6)	49 (6.3)	
No answer	62 (19.3)	70 (15.5)	132 (17.0)	
The number of sex partners (last 6 months)				0.060
0	4 (1.2)	7 (1.5)	11 (1.4)	
1	87 (27.0)	96 (21.2)	183 (23.6)	
2	64 (19.9)	104 (23.0)	168 (21.7)	
3	47 (14.6)	82 (18.1)	129 (16.6)	
4-9	61 (18.9)	107 (23.6)	168 (21.7)	
10 or more	11 (3.4)	15 (3.3)	26 (3.4)	
No answer	48 (14.9)	42 (9.3)	90 (11.6)	
Does your sex partner have an STI				<0.05
Yes	30 (9.3)	24 (5.3)	54 (7.0)	
No	97 (30.1)	111 (24.5)	208 (26.8)	
I don't know	192 (59.6)	310 (68.4)	502 (64.8)	
No answer	3 (0.9)	8 (1.8)	11 (1.4)	
Which STI does your partner have				
Chlamydia	19 (63.3)	19 (79.2)	38 (70.4)	0.28
Gonorrhea	0 (0.0)	1 (4.2)	1 (1.9)	0.40
Syphilis	0 (0.0)	0 (0.0)	0 (0.0)	
Herpes	4 (13.3)	4 (16.7)	8 (14.8)	0.63
Condyloma	3 (10.0)	1 (4.2)	4 (7.4)	0.17
HIV	1 (3.3)	0 (0.0)	1 (1.9)	0.24
Hepatitis	0 (0.0)	0 (0.0)	0 (0.0)	
No answer	3 (10.0)	0 (0.0)	3 (5.6)	<0.05
Type of sexual interaction ^b				
Vaginal intercourse	264 (82.0)	434 (95.8)	698 (90.1)	<0.001
Oral intercourse	234 (72.7)	362 (79.9)	596 (76.9)	<0.05
Anal intercourse	45 (14.0)	67 (14.8)	112 (14.5)	0.75
No answer	21 (6.5)	14 (3.1)	35 (4.5)	<0.05
Condom use rate				<0.05
Always	55 (17.1)	90 (19.9)	145 (18.7)	

(Continues)

TABLE 2 (Continued)

	Male n (%)	Female n (%)	All n (%)	p-Value ^a
Never	58 (18.0)	44 (9.7)	102 (13.2)	
Randomly	158 (49.1)	211 (46.6)	369 (47.6)	
No answer	51 (15.8)	108 (23.8)	159 (20.5)	
Do you use more than one contraceptive method				<0.001
Yes	55 (17.1)	145 (32.0)	200 (25.8)	
No	267 (82.9)	308 (68.0)	575 (74.2)	

Abbreviation: STI, sexually transmitted infection.

^aPearson's Chi-squared test.

^bMultiple answers allowed.

partners (≥ 4 partners in 6 months) ($p < 0.001$), and more regular partners than those with MSM/bisexual orientation ($p < 0.05$) (Table 3).

4 | DISCUSSION

This study evaluated the patient profile in 775 subjects who sought for STI testing at the STI clinic of OUH. The mean age of the current study population was 28.9 years, which is in line with previous studies reporting an age range from 24.8 to 32.2 years for those visiting STI clinics. Our findings further strengthen the notion that young adults are the most willing group to be STI tested.^{9–11} The vast majority of the patients in our study were females (58.5%). Globally, STI clinics' patient profiles seem to have differences in gender distribution: For example, in a study from India, only 28.2% of the patients attending STI clinics were females.¹⁷ In contrast, in a large cross-sectional study of 18–49-year-old patients attending STI clinics in China, most patients (69.1%) were females.¹² These differences might be explained by cultural and epidemiological factors.

There were some differences in sexual behavior between males and females among our STI visitors' profiles; we found that females attending the clinic were younger than males and more eager to be tested because of suspected symptoms. Additionally, females were more often tested and treated for previous STIs than males. Women also reported more regular use of condoms than males. Correspondingly, according to a study from Scotland, women had more commonly a past with previous STI testing and less risky sexual behavior (e.g., more use of condoms and lower number of partners) than males.¹³ Similar findings were also seen in a Swedish study.⁸

In the current study, over half (68.5%) of the patients visited the STI clinic without current STI symptoms. Previous studies have contradictory reports about correlation between symptoms and willingness to be tested for STI depending on the geographical area: In a large Dutch study ($n = 101,710$), 65% of the patients attended STI testing without symptoms,¹⁸ and in a Swedish study, only 17% of the patients reported symptoms to be the main reason to seek for STI

testing.⁸ In contrast, in studies conducted in Spain and Italy, the majority of the patients (63.6% and 76.9%, respectively) attended the STI clinic because of symptoms.^{7,9} In the present study, most of the patients attended the STI clinic of own initiative. However, 10% of the males visited the clinic because of partner's suggestion. We found that over one-third of the patients had been STI tested within 12 months: it is most likely they wanted to be tested just in case, that is, when starting with a new sex partner.

Although most of our patients were symptomless when attending the STI clinic, 6% reported a treated STI within the last year, and one-third ever. Of these, self-reported history of diagnosed chlamydia was the most common in both genders (66.7%), followed by condylomas. Even though not directly comparable with our study, in a study from the Netherlands in 2015, the prevalence of chlamydia was 14.9% among heterosexual STI clinic visitors.¹⁸ In another study of patients attending chlamydia testing in Stockholm, Sweden, 34.9% of females and 28.5% of males self-reported having had a chlamydia infection at least once.⁸

Less than half of our patients answered that they used a condom 'only randomly'. In addition, 18% of the males reported that they had never used a condom. Correspondingly, in an Italian study ($n = 294$), 42.5% of the cases visiting STI clinic reported that they sometimes used a condom,⁷ and in a US study ($n = 1,419$), only a quarter of the patients were in the habit of using a condom in vaginal sex.¹⁰ There is strong evidence that low condom use increases the risk for STIs⁹ and, in turn, that when a condom is used correctly and regularly, the risk for all STIs decreases. There are many possible explanations for the low condom use; some young people may still be unaware of the ways STIs are transmitted (i.e., the use of condoms is rare in connection with other than vaginal sex), alcohol use in relation to sex leads to less responsible behavior, and finally, there is a fear of decreased sexual pleasure when using a condom.⁹

In this study, nearly half (46.7%) of the patients stated that they had had two or fewer sex partners during the last 6 months. However, interestingly, as many as 22% of our patients had had more than four sex partners during that time. It is noteworthy that the increasing number of sex partners suggests sexual risk behavior and

TABLE 3 Comparison of sexual behavior between two different groups (according to the gender of sex partner).

	Gender of sex partner			p Value ^a
	Same/both (N = 46)	Opposite (N = 705)	Total (N = 751)	
The use of condom ^b				<0.05
Always	12 (27.3%)	126 (22.6%)	138 (22.9%)	
Never	10 (22.7%)	89 (15.9%)	99 (16.4%)	
Randomly	21 (47.7%)	340 (60.9%)	361 (60.0%)	
The number of sex partners (last 6 months)				<0.001
0	2 (4.3%)	8 (1.1%)	10 (1.3%)	
1	5 (10.9%)	170 (24.1%)	175 (23.3%)	
2	7 (15.2%)	156 (22.1%)	163 (21.7%)	
3	5 (10.9%)	121 (17.2%)	126 (16.8%)	
4-9	14 (30.4%)	151 (21.4%)	165 (22.0%)	
10 or over	6 (13.0%)	19 (2.7%)	25 (3.3%)	
No answer	7 (15.2%)	80 (11.3%)	87 (11.6%)	
Have you been tested for STIs (last 12 months)				0.382
No	27 (58.7%)	434 (61.6%)	461 (61.4%)	
Yes	19 (41.3%)	249 (35.3%)	268 (35.7%)	
No answer	0 (0.0%)	22 (3.1%)	22 (2.9%)	
Have you ever been treated for an STI				0.987
No	30 (65.2%)	463 (65.7%)	493 (65.6%)	
Yes	13 (28.3%)	194 (27.5%)	207 (27.6%)	
No answer	3 (6.5%)	46 (6.5%)	49 (6.5%)	
Type of sex partner				<0.05
Both	7 (15.2%)	40 (5.7%)	47 (6.3%)	
Casual contact	24 (52.2%)	346 (49.1%)	370 (49.3%)	
Regular	7 (15.2%)	198 (28.1%)	205 (27.3%)	
No answer	8 (17.4%)	121 (17.2%)	129 (17.2%)	

Abbreviation: STI, sexually transmitted infection.

^aThere is some missing data since all patients did not answer to the question about the use of any contraceptives.

^bPearson's Chi-squared test.

thus, to increased risk of STIs.⁹ The number of partners of those visiting STI clinics has been evaluated in other studies as well: In a Swedish study ($n = 2814$ subjects, mean age ~ 27 years), a fifth of the subjects (22.1%) had had two or fewer sex partners during the last 12 months⁸ and in an Italian study ($n = 294$, mean age 49.9 years), 39% had had two or few partners during the last 6 months.⁷ However, the time period, as well as the baseline characteristics of the study subjects, differed from our study, preventing direct comparison.

The majority of our cases had heterosexual orientation (91.0%); MSM was reported in 8.7% and bisexual orientation in 2%. There seem to be great differences in the relative numbers of MSM

individuals attending different STI clinics. For example, in an Italian study, 34.3% of patients were MSM and in a Spanish study, approximately 17% were homo- or bisexual.^{7,9} Previous studies have suggested that MSM is a sexual group that is at higher risk of STIs than general population.⁷ MSM as well as bisexual subgroups have been linked to more risky sexual behavior, such as a tendency to have numerous sex partners, low use of condom and higher risk of STIs, and a tendency to seek repeatedly for STI testing.^{7,8} In the present study, we also found that those with homo- or bisexual orientation had a higher number of sex partners (≥ 4), more casual partners, and more STI testing in their past than those with partners of the

opposite gender. Risky behavior can consist of many other factors as well; for example, in our whole study population, the majority of the patients did not know whether their partner had a current STI or not, which can also be considered a risk factor.

The major strength of this study is related to the study population. The STI clinic of OUH is a low-threshold clinic available for all, which reduces the selection of the population. All patients filled the preliminary information survey and were accepted to the study. We did not focus only on the last event of the patients' sexual history, which enabled us to get a better view of the patients' typical and longer-term sexual behavior. The current study also has some limitations. First, there could be some information bias concerning patients' recall accuracy since some of the survey questions were about the past. In some questions, quite a large proportion of patients did not answer the question, thus reducing the representativeness of the results. Finally, our study did not combine the demographic data with the STI testing results. Thus, risk factors for specific STI infections among the study population were not investigated. However, the purpose of this study was not to study risk factors for specific STIs but to investigate patient characteristics and demographics.

In conclusion, this study adds to the knowledge about the sexual behavior profile of STI clinic attenders in a general Finnish population. The typical patient visiting STI clinic in our population was a young woman without any STI symptoms. Some specific risky behavior factors were also seen in the study, such as low condom use and a rather high number of sex partners. Increasing knowledge about the factors and history of sexual behavior in those seeking STI testing may guide organizing STI testing for those willing to be tested. Fluent possibilities for STI testing further prevent STIs. In the future, it would be interesting and important to combine the socioeconomic factors with our findings.

AUTHOR CONTRIBUTIONS

Iiro Repo: Data curation; investigation; writing—original draft. **Atte Sopenlehto:** Data curation; investigation; writing—original draft. **Laura Huilaja:** Conceptualization; project administration; supervision; writing—review & editing. **Jari Jokelainen:** Formal analysis; methodology; software; visualization. **Eetu Kiviniemi:** Formal analysis; methodology; software; visualization. **Suvi-Päivikki Sinikumpu:** Conceptualization; project administration; supervision; writing—review & editing.

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CONFLICT OF INTEREST STATEMENT

The authors report there are no competing interests to declare.

DATA AVAILABILITY STATEMENT

Based on approval available from Hospital archives.

ETHICS STATEMENT

Ethics committee approval was not required since the study was retrospective and based on medical records only.

TRANSPARENCY STATEMENT

The lead author Suvi-Päivikki Sinikumpu affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

ORCID

Suvi-Päivikki Sinikumpu  <http://orcid.org/0000-0001-6496-5475>

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