

Knowledge of women who have sex with women about Sexually Transmitted Infections and AIDS

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Abstract *This article aims to study the knowledge of women who have sex with women about Sexually Transmitted Infections and AIDS. Cross-sectional study of 260 women, 81 women who either have sex with women or with men and women (WSW) and 179 women who have sex exclusively with men (WSM). Data were collected in 2019/2020 by means of a form and validated instruments. To study the association between sexual partnership and level of knowledge about Sexually Transmitted Infections and AIDS, multiple Cox regression models were adjusted, producing significant associations of $p < 0,05$. The median percentage of correct answers was lower among WSW when compared to WSM [68% (18-96) vs 75% (14-96); $p = 0.023$]. Having sex with woman [PR=2.36 (1.07-5.21); $p = 0.033$] and less than 11 years of schooling [PR=2.64 (1.12-6.21); $p = 0.026$] were independently associated with low knowledge. WSW had a lower level of knowledge about Sexually Transmitted Infections and AIDS than WSM, and lower education was independently associated with this finding.*

Key words *Knowledge, Sexually Transmitted Infections, AIDS, Female homosexuality*

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Introduction

In Brazil, women's reproductive rights started to become recognized from 1984 due to the launch of the Comprehensive Women's Health Care Program (PAISM)¹. It proposed a comprehensive approach to women that included lifelong health prevention, promotion and recovery actions, breaking with the care model that had been centered on the pregnant-puerperal cycle, thus representing the demands consolidation of social and feminist movements in that historical context².

Despite advances in women's health, some shortcomings were identified and reviewed in 2003 by the National Policy for Integral Attention to Women's Health (PNAISM), which proposed new actions, such as the inclusion of lesbian women³. In 2011, lesbian and bisexual women's rights were acknowledged by the National Policy for the Integral Health of Lesbians, Gays, Bisexuals, Transvestites and Transsexuals (PNSILGBT)⁴.

Although advances in public policies aimed at the lesbian, gay, bisexual, transvestite and transsexual (LGBT) population, both Brazilian^{5,6} and international^{7,8} studies report that health professionals are having difficulties in dealing with this group due to the dominant culture of heteronormativity^{5,9}. As for women who have sex with women (WSW), difficulties range from accessing health centers to obtaining health care⁹⁻¹¹, as their sexual orientation is still widely ignored.

Brazilian¹²⁻¹⁴ and international¹⁵⁻¹⁷ studies that address knowledge and practices aimed at prevention and factors associated with sexually transmitted infections and AIDS (STI/AIDS) among WSW point to insufficient levels of knowledge, increasing their risk of infection. Although this is not the only determinant, the lack of discussions and access to information on sexual health is associated with that negative outcome, whereas its presence is an important element to adopt safer sexual behavior¹⁸.

Evaluating knowledge on STI/AIDS is essential for the development of health interventions and policies and to facilitate future studies on that topic, the present study used the Sexually Transmitted Disease - Knowledge Questionnaire (STD-KQ)¹⁹, which was validated and adapted to Portuguese to measure knowledge about STI. It is the only questionnaire that analyzes not only the vertical transmission of some infections, but also prevention and protection measures against transmission²⁰.

Considering that WSW are vulnerable to STI²¹ and that literature, especially the Brazilian

one, is incomplete on the knowledge of this population about these infections, we propose this research, which aims to study the knowledge of WSW about STI/AIDS.

Method

We performed a cross-sectional study that is part of a broader research on vulnerability of WSW to issues related to mental, sexual and reproductive health and situations of violence in the city of Botucatu, located in the midwestern region of the State of São Paulo.

The target population of the study consisted of women aged 18 years or older and sexually active, excluding those who were not physically and/or mentally able to answer the questions of the data collection instruments.

Data were obtained from May 2019 to November 2020. To obtain our sample, the study was widely shared on social networks (Facebook, email, Instagram, WhatsApp), in bars, various commercial locations and educational and health institutions by means of posters and leaflets/invitation entitled "Taking care Women's Health - a project aimed at women who have sexual relations with women, with men and with both women and men" and that included the researchers' contacts and social network pages (@cuidandodamulher19, cuidandodamulher19@gmail.com, pcsaudedamulher2019). Regarding WSW, dissemination was intensified among LGBT activism groups and participants from previous studies²². As a result, women interested in participating in our study contacted us to find out more about our research goals and how to participate.

The sample eventually consisted of 260 women of which 81 had either sex with women or with men and women (WSW) and 179 had sex exclusively with men (WSM).

The adoption of the WSW nomenclature is justified if we consider the diversity of sexual practices among women, regardless of their sexual orientation and identity, which requires that STI/AIDS prevention actions in this population prioritize their sexual history. Therefore, research on STI and WSW^{11-14,16,17} has used this term to compare studies over time without neglecting the historical struggle of lesbian and bisexual women for their rights and inclusion in public and identity policies.

To collect data, we used a form of questions related to sociodemographic variables, substance consumption, sexual and protective behavior/

practices, clinical conditions, and access to health centers. We also applied the following validated instruments: the Sexually Transmitted Diseases - Knowledge Questionnaire (STD-KQ)¹⁹, the Alcohol Use Disorder Identification Test (AUDIT)²³ and the Self-Reporting Questionnaire (SRQ-20)²⁴.

The form was developed for the main research and contains open and closed questions. It was submitted to experts in women's and mental health who analyzed its clarity and contents, including one woman who has sex with woman. It was tested with women who were not part of the sample, and no changes were deemed necessary.

STD-KQ¹⁹ is a validated instrument that was developed in the U.S.A. by Jaworski and Carey in 2007 to assess knowledge about STIs and HIV/AIDS. The original version contains 27 items related to knowledge about HIV/AIDS, hepatitis B, human papillomavirus (HPV), genital herpes, chlamydia and gonorrhea and was adapted to Brazilian Portuguese in 2015²⁰. One question about the use of lambskin condoms was removed and two questions about syphilis, a highly prevalent disease in Brazil, were included. The questionnaire can be self-administered and consists of 28 items that need be categorized as either "true", "false" or "I don't know". The result is calculated by adding the correct answers, each of which counts one point, resulting in a maximum score of 28 points.

AUDIT²³ identifies reliable and standardized information on problematic alcohol consumption. It contains 10 questions about alcohol consumption in the 12 last months regarding quantity and frequency, dependence and consequences, its top score is 40 points. In our study, risk consumption was defined by a score equal to or greater than eight points.

The SRQ-20²⁴ is a screening questionnaire for Common Mental Disorders (CMD) used to assess general mental health conditions, such as anxiety, insomnia, and other symptoms of psychological distress. It consists of 20 questions of binary-type answers (yes/no, scoring 1 and 0, respectively). Women who scored 8 or more points are considered having some kind of CMD.

The data collection team consisted of three postgraduate nurses, including the first author, who were properly trained to apply the data collection instruments. Data collection took place at the Auxiliary Unit of the School of Medicine of Botucatu with 225 subjects until March 2020. It was interrupted due to the COVID-19 Pandemic and the remaining 35 subjects were interviewed

between October and November 2020, as we were allowed to resume our research by complying with all health protection measures aimed at participants. Data collection lasted approximately 30 minutes per subject.

The outcome studied was the low level of knowledge about STI/AIDS (yes/no), which was the case when the correct percentage of the STD-KQ¹⁹ was below 50%.

The independent variable was the type of sexual partner (either WSW or WSM).

The following covariates were examined: age in years (18-21, 22-29, ≥ 30); self-reported skin color (white, non-white); full years of schooling (≤ 11 years and ≥ 12 years); marital status (together, not together); religion (yes/no); per capita family income in Brazilian Reals (BRL); paid professional activity (yes/no); tobacco use (yes/no); illicit drug use (yes/no); alcohol abuse (AUDIT²³ ≥ 8 points, < 8 points); number of sexual partners in the last three months (0, 1, ≥ 2); use of sex accessories (yes/no), consistent use of condoms in penetrative practices (in all vaginal and/or anal intercourses) (yes/no); use of hormonal contraceptives (yes/no); common mental disorder (SRQ-20²⁴ ≥ 8 points, < 8 points); opportunity to ask questions about STI/AIDS at health centers (yes/no); has received information on STI/AIDS prevention at a health center (yes/no); knows the female condom (yes/no); where they obtain information about STI/AIDS (media/formal education/family, friends, work/health center), had a gynecological visit in the 12 months prior to data collection (yes/no), obtained free condoms at health centers or at other locations (yes/no).

Data were coded and typed twice in a MS Excel® spreadsheet. Inconsistencies forced us to revise the instrument and to make the required corrections in the database. Data were made available after that.

The descriptive study of the categorical variables was based on the frequency distribution and the quantitative numerical variables, on measures of position and dispersion and, in the comparison of the groups, on the Chi-square and Fisher's Exact tests. Multiple Cox regression models were adjusted to define the association between the type of sexual partner and the low level of knowledge about STI/AIDS, by including in the deterministic component of the models the most strongly associated variables ($p < 0.20$), which were identified by means of a bivariate analysis. In the final model, associations were considered statistically significant if $p < 0.05$. Analyses were performed using the Statistical Pack-

age for the Social Sciences (SPSS 21) software program.

The research project was submitted and approved by the Research Ethics Committee of the School of Medicine of Botucatu, Universidade Estadual Paulista "Júlio de Mesquita Filho" and received a favorable verdict (No. 3.320.951). All participants were duly informed about the goals and ways of participation and the subjects who agreed to participate signed the Free and Informed Consent Term. After data collection, we provided guidance to women who lacked information or had questions about STI/AIDS.

Results

Women were 26 years old (18-50) on average and their per capita family income BRL 1,666.66 (BRL 223.30-BRL 15,000.00), respectively (data not shown in tables).

Most women were aged between 22 and 29 (43.5%), declared to be white (77.3%), had 12 or more full years of schooling (86.5%), were not in a relationship (77.3%), were religious (65.8%), had a gainful occupation (62.7%), had had a gynecological consultation in the 12 months prior to data collection (63.5%), clarified questions (56.5%) and received information about STI/AIDS at a health center (54.6%). 35.0% had used tobacco, 40.8% had used one or more illicit drugs, 42.3% had used alcohol abusively, and 16.9% used condoms consistently in penetrative practices (Table 1).

Among the 28 questions of the STD-KQ¹⁹, none of them was answered correctly by 100.0% of the women and no woman answered all the 28 questions of the instrument correctly. Questions whose percentage of correct answers was below 50% included: Frequent urinary infections are caused by Chlamydia (20.0%); Having anal sex increases a person's risk of getting Hepatitis (35.8%); It is easier to catch HIV if a person also has some other kind of STD (39.2%); A woman can tell by the way she feels her body if she has an STD (45.0%); A woman can look at her body and tell if she has Gonorrhea (45.8%); A person with Genital Herpes must have open wounds to pass on the infection to their sexual partner (48.1%) (Table 2).

The correct median percentage of the STD-KQ¹⁹ questions of WSW was lower than that of WSM [68% (18%-96%) vs 75% (14%-96%); $p=0.032$]. WSW also had a higher percentage of

poor knowledge level in relation to WSM (18.5% vs 7.8%, $p=0.038$) (data not shown in tables).

We observed that WSW had a lower percentage of correct answers than WSM regarding the following questions: HPV can lead to cancer in women (81.5% vs 92.7%, $p=0.007$); If a person has had Gonorrhea in the past, they are immune (protected) and cannot get infected again (67.9% vs 79.3%, $p=0.046$); Men can avoid getting Genital Warts by washing their genitals after sex (65.4% vs 79.3%, $p=0.017$); and Even if your partner has no lesions on their penis, anus or vagina, they may still infect you with syphilis (79.0% vs 92.2%, $p=0.002$) (Table 2).

The main sources of information on STI/AIDS cited by women were: mass media (74.2%), formal education (55.8%), health centers (54.5%) as well as family, friends and work (42.7%). It is noteworthy that a lower percentage of WSW received information from health centers compared to WSM (40.7% vs 60.9%, $p=0.003$) (Figure 1).

According to the bivariate analysis, variables most associated with poor knowledge about STI/AIDS ($p<0.20$) were non-white skin color [PR=1.79 (0.83-3.86); $p=0.135$]; less than 11 years of schooling [PR=3.92 (1.85-8.31); $p\leq 0.001$]; *per capita* family income [PR=1.00 (1.00-1.00); $p=0.148$]; illicit drug use [PR=0.55 (0.25-1.25); $p=0.154$]; use of hormonal contraceptives [PR=0.53 (0.22-1.23); $p=0.139$], clarified questions about STI/AIDS at health centers [PR=6.24 (2.38-16.37); $p=0.000$]; received information about STI/AIDS at health centers [PR=5.78 (2.20-15.14); $p=0.000$]; source of information on STI/AIDS by means of formal education and mass media [PR=2.80 (1.28-6.15); $p=0.010$], [RP=1.76 (0.83-3.73); $p=0.139$], respectively; and sexual partnership with women [PR=2.37 (1.14-4.91); $p=0.020$] (Table 3).

Table 4 presents the results of the Multiple Cox regression that investigated the variables that were associated with a low level of knowledge about STI/AIDS. The type of sexual partnership was independently associated with poor knowledge about STI/AIDS, where WSW showed a more than twofold increase in the prevalence of this outcome compared to WSM [PR=2.36 (1.07-5.21); $p=0.033$]. It was also observed that education was independently associated with a low level of knowledge about STI/AIDS: women having 11 years of schooling or less showed a two-and-a-half times higher prevalence of this outcome than those having 12 or more years of schooling [PR=2.64 (1.12-6.21); $p=0.026$] (Table 4).

Table 1. Sociodemographic features, substance use, sexual behavior/practices, clinics, and access to health centers by WSW and WSM (n=260). Botucatu, 2019-2020.

Variables	WSW (n=81)		WSM (n=179)		Total (n=260)	
	n	%	n	%	n	%
Age						
18-21	18	22.2	31	17.3	49	18.8
22-29	39	48.1	74	41.3	113	43.5
≥30	24	29.7	74	41.3	98	37.7
Skin color						
White	62	76.5	139	77.7	201	77.3
Non-white	19	23.5	40	22.3	59	22.7
Education						
≤11 years	9	11.1	26	14.5	35	13.5
≥12 years	72	88.9	153	85.5	225	86.5
Marital status						
Together	20	24.7	39	21.8	59	22.3
Not together	61	75.3	140	78.2	201	77.3
Religion	43	53.1	128	71.5	171	65.8
Gainful occupation	46	56.8	117	65.4	163	62.7
Tobacco use	44	54.3	47	26.2	91	35.0
Use of illicit drugs*	46	56.8	60	33.5	106	40.8
Abusive use of alcohol†	44	54.3	66	36.9	110	42.3
Sexual partnerships in the last 3 months						
0	5	6.2	20	11.2	25	9.6
1	52	64.2	123	68.7	175	67.3
≥2	24	29.6	36	20.1	60	23.1
Use of sex accessories	27	33.3	18	10.1	45	17.3
Consistent use of condoms‡ (n=254)	3	4.0	40	22.3	43	16.9
Use of hormonal contraceptives	12	14.8	86	48.0	98	37.7
Common Mental Disorder§	35	43.2	46	25.7	81	31.2
Gynecological consultation last 12 months	43	53.1	122	68.2	165	63.5
Questions about STI/AIDS were answered by HC	35	43.2	112	62.6	147	56.5
Got information about STI/AIDS at the HC	33	40.7	109	60.8	142	54.6
Received free condoms at the HC	22	27.2	58	32.4	80	30.8
Received condoms elsewhere#	10	12.3	20	11.2	30	11.5
Knows about the female condom	80	98.8	176	98.3	256	98.5

WSW=women who have sex with women or with men and women. WSM=women who have sex exclusively with men. STI=sexually transmitted infections. HC=health centers. *Marijuana, cocaine, other drugs; †AUDIT≥8; ‡Penetrative practices; §SRQ 20≥8; #Universities, parties, conventions.

Source: Authors.

Discussion

The present study identified an independent association between the type of sexual partner and a low level of knowledge about STI/AIDS, in which WSW showed worse results than WSM. The lowest level of education, less than 11 years

of study, was also associated with the result of our analysis. The study made it further possible to identify specific topics on STI/AIDS in which WSW showed greater lack of knowledge and the main sources from which they obtain information, as they had received less information in health centers than WSM.

Table 2. Ratio of correct answers on sexually transmitted infections and AIDS (STD-KQ) of WSW and WSM (n=260). Botucatu, 2019-2020.

Questions (STD-KQ)	WSW	WSM	Total		P
	n (%)	n (%)	n	%	
1. Genital Herpes is caused by the same virus as HIV	67 (82.7)	149 (83.2)	216	83.1	0.917
2. Frequent urinary infections can cause Chlamydia	14 (17.3)	38 (21.2)	52	20.0	0.461
3. There is cure for Gonorrhoea	62 (76.5)	135 (75.4)	197	75.8	0.845
4. It is easier to get HIV if a person has another STD	25 (30.9)	77 (43.0)	102	39.2	0.063
5. HPV is caused by the same virus that causes HIV	62 (76.5)	151 (84.4)	213	81.9	0.129
6. Having anal sex increases a person's risk of getting Hepatitis B	23 (28.4)	70 (39.1)	93	35.8	0.095
7. Soon after infection with HIV a person develops open sores on his or her genitals (penis or vagina)	59 (72.8)	142 (79.3)	201	77.3	0.247
8. There is cure for Chlamydia	54 (66.7)	133 (74.3)	187	71.9	0.205
9. A woman who has Genital Herpes can pass the infection to her baby during childbirth	53 (65.4)	137 (76.5)	190	73.1	0.062
10. A woman can look at her body and tell if she has Gonorrhoea	32 (39.5)	87 (48.6)	119	45.8	0.173
11. The same virus causes all the STD	74 (91.4)	170 (95.0)	244	93.8	0.261
12. HPV can cause genital warts	69 (85.2)	158 (88.3)	227	87.3	0.489
13. HPV can lead to cancer in women	66 (81.5)	166 (92.7)	232	89.2	0.007
14. A men must have vaginal sex to get genital warts	68 (84.0)	149 (83.2)	217	83.5	0.886
15. STD can lead to health problems that are usually more serious for men than in women	63 (77.8)	149 (83.2)	212	81.5	0.293
16. A woman can tell that she has Chlamydia if she has a bad smelling odor from her vagina	37 (45.7)	102 (57.0)	139	53.5	0.091
17. If a person tests positive for HIV the test can tell how sick the person will become	65 (80.2)	156 (87.2)	221	85.0	0.149
18. There is a vaccine available to prevent a person from getting Gonorrhoea	49 (60.5)	116 (64.8)	165	63.5	0.504
19. A woman can tell by the way her body feels if she has a STD	33 (40.7)	84 (46.9)	117	45.0	0.353
20. A person who has Genital Herpes must have open sores to give the infection to his or her sexual partner	44 (54.3)	81 (45.3)	125	48.1	0.175
21. There is a vaccine that prevents a person from getting Chlamydia	46 (56.8)	117 (65.4)	163	62.7	0.186
22. A man can tell by the way his body feels if he has Hepatitis B	51 (63.0)	132 (73.7)	183	70.4	0.078
23. If a person had Gonorrhoea in the past her or she is immune (protected) from getting it again	55 (67.9)	142 (79.3)	197	75.8	0.046
24. HPV can cause HIV	69 (85.2)	148 (82.6)	217	83.5	0.615
25. A man can protect himself from getting Genital Warts by washing his genitals after sex	53 (65.4)	142 (79.3)	195	75.0	0.017
26. There is a vaccine that can protect a person from getting Hepatitis B	71 (87.7)	148 (82.7)	219	84.2	0.308
27. Even if your partner doesn't have any injuries on penis, anus or vagina, he or she still may infect you with syphilis	64 (79.0)	165 (92.2)	229	88.1	0.002
28. Syphilis can hide in the body for years	60 (74.1)	146 (81.6)	206	79.2	0.168

STD-KQ=Sexually Transmitted Diseases-Knowledge Questionnaire. WSW=Women who have sex with women or with men and women. WSM=Women who have sex exclusively with men.

Source: Authors.

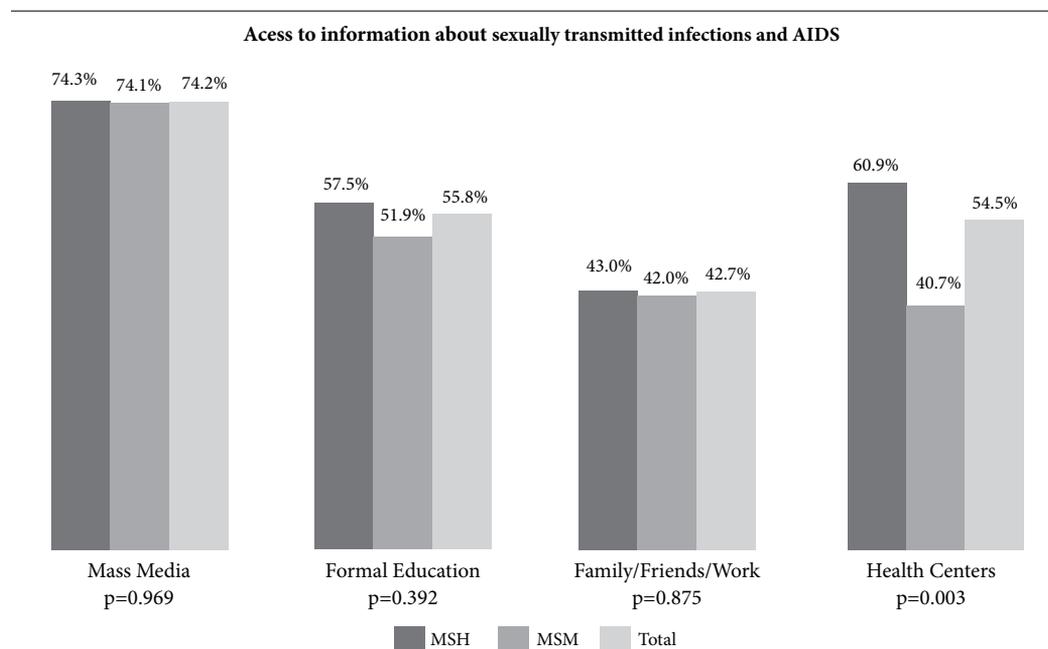


Figure 1. Source of information on STI/AIDS of WSW and WSM. Botucatu, 2019-2020.

Source: Authors

Table 3. Bivariate associations performed to explain the prevalence of poor knowledge about sexually transmitted infections and AIDS of WSW and WSM (n=260). Botucatu, 2019-2020.

Variables	PR	IC(95%)	P
Age			
18-21		1.0	0.269
22-29	1.84	(0.62-5.48)	0.271
≥30	1.00	(0.30-3.32)	1.000
Skin color			
White		1.0	
Non-white	1.79	(0.83-3.86)	0.135
Education			
≤11 years	3.92	(1.85-8.31)	<0.001
≥12 years		1.0	
Marital status			
Together		1.0	
Not together	1.08	(0.46-2.54)	0.853
Religion			
Yes		1.0	
No	0.61	(0.26-1.43)	0.257
Gainful occupation			
Yes		1.0	
No	0.76	(0.34-1.66)	0.486
Per capita family income	1.00	(1.00-1.00)	0.148
Tobacco use			
Yes	0.71	(0.31-1.60)	0.405
No		1.0	

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Table 3. Bivariate associations performed to explain the prevalence of poor knowledge about sexually transmitted infections and AIDS of WSW and WSM (n=260). Botucatu, 2019-2020.

Variables	PR	IC(95%)	P
Use of illicit drugs*			
Yes	0.55	(0.25-1.25)	0.154
No		1.0	
Abusive use of alcohol†			
Yes	1.46	(0.71-3.03)	0.308
No		1.0	
Common Mental Disorder			
Yes	0.84	(0.37-1.90)	0.679
No		1.0	
Use of hormonal contraceptives			
Yes	0.53	(0.22-1.23)	0.139
No		1.0	
Sexual partnerships in the last 3 months			
0		1.0	0.561
1	3.00	(0.40-22.30)	0.283
≥2	2.92	(0.36-23.71)	0.317
Use of sex accessories			
Yes	1.00	(0.38-2.61)	0.992
No		1.0	
Gynecological consultation last 12 months			
Yes		1.0	
No	1.41	(0.68-2.93)	0.356
Questions about STI/AIDS were answered by HC			
Yes		1.0	
No	6.24	(2.38-16.37)	0.000
Got information about STI/AIDS at the HC			
Yes		1.0	
No	5.78	(2.20-15.14)	0.000
Received free condoms at the HC			
Yes		1.0	
No	0.84	(0.39-1.82)	0.665
Received condoms elsewhere‡			
Yes		1.0	
No	1.13	(0.34-3.73)	0.841
Knows about the female condom			
Yes		1.0	
No	2.29	(0.31-16.80)	0.417
Source of information about STI/AIDS			
Formal Education	2.80	(1.28-6.15)	0.010
Media	1.76	(0.83-3.73)	0.139
Family/Friends/Work	1.66	(0.75-3.64)	0.209
Sexual partnership			
WSW	2.37	(1.14-4.91)	0.020
WSM		1.0	

WSW=Women who have sex with women or with men and women. WSM=Women who have sex exclusively with men. STI=Sexually transmitted infections. HC=Health Centers. *Marijuana, cocaine, other drugs; †AUDIT≥8; ‡Parties, universities, congresses.

Source: Authors.

Table 4. Multiple Cox regression of the association between sexual practice and poor knowledge about sexually transmitted infections and AIDS (n=260). Botucatu, 2019-2020.

	PR (IC95%)	p
Skin color		
White	1.0	
Non-white	1.30 (0.58-2.92)	0.516
Education		
≤11 years	2.64 (1.12-6.21)	0.026
≥12 years	1.0	
Per capita family income	1.00 (1.00-1.00)	0.618
Use of illicit drugs*	0.64 (0.26-1.56)	0.333
Use of hormonal contraceptives	0.76 (0.30-1.89)	0.564
Source of information about STI/AIDS		
Formal Education	1.93 (0.82-4.52)	0.131
Media	1.18 (0.53-2.59)	0.679
Sexual partnership		
WSW	2.36 (1.07-5.21)	0.033
WSM	1.0	

WSW=Women who have sex with women or with men and women. WSM=Women who have sex exclusively with men. STI= Sexually transmitted infections. *Marijuana, cocaine, other drugs.

Source: Authors.

Literature points out that the mere fact of being informed about STI/AIDS may not necessarily lead to applying preventive practices. However, lack of knowledge does increase vulnerability to these infections^{13,18,25,26}. As shown in these studies, lower education may influence access and understanding of information and consequent exposure to risk situations. Despite the fact that our sample was made up of women with a high educational level, findings show a three-times higher risk of poor knowledge about STI/AIDS among women with less than 11 years of schooling.

Lower education level associated with poor knowledge about STI/AIDS was also found in national²⁷⁻²⁹ and international^{30,31} studies that evaluated the general population, adolescents and a population deprived of freedom. Our study shows that more than twice as many WSW had a low level of knowledge about STI when compared with WSM and that having sex with a woman was independently associated with this finding.

In a recent study performed in Southern Africa¹⁷ with a sample of 591 WSW, 60.7% had never received any kind of information about STI/AIDS. Among those who had access to that kind of information, 70.6% had received it from LGBT organizations, 50.9% from pamphlets and flyers, 39.9% from friends, 31.6% from family members and the Internet. These data contrast with those obtained by our study in which the media, including the Internet, provided WSW with most information about STI/AIDS (74.1%), followed by formal education (51.9%), family/friends/work (42.0%) and health care professionals (40.7%). These data highlight the important role of discussions on sexual and reproductive health issues for the LGBT population, with a special focus on WSW, including training of health professionals and health centers to reduce health inequities.

The STD-KQ¹⁹ is a validated questionnaire that has been used in several countries and with different populations³²⁻³⁵. It was used for the first time by our study to assess knowledge of WSW, which is an opportunity to compare studies on similar topics in the future. Previous studies that used other knowledge measurement methods showed that WSW had insufficient levels of knowledge about STI/AIDS^{12,15-17}, which corroborates the findings of our study.

On the other hand, a Brazilian study that evaluated the knowledge of WSW about HIV/AIDS¹⁴ by means of an evaluative survey concluded that WSW had regular knowledge about that disease. However, use of protective measures was erratic, which is confirmed by our study, according to which 96.0% of WSW were not using condoms on a regular basis.

Our study detected some gaps in terms of knowledge about STIs, especially about forms of contamination and transmission of HPV, Gonorrhea and Syphilis. Knowledge about these infections is essential as it impacts the sexual and reproductive health of this population. Studies show a high prevalence of STIs, especially in WSW^{21,36}. Educational practices aimed at that group should therefore emphasize that kind of information, especially when larger gaps are detected.

It is noteworthy that in our study, only a small number of health professionals provided information on STI/AIDS and even less to WSW when compared to WSM. The same situation was found by an international study¹⁷, which might be due to their lack of preparation and difficulties in assisting women whose sexual practice depart from heteronormativity^{21,37,38}.

Health care environments are expected to welcome and offer care to everyone, to accept their singularities and pluralities and to be free from prejudices and stigmas. However, even today, people in homosexual relationships are often invisible and their specific care needs are often ignored^{39,40}. Studies have shown that the LGBT population has had less access to health centers^{40,41} and that most health professionals ignore their specific needs, perpetuating the wrong perception that there is a low transmission risk of STI/AIDS among WSW⁴². It has been shown by previous studies that an important factor associated with WSW's vulnerability to STI/AIDS is the low perception of risk, which increases the chance of contracting infections^{21,42}. However, those studies mention that these infections are exclusively related to sexual relations with male partners, which corroborates studies that showed that WSW undergo fewer gynecological consultations, fewer routine tests for cervical cancer screening and fewer serological tests^{13,43-45}.

Our research data show that health centers should increasingly use mass media and promote a closer contact between formal education equipment and workspaces for the dissemination of clear and specific information about the STI/AIDS aimed at WSW, especially considering the knowledge gaps our study highlights. It also suggests that professionals should be better prepared for health education and multidisciplinary actions aimed at WSW, including better planning of educational actions and an emphasis on the role of nurses, given their specific training in this area⁴⁶⁻⁴⁸.

Our study further suggests investing in health education aimed at WSW, especially in inclusion strategies and discussions on this topic in digital media and as content of formal education sub-

jects and courses on health. Since these sources of information on STI/AIDS are the least often mentioned by this group, it is essential that this topic be included in continuous education of health professionals.

One of the drawbacks of our study is the fact that it was developed at a regional level, preventing us from creating comparison groups between women who have sex exclusively with women and those who have sex with both men and women. This is due to the difficulty of creating a representative sample and to the fact that subjects are mostly white and have a high level of education. However, our research remains relevant insofar as it addresses a population group that is considered difficult to access, the lack of studies on that topic and due to its originality, which results from having used a highly reliable instrument that allows to reduce the knowledge gap in this area and thus subsidize actions aimed at the sexual and reproductive health of this population group.

Conclusion

The WSW investigated in the present study had poor knowledge about STI/AIDS compared to WSM and the fact that they were less educated was independently associated with this outcome. There is an emerging need to put into practice public policies aimed at WSW, as well as a need to invest in health education aimed at this group, especially considering strategies aimed at mass media, formal education, opportunities in health centers. In addition, we suggest that this topic should be discussed to a greater extent in undergraduate courses and continuing education of health professionals to improve the current situation.

Collaborations

ABH Parenti: conception, planning/design, data collection and interpretation, article writing and review, approval of final version, and article formatting. MAO Ignácio: data collection and interpretation, article writing and critical review, approval of final version. TS Buesso: data collection and approval of final version. MAS Almeida: conception, data interpretation, critical article review and approval of the final version of the manuscript. CMGL Parada: data interpretation, critical article review and approval of the final version of the manuscript. MTC Duarte: conception, planning/design, data interpretation, writing of the article and review, approval of the final version of the manuscript.

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