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Colombian adolescents fail in knowledge regarding HIV and other sexually transmitted infections

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KEYWORDS

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Abstract Introduction/objective: Sexually transmitted infections (STIs) -HIV included- are a major problem in Latin America, mainly in Colombia. In 2021, 17647 cases were reported, which compared to the previous year showed an increase of 29.7%. The main aim of this study was to assess the knowledge regarding HIV and other STIs among the adolescent population in Colombia. **Method:** A total of 2012 Colombian adolescents between 12-19 years of age participated in this study. The HIV and Other Sexually Transmitted Infections Knowledge Scale (KSI), a self-report measure, was administered. The results showed moderate to low general knowledge ($M=9.90$, $SD = 4.64$) regarding HIV and other STIs. Adolescents did not know if a tongue-kiss led to an HIV infection (75%), or whether both the vaginal ring and the IUD were effective methods for preventing HIV/AIDS (82%). **Results:** Results showed better scores in knowledge regarding HIV transmission (84%), HIV testing (66%), and condom use to prevent HIV infection (71%). **Conclusions:** Significant differences were observed in HIV/STIs knowledge between both sexes, but the effect magnitudes were small. Thus, these differences were neglected. This study contributes to understanding the state of knowledge and strengthening prevention strategies of professionals linked to the field of quality of life, education, and sexual healthcare in Colombia.

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Adolescentes colombianos fracasan en conocimientos sobre VIH y otras infecciones de transmisión sexual

PALABRAS CLAVE

Conocimientos en HIV/AIDS,
salud en adolescentes,
ITS en Latinoamérica

Resumen Introducción/objetivo: Las infecciones de transmisión sexual (ITS) y el VIH son un gran desafío en América Latina, principalmente en Colombia. Para el 2021 se reportaron 17647 casos, que comparados con el 2019 muestran un incremento del 29.7%. El objetivo principal de este artículo fue evaluar el conocimiento sobre el VIH y otras ITS en la población adolescente de Colombia. **Método:** En este estudio participaron un total de 2012 adolescentes colombianos con edades entre los 12 y los 19 años. Se administró la Escala de Conocimientos sobre el VIH y otras infecciones de transmisión sexual (KSI) y una medida de autoinforme. **Resultados:** Los resultados mostraron un conocimiento general de moderado a bajo ($M = 9.90$, $SD = 4.64$) sobre el VIH y otras ITS.

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Las adolescentes no sabían si un beso con lengua conducía a una infección por el VIH (75%) o si tanto el anillo vaginal como el DIU eran métodos efectivos para prevenir el VIH/SIDA (82%). Los resultados mostraron mejores puntuaciones en conocimientos sobre la transmisión del VIH (84%), pruebas de detección del VIH (66%) y uso de preservativos para prevenir la infección por el VIH (71%). **Conclusiones:** Se observaron diferencias significativas en el conocimiento del VIH/ITS entre ambos sexos, pero los tamaños del efecto fueron pequeños. Por tanto, estas diferencias fueron despreciadas. Este estudio contribuye a comprender el estado del conocimiento y a fortalecer las estrategias de prevención que realizan los profesionales vinculados al campo de la calidad de vida, la educación y la salud sexual en Colombia.

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Despite the progress recorded in combating HIV and sexually transmitted infections (STIs) over the past two decades, these are still a challenge for many Latin American countries. New infection rates increased by 21% from 2010 to 2019 compared to the Caribbean countries, Central Africa, Europe, and North America, where it decreased significantly (UNAIDS, 2020). In addition, lockdowns, economic restrictions and social isolation associated with the COVID-19 pandemic are having a negative effect on vulnerable populations, including people living with HIV in Latin America (UNAIDS, 2022). A major disparity is the application of strategies that strengthen protective sexual behaviours among populations according to a specific risk. In Colombia, between February 2020 and July 2021, 13864 patients with HIV were diagnosed, which means a reduction of 26.48% compared to the previous year. Of the new cases, 63.09% indicated that they belonged to one or more key population groups and the main mechanism of transmission continues to be sexual (91.24%) (Cuenta de alto costo. Fondo Colombiano de Enfermedades de alto costo, 2022).

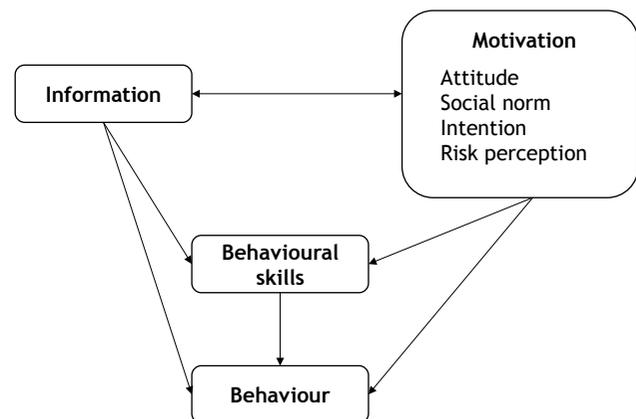
In addition, the World Health Organization (2018) estimated that more than 1 million people worldwide have acquired a STI, and there are estimated to be about 376 million new cases registered in 2016, also more than 500 million people worldwide had the herpes simplex virus, and more than 290 million women had human papillomavirus. In Colombia for the year 2011, the last with available data, 9324 people were treated for syphilis; 2788 for gonorrhoea; 1313 for chlamydia; 1723 for lymphogranuloma venereum (LGV); 1995 for trichomoniasis; 9766 for herpes; 18221 for anogenital warts; 1279 for hepatitis B; and 19478 by papilloma virus. The highest prevalence was in females from 20-29 years of age (Ministerio Nacional de Salud, 2011). Finally, teen pregnancy is another challenge for Latin American countries. According to the (World Health Organization, 2021) in 2020, the global birth rate was 41 per 1000 in women from 15 to 19 years of age; Unfortunately, in Colombia this rate was even higher, 63 per 1000 women.

The highest rates in Colombia for these three major problems suggests that sex education programmes are not effectively applied or have low efficacy (DeMaria et al., 2009; Ivanova et al., 2016; Nelson et al., 2015). Studies with Colombian youth showed higher scores in the CUES (Condom Use Errors/Problems Survey) that indicate higher rates of errors and problems, a strong influence of cultural beliefs such as machismo due to the traditional practices of couple formation and gender roles on the Colombian coast, the effect of a partner's disapproval in condom use, and lesser female

condom use compared to men (Gómez-Lugo et al., 2020; Morales et al., 2018, 2019; Sanchez-Mendoza et al., 2020).

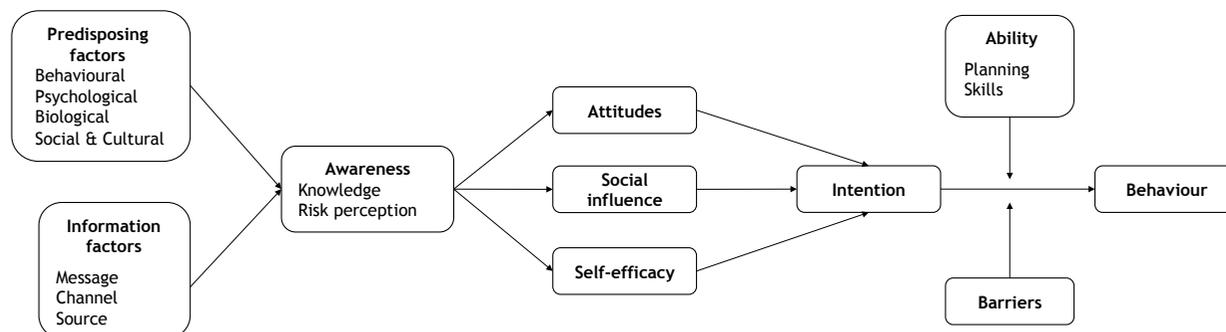
According to the information-motivation-behavioural skills model (IMB) (Fisher et al., 1994) (see Figure 1) and the integrated model for explaining motivational and behavioural change or the I-Change model (ICM) (De Vries et al., 2005) (see Figure 2), self-efficacy, attitudes, and knowledge are the main variables in predicting sexual health promotion among young people and influencing health behaviour and both have been widely used to predict and promote them, coming from personal beliefs to cultural and community practices that impact the overall quality of life (Espada et al., 2014; Jiang et al., 2019; Xu et al., 2017; Yu et al., 2018). HIV/AIDS knowledge and condom self-efficacy form a self-enhancement system over time in which HIV/AIDS knowledge is significantly and causally related to the intention to use condoms through a process mediation of multiple pathways, and self-efficacy and the intention to use condoms during sex forms a positive feedback loop (Chen & Chen, 2022; Negash et al., 2021)

Figure 1. Information-motivation-behavioural skills model (IMB)



Source: Fisher et al. (1994).

However, there is a significant gap in knowledge regarding HIV/STIs among adolescents due to several erroneous beliefs concerning the inability to experience sexual satisfaction when using condoms, a lack of condom self-use efficacy, misconceptions with respect to the pathways of HIV spread and prevention, and certain differences between gender and immigrant status (Butts et al., 2018; Mahat, 2019; Von Rosen et al., 2018).

Figure 2. I-Change model (ICM)

Source: De Vries et al. (2005).

In Colombia studies showed that adolescents had a moderate to low level of knowledge with reference to sexual health, due to reported misconceptions about HIV, no perceived HIV risk, reported low self-efficacy in order to prevent the infection, religious beliefs that influenced the decision-making for HIV prevention, and erroneous beliefs regarding the relationship between alcohol consumption and condom use self-efficacy (Cardona-Duque et al., 2015; Castillo-Ávila et al., 2017; Gómez-Lugo et al., 2020; Morales et al., 2018; Rengifo-Reina et al., 2012; Sanchez-Mendoza et al., 2020).

Previous results have shown the importance of recognizing what adolescents understand regarding HIV and how to prevent its spread (Gómez-Lugo et al., 2022). The present study has aimed to evaluate the knowledge of HIV and other STIs among Colombian adolescents, to contribute to the characterisations of the Colombian and Latino populations, and to contribute to strengthening school-based health prevention programmes.

Methods

Participants

The project was approved by the ethics and scientific committees of the participating universities. Schools were located in middle-low-income neighborhoods. Some of them were public schools, which meant the tuition fee was at a government-subsidised rate. A total of 2012 adolescents participated in this study and completed the sociodemographic and KSI questionnaires. Inclusion criteria were (a) they had their parent/legal tutor sign the informed consent sheet, (b) they had signed an informed assent, (c) they studied in a school that signed a research participation agreement, (d) they were between 12 and 19 years of age, and (e) they were able to read and write in Spanish.

The mean age of the participants was 15.24 years ($SD = 1.33$). A total of 52.1% ($n = 1048$) were females and 47.9% ($n = 960$) were males. No significant differences were observed between sex and age or whether they had a stable romantic partner but differences were observed in sexual orientation ($\chi^2 = 75.92$ [14]; $p < .01$; $\eta = .13$) and educational level ($\chi^2 = 18.85$ (6); $p < .01$; $\eta = .09$). The characteristics of the samples are listed on Table 1.

Instruments

Sociodemographic Variables. An ad hoc questionnaire was created to assess sex, age, nationality, city of residence, educational level, sexual orientation, and whether they had a stable romantic partner. The questionnaire had previously been used in a Colombian context (Morales et al., 2018).

The HIV and Other Sexually Transmitted Infections Knowledge Scale (KSI, Espada et al., 2014). This instrument comprised of 24 items that evaluated aspects related to knowledge of HIV and other STIs. It was developed in Spain and adapted for Colombia. It was answered on a “know” or “do not know” scale. Items are grouped into five subscales: (a) overall HIV knowledge, (b) condom knowledge, (c) HIV transmission knowledge, (d) knowledge about other STIs, and (e) HIV prevention knowledge. Reliability indices in Colombia ranged from .64 to .87. In the current study, Cronbach alphas ranged from .75 to .86.

Procedure

The KSI required an informed consent from the parents and requested an informed assent from the adolescents and was self-administered in classrooms using a printed form. Psychologists and psychology students accompanied the process. The process lasted 25 minutes and was voluntary and anonymous, hence, teachers were not present in the classroom during the evaluation, and parents did not know the answers. The maximum number of students evaluated per group was 35.

Data Analysis

All analyses in this study were performed using the R language and Rstudio (R Core Team, 2022). The use of the packages ggplot2 (Wickham, 2016) and ggstatsplot (Patil, 2021) is highlighted.

Results

The average score was 41.32% ($SD = 22.65$), and in the range from 0 to 24, the observed mean was 9.90 ($SD = 4.64$). This indicated a rather moderate to low average knowledge.

Table 1. Sample characteristics

	Males N %	Females N %	Total N %
<i>Age</i>			
12	11 (1.1)	11 (1.1)	22 (1.1)
13	86 (9.0)	79 (7.5)	165 (8.2)
14	207 (21.6)	209 (19.9)	417 (20.7)
15	258 (26.9)	318 (30.3)	577 (28.7)
16	218 (22.7)	259 (24.7)	477 (23.7)
17	127 (13.2)	138 (13.2)	266 (13.2)
18	44 (4.6)	29 (2.8)	74 (3.7)
19	9 (0.9)	5 (0.5)	14 (0.7)
<i>Middle school level N(%)</i>			
8th grade	150 (15.6)	135 (13.0)	285 (14.2)
9th grade	374 (38.9)	369 (35.5)	743 (37.7)
10th grade	326 (34.0)	349 (33.5)	675 (33.5)
11th grade	110 (11.5)	183 (18.0)	293 (14.6)
<i>Sexual orientation N(%)</i>			
Exclusively heterosexual	827 (92.6)	851 (87.2)	1678 (89.7)
Predominantly heterosexual, only incidentally homosexual	13 (1.4)	45 (4.8)	58 (3.1)
Predominantly heterosexual, but more than incidentally homosexual	6 (0.6)	11 (1.2)	17 (0.9)
Equally heterosexual and homosexual	10 (1.0)	24 (2.5)	34 (1.8)
Predominantly homosexual, but more than incidentally heterosexual	1 (0.2)	4 (0.4)	5 (0.4)
Predominantly homosexual, only incidentally heterosexual	5 (0.5)	1 (0.1)	6 (0.3)
Exclusively homosexual	11 (1.4)	8 (0.8)	19 (1.1)
Asexual	22 (2.3)	30 (3.0)	52 (2.7)
<i>Do you currently have a stable couple (more than six months)</i>			
Yes	283 (30.1)	374 (36.1)	658 (33.1)
No	654 (69.4)	658 (63.7)	1315 (66.4)

Note. N=2012, male=960 and female = 1048.

As shown in Figure 3, the percentage of success and error in the items was variable. In general, adolescents failed many questions on the subscale of other STIs. Some items stood out, such as question 15, in which 75% of adolescents did not know whether a tongue-kiss led to HIV infection, and question 11, in which 82% of adolescents did not know whether the vaginal ring and the Copper T were both effective methods for preventing HIV/AIDS. Additionally, almost half of the adolescents did not know whether contraceptive pills prevented HIV, but they knew that HIV could be transmitted through sexual pathways.

Finally, Figure 4 shows the fields in which sex education should concentrate the most. Questions regarding other STIs or HIV prevention and transmission were the dimensions with the greatest accumulation of error. Some differences were also found by sex (except for the condom dimension), where women showed more knowledge than men. However, the small effect sizes observed did not suggest differentiated interventions.

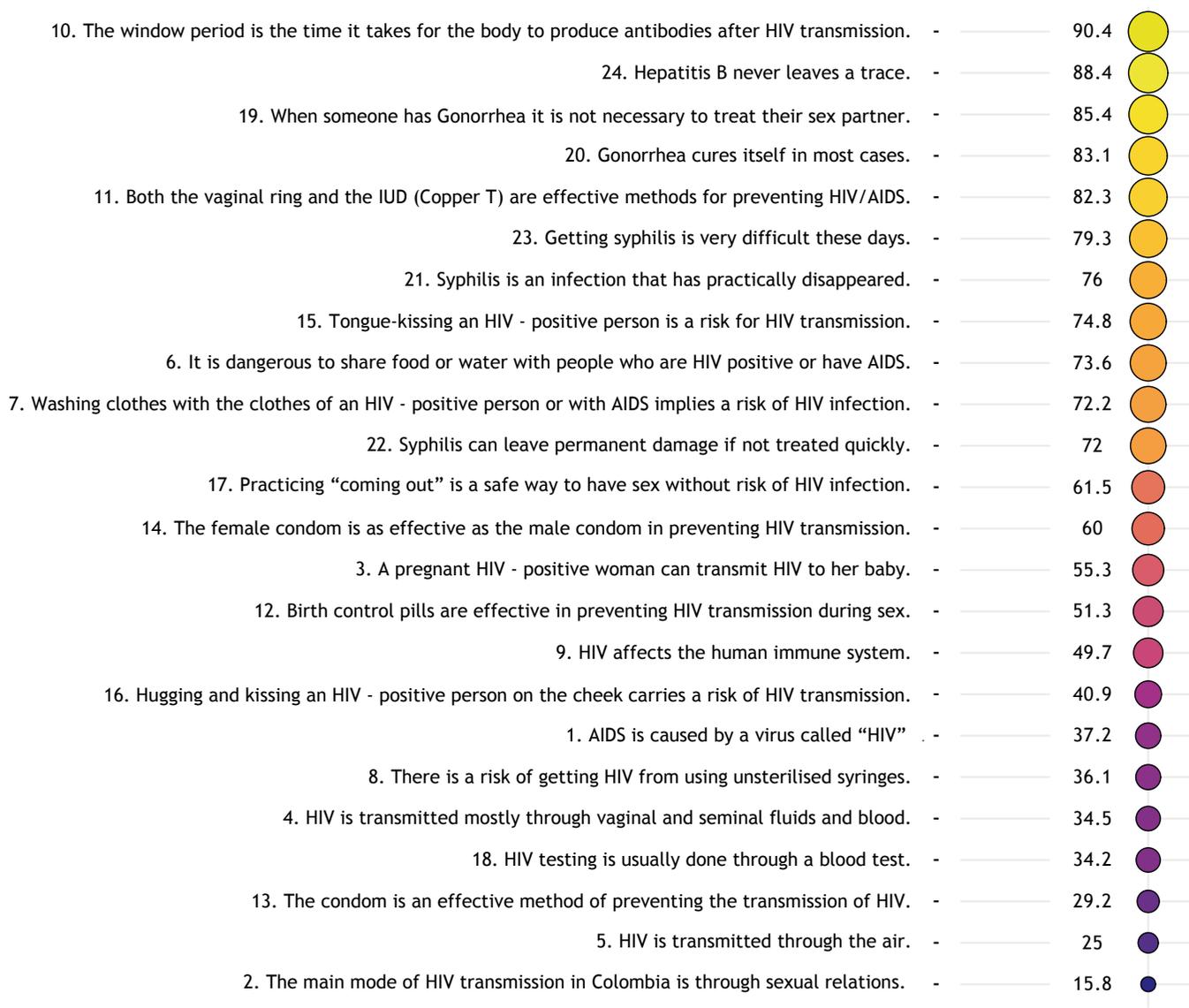
Discussion

The present study shows that Colombian adolescents have moderate to low knowledge of HIV and other STIs. Using the KSI (possible scores ranging from 0 to 24), the group mean level of knowledge regarding HIV and other STIs

in our sample was considered moderate to low, $M = 9.90$ ($SD = 6.64$). This result was consistent with the baseline level of knowledge on HIV and other STIs reported in other studies performed with the participation of a Colombian sample of equivalent sociodemographic characteristics (Abello-Luque et al., 2021; Cardona-Duque et al., 2015; Castillo-Ávila et al., 2017; Morales et al., 2018; -Reina et al., 2012)

However, the level of knowledge with respect to HIV and other STIs of Colombian youth is significantly lower than that reported in studies that used the same instrument (KSI) in adolescents in Spain, due to the application of a prevention programme (COMPAS) that includes a description of how HIV affects the body, a self-talk activity, a guided visual imagery activity, and styles of communication applied to dealing with risky sexual situations (e.g., assertive, passive, and argumentative) aimed at school students (Espada et al., 2017; Espada, Escribano, et al., 2015; Espada, Morales, et al., 2015).

Knowledge regarding HIV and other STI transmissions and prevention in the adolescent population is an important feature of sexual behaviour and health. However, it might not be sufficiently protective in and of itself, because the behavioural component made up of actual skills as well as the perception of self-efficacy is a model component that also determines the adolescent's self-care behaviour (Fisher et al., 1994).

Figure 3. Heat map of the percentage of known/not known items answered

Note. Participants knowledge regarding HIV and other STIs is shown.

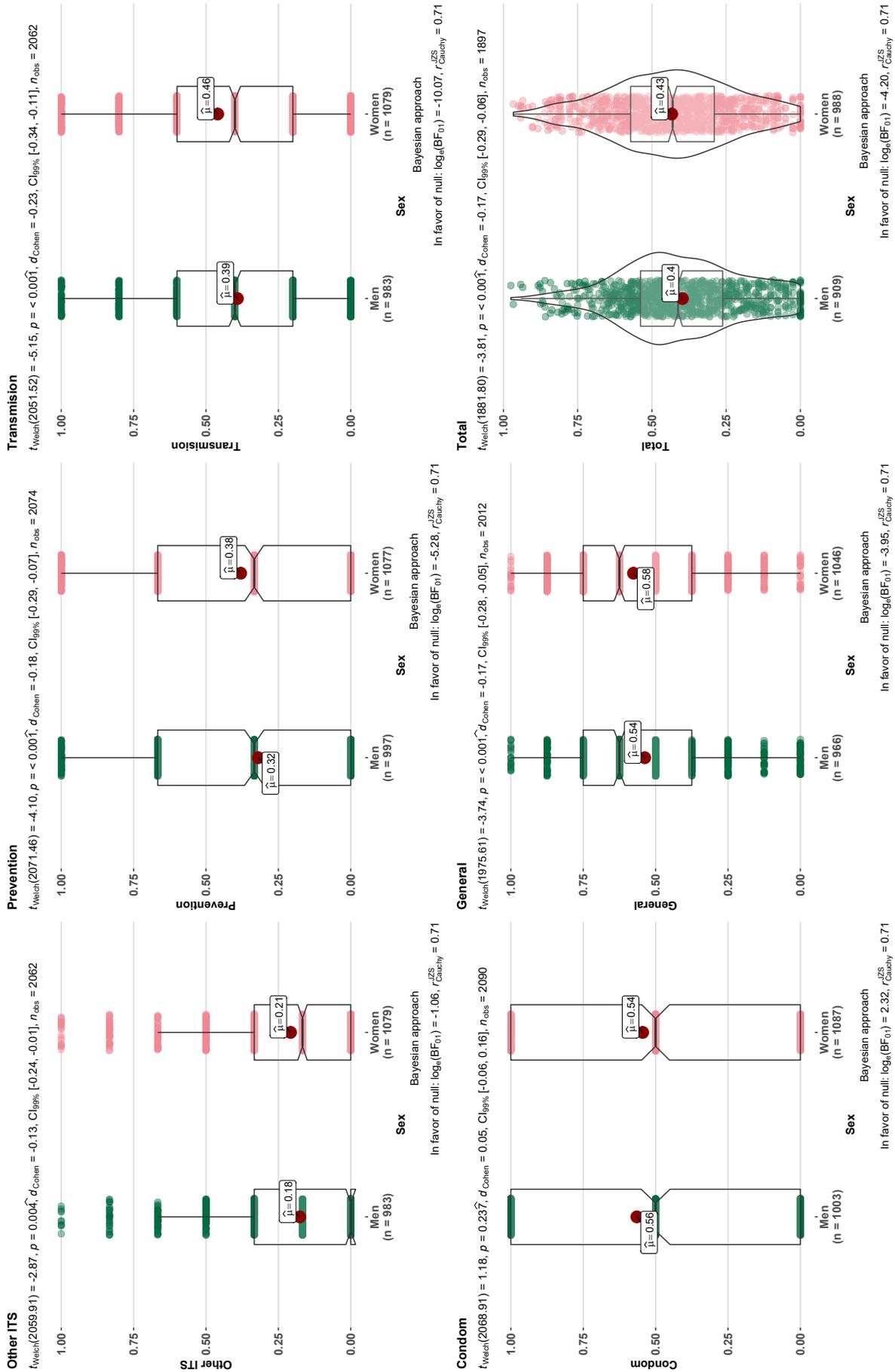
Inadequate knowledge of STI protection practices is a risk factor for lack of condom use in the adolescent population, (Espada, Morales, et al., 2015; Morales et al., 2018) and misconceptions can result in unprotected sex with an infected partner and early sexual intercourse initiation due to an incorrect self-confidence of invulnerability (Lescano et al., 2020; Ma & Malcolm, 2016).

In this study, some differences have been found by gender, being that women had a slightly higher the knowledge than men (except for condom dimensions), possibly due to the active role of parents in the sexual education of daughters and in the educational processes of schools aimed at preventing early pregnancy focusing on female adolescents. However, the small effect sizes do not suggest differentiated interventions. Other studies showed similar results (Cardona-Duque et al., 2015; Castillo-Ávila et al., 2017; Espada, Morales, et al., 2015).

There is evidence that knowledge regarding HIV and other STIs is lower in the new generations of young people than in the previous generations, even though more information is currently available (Espada, Escribano, et al., 2015). These results suggest a scarcity of interventions to promote sexual health and that those that are implemented do not achieve the expected results (DeMaria et al., 2009; Ivanova et al., 2016; Nelson et al., 2015).

New interventions should involve parents and school community members in order to share clear and reliable information with respect to HIV/STIs at both homes and schools and find spaces for safe conversations concerning these topics in places with strong cultural and religious beliefs, without stigmatisation or discrimination against adolescents. Training in condom use also needs to be strengthened, emphasising that this does not promote early sexual intercourse initiation in adolescents.

Figure 4. Box plot representation of sex differences in all dimensions and in total.



Note. Values are represented as follows: μ = mean, t welch correction for homocedasticity was used, CI = Confident Interval, BF = Bayes Factor.

This study has strengths related to data analysis, multicultural population, participants in different stages of adolescent development, and equivalence in the male and female samples, which contribute to the understanding of the state of knowledge of Colombian adolescents in a broad way and strengthens prevention strategies carried out by different professionals linked to the field of quality of life, education, and sexual healthcare.

Limitations

The main limitation of this study is the sampling. Since, it is a non-randomised sampling, conclusions should not be generalised to other populations. Thus, the results should be interpreted with caution. In addition, students who did not attend the lectures, probably those with the most gaps in knowledge regarding this topic, were not evaluated. Finally, we underscore the use of self-report measures, because participants may make the more socially acceptable answer rather than be truthful, and the answers may be related to recent or significant experience and other factors.

Conclusion

Existing literature on the knowledge regarding HIV and other STIs in adolescents showed moderate to high levels in developed countries. In Colombia, the results showed a moderate to low knowledge. Some reasons can be related to the lack of a policy regarding adolescent sexual healthcare and gaps in state policies on sex education in schools. Colombia's great challenge is to coordinate economic and social development and targeting resources, contributing to eradicating inequality in access to health promotion and prevention services.

This study showed the relevance of strengthening school-based programmes in which parents and teachers break gender stereotypes, wrong beliefs, and cultural practices that affect rational decision-making with regard to adolescent sexual behaviour. In addition, there are some differences in knowledge between genders, but we did not find a size effect that indicated the need for differential training. It is imperative to instruct adolescents on the proper use of a condom, the use and effects of birth control pills, and finally, the promotion and prevention services available in the country.

Conflicts of interest

We have no known conflict of interest to disclose.

References

- Abello-Luque, D., Espada, J. ., García-Montaño, E., Gómez-Lugo, M., Morales-Sabuco, A., Pérez-Pedraza, D., & Vallejo-Medina, P. (2021). Colombian Adaptation of the HIV and Other Sexually Transmitted Infections Knowledge Scale (KSI) in an Adolescent Population. *Evaluation & the Health Professions*, *44*(2), 161-167. <https://doi.org/10.1177/0163278720979621>
- Butts, S. A., Kayukwa, A., Langlie, J., Rodriguez, V. J., Alcaide, M. L., Chitalu, N., Weiss, S. M., & Jones, D. L. (2018). HIV knowledge and risk among Zambian adolescent and younger adolescent girls: challenges and solutions. *Sex Education*, *18*(1), 1-13. <https://doi.org/10.1080/14681811.2017.1370368>
- Cardona-Duque, D. V., Ariza-Gerena, A., Gaona-Restrepo, C., & Medina-Pérez, Ó. A. (2015). Conocimientos sobre sexualidad en adolescentes escolares en la ciudad de Armenia, Colombia. In *Revista Archivo Médico de Camagüey* *19*, 568-576.
- Castillo-Ávila, I. Y., Ramírez-Aguilar, J. P., Silva-Yepes, K. P., Caballero-Pacheco, M. A., & Arrieta-Yepes, K. (2017). Conocimientos, actitudes, susceptibilidad y autoeficacia frente a la infección por VIH en adolescentes de Cartagena, Colombia. *Universidad Y Salud*, *19*(1), 26-36. <https://doi.org/10.22267/rus.171901.66>
- Chen, D.-G., & Chen, X. (2022). Full Longitudinal Mediation Modeling Analysis of HIV/AIDS Knowledge, Self-Efficacy, and Condom-Use Intention in Youth. *Journal of the Society for Social Work and Research*, *13*(1), 161-177.
- Cuenta de alto costo. Fondo Colombiano de Enfermedades de alto costo. (2022). *Situación del VIH y Sida en Colombia 2021*. Ministerio de Salud y Protección Social. <https://cuentadealtocosto.org/site/publicaciones/situacion-del-vih-y-sida-en-colombia-2021/>
- De Vries, H., Mesters, I., Van de Steeg, H., & Honing, C. (2005). The general public's information needs and perceptions regarding hereditary cancer: an application of the Integrated Change Model. *Patient Education and Counseling*, *56*(2), 154-165. <https://doi.org/10.1016/j.pec.2004.01.002>
- DeMaría, L. M., Galárraga, O., Campero, L., & Walker, D. M. (2009). Educación sobre sexualidad y prevención del VIH: un diagnóstico para América Latina y el Caribe. *Revista Panamericana de Salud Pública*, *26*, 485-493.
- Espada, Jose P, Escribano, S., Morales, A., & Orgilés, M. (2017). Two-year follow-up of a sexual health promotion program for Spanish adolescents. *Evaluation & the Health Professions*, *40*(4), 483-504.
- Espada, José P, Escribano, S., Orgilés, M., Morales, A., & Guillén-Riquelme, A. (2015). Sexual risk behaviors increasing among adolescents over time: comparison of two cohorts in Spain. *AIDS Care*, *27*(6), 783-788.
- Espada, José P, Morales, A., Orgilés, M., Jemmott III, J. B., & Jemmott, L. S. (2015). Short-term evaluation of a skill-development sexual education program for Spanish adolescents compared with a well-established program. *Journal of Adolescent Health*, *56*(1), 30-37.
- Espada, José Pedro, Guillén-Riquelme, A., Morales, A., Orgilés, M., & Sierra, J. C. (2014). Validación de una escala de conocimiento sobre el VIH y otras infecciones de transmisión sexual en población adolescente. *Atención Primaria*, *46*(10), 558-564.
- Fisher, J. D., Fisher, W. A., Williams, S. S., & Malloy, T. E. (1994). Empirical tests of an information-motivation-behavioral skills model of AIDS-preventive behavior with gay men and heterosexual university students. *Health Psychology*, *13*(3), 238.
- Gómez-Lugo, M., Morales, A., Saavedra-Roa, A., Niebles-Charris, J., Abello-Luque, D., Marchal-Bertrand, L., García-Roncillo, P., García-Montaño, E., Pérez-Pedraza, D., & Espada, J. P. (2022). Effects of a Sexual Risk-Reduction Intervention for Teenagers: A Cluster-Randomized Control Trial. *AIDS and Behavior*, 1-13.
- Gómez-Lugo, M., Morales, A., Saavedra-Roa, A., Niebles-Charris, J., García-Roncillo, P., Marchal-Bertrand, L., Espada, J. P., & Vallejo-Medina, P. (2020). Psychometric properties of the Colombian version of the HIV attitudes scale for adolescents. *International Journal of Environmental Research and Public Health*, *17*(13), 4686.
- Ivanova, O., Cordova-Pozo, K., Segura, Z. E., Vega, B., Chandra-Mouli, V., Hindin, M. J., Temmerman, M., Decat, P., De Meyer, S., & Michielsens, K. (2016). Lessons learnt from the CERCA Project, a multicomponent intervention to promote adolescent sexual and reproductive health in three Latin Ame-

- rica countries: a qualitative post-hoc evaluation. *Evaluation and Program Planning*, 58, 98-105.
- Jiang, H., Chen, X., Li, J., Tan, Z., Cheng, W., & Yang, Y. (2019). Predictors of condom use behavior among men who have sex with men in China using a modified information-motivation-behavioral skills (IMB) model. *BMC Public Health*, 19(1), 261.
- Lescano, C. M., Castillo, H. L., Calcano, E., Mayor, M., Porter, M., Rivera-Torgerson, Y., Dion, C., Marhefka, S. L., Barker, D., Brown, L. K., & Group, T. L. S. R. (2020). Latino STYLE: Preliminary Findings From an HIV Prevention RCT Among Latino Youth. *Journal of Pediatric Psychology*, 45(4), 411-422. <https://doi.org/10.1093/jpepsy/jjaa019>
- Ma, M., & Malcolm, L. R. (2016). Cultural influences on HIV testing among Latino youth. *Culture, Health & Sexuality*, 18(4), 470-480. <https://doi.org/10.1080/13691058.2015.1084650>
- Mahat, G. (n.d.). Relationships Between Adolescents' Knowledge, Attitudes, and Fears Related to HIV/AIDS. *Research and Theory for Nursing Practice*, 33(3), 292-2019. <https://doi.org/10.1891/1541-6577.33.3.292>
- Ministerio Nacional de Salud. (2011). *Situación de las infecciones de transmisión sexual diferentes al VIH. Colombia 2009 - 2011*. <https://bit.ly/3txG6kv>
- Morales, A., García-Montaño, E., Barrios-Ortega, C., Niebles-Charris, J., García-Roncillo, P., Abello-Luque, D., Gomez-Lugo, M., Saavedra, D. A., Vallejo-Medina, P., Espada, J. P., & others. (2019). Adaptation of an effective school-based sexual health promotion program for youth in Colombia. *Social Science & Medicine*, 222, 207-215.
- Morales, A., Vallejo-Medina, P., Abello-Luque, D., Saavedra-Roa, A., García-Roncillo, P., Gomez-Lugo, M., García-Montaño, E., Marchal-Bertrand, L., Niebles-Charris, J., Pérez-Pedraza, D., & Espada, J. P. (2018). Sexual risk among Colombian adolescents: knowledge, attitudes, normative beliefs, perceived control, intention, and sexual behavior. *BMC Public Health*, 18(1), 1377.
- Negash, S., Roberson, P. N. E., Seshadri, G., & Ayres, K. (2021). Relational Factors and Sexual Health for Female College Students in Exclusive Heterosexual Relationships. *Sexuality & Culture*, 25(6), 2111-2128.
- Nelson, A., Cordova, D., Walters, A. S., & Szecsy, E. (2015). Storytelling for Empowerment for Latino Teens: Increasing HIV Prevention Knowledge and Attitudes. *Journal of Adolescent Research*, 31(2), 202-231. <https://doi.org/10.1177/0743558415588350>
- Patil, I. (2021). Visualizations with statistical details: The 'ggstatsplot' approach. *Journal of Open Source Software*, 6(61), 3167.
- R Core Team. (2022). *R: A language and environment for statistical computing*. Computing, R Foundation for Statistical.
- Rengifo-Reina, H. A., Córdoba-Espinal, A., & Serrano-Rodríguez, M. (2012). Conocimientos y prácticas en salud sexual y reproductiva de adolescentes escolares en un municipio colombiano. *Revista de Salud Pública*, 14, 558-569.
- Sánchez-Mendoza, V., Soriano-Ayala, E., & Vallejo-Medina, P. (2020). Psychometric Properties of the Condom Use Self-Efficacy Scale among Young Colombians. *International Journal of Environmental Research and Public Health*, 17(11). <https://doi.org/10.3390/ijerph17113762>
- UNAIDS. (2020). *UNAIDS DATA 2020*. https://www.unaids.org/sites/default/files/media_asset/2020_aids-data-book_en.pdf
- UNAIDS. (2022). *Monitoreo global del SIDA 2022. Indicadores y preguntas para el seguimiento de los progresos de la Declaración Política sobre el VIH y el SIDA de 2021*. https://www.unaids.org/sites/default/files/media_asset/2020_aids-data-book_en.pdf
- Von Rosen, F. T., Von Rosen, A. J., Müller-Riemenschneider, F., Damberg, I., & Tinnemann, P. (2018). STI knowledge in berlin adolescents. *International Journal of Environmental Research and Public Health*, 15(1), 110. <https://doi.org/10.3390/ijerph15010110>
- Wickham, H. (2016). *ggplot2: elegant graphics for data analysis*. springer.
- World Health Organization. (2018). *Report on global sexually transmitted infection surveillance 2018*. <https://apps.who.int/iris/bitstream/handle/10665/277258/9789241565691-eng.pdf?ua=1>
- World Health Organization. (2021). *Sexually transmitted infections (STIs)*. [https://www.who.int/news-room/fact-sheets/detail/sexually-transmitted-infections-\(stis\)](https://www.who.int/news-room/fact-sheets/detail/sexually-transmitted-infections-(stis))
- Xu, Y., Chen, X., Yu, B., Joseph, V., & Stanton, B. (2017). The effects of self-efficacy in bifurcating the relationship of perceived benefit and cost with condom use among adolescents: A cusp catastrophe modeling analysis. *Journal of Adolescence*, 61, 31-39. <https://doi.org/10.1016/j.adolescence.2017.09.004>
- Yu, B., Chen, X., Stanton, B., Chen, D.-G. D., Xu, Y., & Wang, Y. (2018). Quantum changes in self-efficacy and condom-use intention among youth: A chained cusp catastrophe model. *Journal of Adolescence*, 68, 187-197. <https://doi.org/10.1016/j.adolescence.2018.07.020>