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Sexually transmitted diseases testing and counseling practices among primary care physicians in Croatia

Testiranje i savjetovanje o spolno prenosivim bolestima u praksi liječnika primarne zdravstvene zaštite u Hrvatskoj

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Summary

Aim: To assess sexually transmitted disease (STD) testing, counseling practices, and knowledge among general practitioners (GPs) in Croatia.

Methods: A cross-sectional, anonymous online survey was conducted from December 2021 to January 2022 among GPs. The 32-item questionnaire examined demographic characteristics, clinical practices, attitudes, and knowledge regarding STD testing, treatment, HIV prevention, and guidelines familiarity.

Results: A total of 230 GPs (81.3% female) participated. HIV testing was rarely recommended (median 0 in the previous 3 months), while STD testing was infrequent (median 3). Nearly half GPs reported barriers to STD counseling, most commonly insufficient time and discomfort while only 15.2% were familiar with STD guidelines. Knowledge gaps were observed, particularly in gonorrhea treatment (12.6% correct) and empiric treatment of urethritis (17.0% correct). Awareness of PEP (53.1%) exceeded that of PrEP (39.6%).

Conclusion: Croatian GPs demonstrate limited engagement and knowledge gaps in STD management, highlighting the need for targeted education and clearer clinical guidance.

Sažetak

Cilj: Procijeniti prakse testiranja i savjetovanja te razinu znanja o spolno prenosivim bolestima (SPB) liječnika opće/obiteljske medicine u Hrvatskoj.

Metode: Od prosinca 2021. do siječnja 2022. godine provedeno je anonimno presječno istraživanje među liječnicima opće/obiteljske medicine. Online upitnik s 32 pitanja obuhvaćao je demografska obilježja ispitanika, kliničku praksu, stavove i znanje o testiranju i liječenju spolno prenosivih bolesti, prevenciji infekcije HIV-om te poznavanju stručnih smjernica.

Rezultati: U istraživanju je sudjelovalo 230 liječnika opće/obiteljske medicine (81,3% žena). Testiranje na HIV se rijetko preporučivalo (medijan 0 u prethodna tri mjeseca), dok se testiranje na SPB provodilo povremeno (medijan 3). Gotovo polovica ispitanika navela je razne prepreke u savjetovanju o spolno prenosivim bolestima, pri čemu su najčešće istaknuti nedostatak vremena i osjećaj nelagode. Samo 15,2% ispitanika odgovorilo je da su upoznati sa smjernicama za liječenje SPB. Uočeni su značajni nedostaci u znanju, osobito u području liječenja gonoreje (12,6% točnih odgovora) i empirijskog liječenja uretritisa (17,0% točnih odgovora). Ispitanici su bili bolje upoznati s postekspozicijskom profilaksom (PEP) (53,1%) nego s predekspozicijskom profilaksom (PrEP) (39,6%).

Zaključak: Liječnici opće/obiteljske medicine u Hrvatskoj pokazuju ograničenu uključenost te nedostatke u znanju o zbrinjavanju spolno prenosivih bolesti, što upućuje na potrebu za ciljanim edukacijskim programima i jasnijim kliničkim smjernicama.

Introduction

Sexually transmitted diseases (STDs) are infections transmitted through sexual activity that can have a profound impact on sexual and reproductive health and thus represent a major public health problem. Ac-

cording to the World Health Organization (WHO), more than one million STDs are acquired worldwide every day. Even though Europe has significantly lower incidence than world's average, every year there

are more than 500 000 cases reported in the EU/EEA and the United Kingdom^[1]. Between 2014 and 2023, notifications of gonorrhea, syphilis, and chlamydia among men who have sex with men (MSM) in EU/EEA countries reported to the European Centre for Disease Prevention and Control (ECDC) increased by approximately 300%, 90%, and 180%, respectively. Among heterosexual men and women, the most pronounced increase was observed in young women, with gonorrhea notification rates rising by nearly 200% among those aged 20–24 years between 2021 and 2023^[2]. HIV/AIDS surveillance in Europe for 2022 reports that HIV infection affects more than 2.3 million people in the WHO European Region, mostly in the Eastern part. In 2022, there were nearly 107 000 people newly diagnosed with HIV, including about 17 000 cases in the EU/EEA^[3]. A nationwide study in Croatia estimated the prevalence of syphilis among males living with HIV, comparing data from pre-COVID-19 and COVID-19 years. There was a 91.4% increase in the incidence from 2019 to 2020^[4]. There likely exists a problem of underreporting of cases in the official data. Data for the Croatian population in the period from 2017 to 2021 suggest that the average annual number of newly reported cases was 300 for chlamydial infections, 40 for syphilis and 20 for gonorrhea, with most cases diagnosed in younger population. Although Croatia has a relatively low HIV incidence, approximately 90 new HIV cases are diagnosed each year, predominantly among the MSM population^[5].

The appropriate and most efficient approach to reduce STDs is prevention and early intervention. In Croatia, as in many other countries, general practitioners (GPs) should be the first point of contact when seeking healthcare advice. They should recognize if a person is at high risk for acquiring STDs and focus on prevention, including informing patients about pre-exposure (PrEP) and post-exposure prophylaxis (PEP). The role of GPs in the management of STDs varies according to availability of sexual and reproductive health services. However, considering that the incidence of STDs is rising globally, it is important to identify problems that primary care is facing to increase the efficiency of their work in this field.

A survey among GPs in Switzerland showed that only 48% of questioned GPs stated that they considered offering advice about HIV prevention to be an important intervention and only one third feels comfortable discussing it. Still, most of them spontaneously give advice regarding STDs during a routine consultation^[6]. Similar conclusions were made based on studies about PrEP prescription rate in GPs office in the USA. Centers for Disease Control and Prevention

(CDC) estimate that of the 1.2 million persons who could benefit from PrEP, and only 25% had been prescribed PrEP in 2020. This is particularly concerning in non-urban areas where HIV diagnosis is established in the later stage of the infection. Studies have shown that the largest barrier to prescribing PrEP is lack of training and education, and lack of clinic guidelines and protocols^[7]. Study from Washington DC, where prevalence of HIV is 1.7%, less than 50% of GPs that have been interviewed ask their patients about sexual habits, and less than 30% about drug use^[8].

In this study, we investigated STD-related testing and counseling practices and attitudes among GPs in Croatia via online survey.

Participants and methods

Study design

A survey was conducted among general practice/family medicine physicians in Croatia from December 2021 to January 2022. GPs from all parts of Croatia were invited. Data were collected via a self-administered, 32-questions survey and took approximately 15 minutes to complete. Survey was pretested with 10 GPs and corrections were made to enhance comprehension. Survey intentions were explained upon questionnaire distribution. Participation was voluntary and anonymous. In December 2021, questionnaires were emailed to physicians working in family medicine practice using contact information from the membership database of the Croatian Family Physicians Coordination, the largest professional association of GPs in Croatia. According to the Croatian Health Insurance Fund, there are 2,321 physicians providing healthcare in general/family medicine practices in Croatia^[9].

Questionnaire

A 32-point questionnaire made by the authors was used. The first part of the questionnaire investigated socio-demographic characteristics of the participants: age, gender, years of experience, specialty and location of practice. The second part of the questionnaire addressed physicians' experience with testing for HIV, testing and treatment of STDs, LGBT+ sexual health consultations, attitudes and satisfaction about their knowledge of diagnosing and treating STDs, awareness of PrEP and PEP for HIV, and opinion of COVID-19 influence on testing/treatment of STDs. Finally, the third part of the questionnaire was based on STD guidelines (World Health Organization, International Union Against Sexually Transmitted Infections, Centers for Disease Prevention and Control) and aimed to evaluate the knowledge of therapeutic ap-

proach to particular STDs, partner notification and indication for HIV test^[10-12].

Statistical analysis

Descriptive analysis of the sample was conducted. Results were expressed as percentages for categorical

variables and median with first and third quartile for continuous variables. The outcomes regarding knowledge were described as correct answers with absolute numbers and percentages. Between-group comparisons were conducted using the t-test, with other statistical tests applied as appropriate based on data distribution and variable type. P-value of less than 0.05 was

TABLE 1. CHARACTERISTICS OF CROATIAN GENERAL PRACTITIONERS WHO RESPONDED TO SURVEY (N=230)

TABLICA 1. OBILJEŽJA LIJEČNIKA OPĆE/OBITELJSKE MEDICINE U HRVATSKOJ UKLJUČENIH U ISTRAŽIVANJE (N=230)

Characteristics	N (%)
Sex	
Female	187 (81.3)
Male	43 (18.7)
Age group, years	
24-29	49 (21.3)
30-39	76 (33.0)
40-49	29 (12.6)
50-59	51 (22.2)
60-65	22 (9.6)
>65	3 (1.3)
Formal education	
Medical doctor without specialty training	93 (40.4)
Family medicine specialist	88 (38.3)
Family medicine resident	33 (14.3)
Other medical specialties	9 (4.0)
Other medical residencies	7 (3.0)
Professional experience, years	
0-5	76 (33.0)
6-10	37 (16.1)
11-15	19 (8.3)
16-20	17 (7.4)
>20	81 (35.2)
Practice location	
Urban agglomeration (centre in Zagreb, Split, Rijeka and Osijek)	96 (41.7)
Larger urban area (>35 000 inhabitants)	35 (15.2)
Smaller urban area (10 000-35 000 inhabitants)	42 (18.3)
Rural area	57 (24.8)

Values are frequencies and percentages in parenthesis.

considered as statistically significant. The results were analyzed using SAS (version 9.4, SAS Institute, Cary, North Carolina, USA).

Results

A total of 230 GPs answered the survey, 187 of whom were female (81.3%). More than half of the total number of respondents were younger than 40 years of age (125; 54.3%). The majority were medical doctors without any specialty training (93; 40.4%). More than third (81; 35.2%) had over 20 years of work experience. Further details regarding characteristics of GPs who responded the survey are shown in Table 1.

Results of the survey showed that in the last 3 months GPs recommended HIV test in median of 0

(Q1-Q3: 0-1) patients and other STDs test in 3 (Q1-Q3: 1-5) patients (Table 2). Half of the respondents reported that they have experience with LGBT+ sexual health counseling less than once a month (117; 50.9%). Half of GPs (114; 49.6%) also reported to have barriers in STDs counselling, with insufficient time as a most common barrier (77; 33.5%). Of all STDs, chlamydia and gonorrhea were treated in most of the cases (99; 43.0%) by GPs themselves and less than half (89; 38.7%) assume that treating STDs should be in GPs domain. Only 35 (15.2%) were familiar with STD treatment guidelines (WHO, IUSTI or CDC) and 89 (38.7%) learned about STDs outside their formal education (Table 2).

Results of the survey showed that physicians are more informed about PEP (53.1%) than about PrEP

TABLE 2. CROATIAN GENERAL PRACTITIONERS' (GPs) EXPERIENCE IN SEXUALLY TRANSMITTED DISEASES (STDs) TESTING AND OPINIONS ABOUT STDs TREATMENT APPROACH (N=230)

TABLICA 2. ISKUSTVA LIJEČNIKA OPĆE/OBITELJSKE MEDICINE U HRVATSKOJ U TESTIRANJU NA SPOLNO PRENOSIVE BOLESTI TE STAVOVI O NJHOVU LIJEČENJU (N=230)

	median (Q1-Q3)
Number of HIV test recommendations in the past 3 months	0 (1-5)
Number of STD test recommendations in the past 3 months	3 (1-5)
	N (%)
LGBT+ sexual health counselling	
at least once a week	3 (1.3)
at least once a month	17 (7.4)
less than once a month	117 (50.9)
Never	93 (40.4)
Consider to have enough knowledge and skills to diagnose STDs	
strongly disagree	6 (2.6)
somewhat disagree	33 (14.3)
neither agree nor disagree	81 (35.2)
somewhat agree	102 (44.4)
strongly agree	8 (3.5)
Consider to have enough knowledge and skills to treat STDs¹	
strongly disagree	5 (2.2)
somewhat disagree	44 (19.1)
neither agree nor disagree	88 (38.3)
somewhat agree	86 (37.4)
strongly agree	7 (3.0)

Have barriers in STDs counselling	
never	30 (13.0)
rarely	71 (30.9)
sometimes	114 (49.6)
usually	13 (5.6)
always	2 (0.9)
Barriers to STDs counselling	
insufficient time	77 (33.5)
insufficient knowledge	32 (13.9)
feeling uncomfortable	77 (33.5)
something else	13 (5.6)
no barriers	31 (13.5)
Treating patients diagnosed with chlamydia and gonorrhea by themselves	99 (43.0)
Treating patients diagnosed with syphilis by themselves	13 (5.6)
Treating patients diagnosed with genital HSV by themselves	43 (18.7)
Learning about STDs outside the formal education	89 (38.7)
Satisfaction with current STDs knowledge	
very satisfied	2 (0.9)
somewhat satisfied	67 (29.1)
neither satisfied nor dissatisfied	120 (52.2)
somewhat dissatisfied	37 (16.1)
very dissatisfied	4 (1.7)
Familiar with STDs treatment guidelines (WHO/IUSTI/CDC)	35 (15.2)
Consider that COVID-19 pandemic had a negative impact on diagnosing STDs	135 (58.7)
Consider that COVID-19 pandemic had a negative impact on treating STDs	120 (52.2)
Consider that diagnosing and treating STDs¹ have to be in GPs domain	89 (38.7)

¹ not including HIV, HCV and HBV; LGBT+, lesbian, gay, bisexual and transgender/transsexual people; WHO (World Health Organization); IUSTI (International Union Against Sexually Transmitted Infections); CDC (Centers for Disease Control and Prevention)

(39.6%), but not all of them knew where to refer a patient to receive PEP (Table 3). Less than 1/5 of GPs would choose the right empiric combination of antibiotics to treat urethritis among proposed options. The

majority of respondents would choose the right treatment for syphilis and chlamydia, but only 12.6% knew how to treat gonorrhea. Detailed results on the knowledge of STDs are given in Table 3.

TABLE 3. GENERAL PRACTITIONERS' KNOWLEDGE OF SEXUALLY TRANSMITTED DISEASES (STDs) (N=230)

TABLICA 3. ZNANJE LIJEČNIKA OPĆE/OBITELJSKE MEDICINE O SPOLNO PRENOSIVIM BOLESTIMA (N=230)

Would offer HIV test to a patient diagnosed with STD	115/191 (60.2%)
Familiar with pre-exposure prophylaxis (PrEP) for HIV	76/192 (39.6%)
Familiar with post-exposure prophylaxis (PEP) for HIV	102/192 (53.1%)
Know where to refer a patient for PrEP	78/177 (44.1%)
Know where to refer a patient for PEP	90/177 (50.8%)
Would treat sexual partner of a patient diagnosed with STD	169/190 (88.9%)
The best choice of empiric treatment for urethritis among proposed	
<i>ciprofloxacin + azithromycin</i>	116/230 (50.4%)
<i>co-amoxiclav + doxycycline</i>	58/230 (25.2%)
<i>cefixime + doxycycline*</i>	39/230 (17.0%)
<i>cefixime + co-amoxiclav</i>	17/230 (7.4%)
The best choice of treatment for chlamydia among proposed	
<i>doxycycline*</i>	182/230 (79.1%)
<i>ciprofloxacin</i>	18/230 (7.9%)
<i>cefixime</i>	15/230 (6.5%)
<i>co-amoxiclav</i>	15/230 (6.5%)
The best choice of treatment for gonorrhea among proposed	
<i>benzathine penicillin G + azithromycin</i>	106/230 (46.1%)
<i>ciprofloxacin</i>	63/230 (27.4%)
<i>cefixime +/- azithromycin*</i>	29/230 (12.6%)
<i>doxycycline</i>	32/230 (13.9%)
The best choice of treatment for syphilis among proposed	
<i>benzathine penicillin G*</i>	206/230 (89.6%)
<i>erythromycin</i>	10/230 (4.3%)
<i>ciprofloxacin</i>	9/230 (3.9%)
<i>azithromycin</i>	5/230 (2.2%)

*correct answers (the total number of responses is sometimes less than 230, as some participants did not complete all questions)

There were no significant differences between female (N=187) and male (N=43) physicians in reporting to never having faced barriers to STD counseling (24 [12.8%] vs. 6 [13.9%], $p=0.84$), in treating patients with diagnosed chlamydia and gonorrhea (80 [42.8%] vs. 19 [44.2%], $p=0.86$), syphilis (9 [4.8%] vs. 4 [9.3%], $p=0.25$), or genital HSV (34 [18.2%] vs. 9 [20.9%], $p=0.67$). Female GPs were more likely to select the correct proposed treatment for syphilis (178 [95.2%] vs. 28 [65.1%], $p<0.001$) and chlamydia (155 [82.9%] vs. 27 [62.8%], $p=0.004$). However, no significant differences were found in selecting the correct proposed treatment for gonorrhea (23 [12.2%] vs. 6

[13.9%], $p=0.77$) or empiric treatment for urethritis (34 [18.2%] vs. 5 [11.6%], $p=0.30$). Familiarity with STD treatment guidelines and engagement in learning about STDs outside formal education were comparable between groups (female vs. male: 28 [15.0%] vs. 7 [16.3%], $p=0.83$; and 75 [40.1%] vs. 14 [32.6%], $p=0.36$, respectively).

When compared according to professional experience: ≤ 10 years (N=122) vs. >10 years (N=108) there were no significant differences in never facing barriers in STDs counselling among less and more experienced physicians (15 [12.3%] vs. 15 [13.9%], $p=0.719$), treating patients diagnosed with syphilis (6 [4.9%] vs.

7 [6.5%], $p=0.61$) and genital HSV (27 [22.1%] vs. 16 [14.8%], $p=0.1556$) by themselves. More experienced physicians were treating chlamydia and gonorrhea by themselves more frequently (57 [52.8%] vs. 42 [34.4%], $p=0.005$). More experienced GPs were better in choosing correct proposed empiric treatment for urethritis (24 [22.2%] vs. 15 [12.3%], $p=0.045$), chlamydia (103 [95.4%] vs. 79 [64.8%], $p<0.001$) and syphilis (105 [97.2%] vs. 101 [82.8%], $p<0.001$). No significant difference was observed in choosing the right proposed treatment for gonorrhea (17 [15.7%] vs. 12 [9.8%], $p=0.177$) and in familiarity with STD treatment guidelines (15 [13.9%] vs. 20 [16.4%], $p=0.596$).

Discussion

This study showed that GPs in Croatia rarely recommend HIV testing, many face barriers in STD counselling, do not feel responsible for STDs management, and are unfamiliar with STDs treatment guidelines. Most common barriers to providing STDs care were time constraints and feeling uncomfortable discussing sexual history. In previous studies time has also been reported as the main barrier^[13-15]. Furthermore, previous findings indicate that the lack of time decreases adherence to clinical guidelines and lowers the probability of conducting sexual risk assessments and offering HIV test^[16-18]. Currently, there aren't any time-saving tools available to Croatian GPs in the context of STDs care. Such tools have already been successfully implemented elsewhere and include the use of the patient-administered computer or paper-based questionnaires^[19,20]. Besides being time saving, this approach could also result in more detailed information collection, especially sensitive information that makes patients or physicians feel uncomfortable. One-third of GPs in our study reported this as a barrier.

Contrary to some other studies that listed the lack of STD training and knowledge among top barriers, here only 13.9% of GPs reported insufficient knowledge as a barrier^[13,17-18]. In addition, almost half respondents consider having enough knowledge to manage STDs. When considered alongside the very low proportion of respondents familiar with STD treatment guidelines (15.2%) and the low proportion of those who selected the correct treatment option for urethritis (17%) or gonorrhea (12.6%), these findings suggest that participants may have overestimated their knowledge. Less experienced physicians who had completed their formal education more recently were less likely to choose the recommended treatment options for urethritis, chlamydia and syphilis, and were equally unfamiliar with the treatment guidelines or gonorrhea treatment as their more experienced counterparts. It seems GPs

derive their knowledge and skills more from their clinical experience rather than formal education. Only about one-third (38.7%) of respondents learned about STDs outside formal education. All that underscores the need to significantly improve STD training during medical school and residency, and to place stronger emphasis on existing guidelines, especially for gonorrhea. Additional efforts should be undertaken to offer more STD training courses (as a part of continuous medical education - CME) that would specifically target GPs.

More than half of GPs do not feel that STD management should be in their domain. The reason behind that could be the fact that STD care is highly dispersed between different specialties including dermatovenereology, gynecology and infectious diseases. Also, there are no national guidelines or recommendations on STD prevention, screening, or treatment that formally define the role of primary care physicians. The sense of responsibility could potentially be increased by changing that practice. In a study from Singapore, almost half GPs did not investigate genital discharge in patients with genital discharge^[21]. In contrast, Swiss GPs diagnose the majority of gonorrhea and syphilis cases and 80% consider STD prevention a regular part of their practice^[6].

Recent studies demonstrated that GPs could have an important role in providing PrEP services and could increase its uptake that is currently lacking on a global scale^[23-25]. In Croatia, PrEP became available in 2018 and is provided free of charge. GPs can refer their patients for PrEP based on the sexual risk assessment or upon the patient's own request. Currently PrEP is available in Zagreb (University Hospital for Infectious Diseases) and Split (University Hospital of Split). Around 2/5 of respondents knew about PrEP and where to refer patients. We find this percentage unsatisfactory. In order to increase PrEP awareness, GPs should be provided with more information on PrEP and its high efficacy in preventing HIV. For example, this could be done by providing targeted educational materials and courses (on-line and in-person). A potential obstacle to PrEP utilization could be that 2/5 of respondents never provide LGBT+ sexual health counseling and a similar number wouldn't offer HIV testing to a patient diagnosed with STD. Such practice diminishes the opportunity to recognize potential PrEP candidates and to diagnose HIV infection early^[26]. Croatia still has a high proportion of late presenters to HIV care^[27].

Several studies reported more positive attitudes of female physicians and them being more likely to conduct a sexual risk assessment and provide screening or other preventive services^[28]. Reasons behind that are

not exactly clear, but females may be more sensitive to STDs issues, more adherent to guidelines, and they tend to engage in more patient centered communication. Our results showed that female GPs were more likely to select the correct treatment for syphilis and chlamydia, while no other differences were identified. The limited proportion of male physicians in our study population may partly explain these findings.

Study limitations

As this was a voluntary, survey-based study, we cannot be certain that our sample is fully representative of the entire GP population in Croatia. However, GPs from different regions of Croatia participated in the survey, and currently no other data are available on this topic for comparison. Furthermore, the behaviors and attitudes expressed by GPs were self-reported, which may introduce reporting bias, as participants may have under-reported or over-reported their practices and attitudes. Additionally, non-respondents may have differed from respondents in their behaviors or attitudes, potentially introducing non-response bias.

Conclusions

In conclusion, this is the first cross-sectional survey on STD testing and counseling practices among primary care physicians in Croatia. Our study identified and discussed several barriers to STD care. Results of the study can be used to design interventions to improve physicians' skills and sense of responsibility for STD management. According to the ECDC, countries should establish a national strategy for the prevention and control of STDs. Such frameworks may be standalone or integrated within broader public health strategies; however, standalone STD action plan is recommended to ensure sufficient focus on this matter^[2]. In this context, Croatia does not have a unified and comprehensive national STD strategy. Although elements of STD prevention are included within broader health policy frameworks, there is an absence of a clearly defined national STD strategy plan. This gap may also be relevant for GPs, as clearer national guidance and defined priorities could strengthen their engagement and clarify their role.

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