Brief Report

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Analysis of the Efficacy of an Affective-Sexual Education Program and Health Perception in 14- to 15-Year-Olds

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Abstract: Objective: The aim of this study is to evaluate the effectiveness of an affective-sexual education programme among 14-15 year-old adolescents and its impact on their perception of their health. **Design:** This is a quantitative, descriptive and prospective quasi-experimental study, employing various cross-sections throughout the school year. It constitutes an educational promotion intervention where a health blog serves as a supplementary component to the "Health and School" programme. This phase is assessed using specific tools designed to evaluate scales. The study aims to assess the programme's effectiveness in the areas of knowledge and attitudes related to sexuality, sexually transmitted diseases, and affectivity. Additionally, it aims to evaluate the intervention's impact on 292 secondary school students, divided into a control group (N=144) and an intervention group (N=148). Both groups belong to the same population and have undergone affective-sexual education interventions focusing on gender and sexual diversity perspectives. The assessment considers perceptions and behaviours related to knowledge about HIV and other STDs/STIs, attitudes towards HIV, health anxiety, and AIDS phobia. Cross-sectional comparisons between the control and intervention groups are conducted at three points during the school year: longitudinal study, baseline, at month 4, and at month 9 post-intervention. **Methods:** Median and interquartile range, Wilcoxon test for numerical variables and Fisher's test for categorical variables were calculated according to intervention group. **Results**: 53% of the students reported a very good perception of health, compared to 45% with a good perception. Boys reported a good perception of health (85%) and had perceptions of their physical appearance and health ($p=0.023$) and ($p<0.001$) in the intervention group. Differences were found between perceptions of physical appearance in the control group, which was close to normal ($p=0.429$). In terms of level of knowledge about HIV and other STDs/STIs, the most significant difference was found in knowledge about HIV transmission, which varied between groups. **Conclusions:** Early affective-sex education sessions have an impact on health perception and behaviours related to knowledge about HIV and other STDs/STIs, leading to reduced anxiety in adolescents. School nurses should focus on health promotion, prevention of sex-related diseases, healthy attitudes from a gender perspective and integrated affective relationships in all their dimensions.

Keywords: adolescents; affectivity-sexuality; gender; promotion; Schools; STD/STI

Background

Adolescence is universally recognised as a phase of transformation, marked by significant physical, psychological, social, and emotional changes, a crucial bridge between childhood and adulthood. This period involves a search for identity, encompassing facets such as self-acceptance, objective knowledge, personality, sexual identity, vocation and personal ideology with associated

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values. The fluidity of self-esteem and self-concept during adolescence is intricately influenced by factors such as upbringing, environment, context and individual capacities[1].

Sexuality, an inherent aspect that is experienced throughout life, unfolds differently at each stage, extending beyond anatomy to encompass affective dimensions such as emotions, experiences and cultural influences. Inadequate knowledge in this area leads to risky behaviours that affect health, with consequences such as unwanted pregnancies, sexually transmitted infections (STIs) or sexual abuse[2].

STIs are a significant global health problem. According to the World Health Organisation (WHO) and other health organisations, it is estimated that more than 1 million people worldwide acquire an STI every day. Some of the most common STIs include HIV, syphilis, gonorrhoea, chlamydia and human papillomavirus (HPV).

Young people are more susceptible to STIs due to risky behaviours, lack of comprehensive sexuality education and, in some cases, limited access to sexual health services. STIs can have serious long-term consequences, such as infertility, complications during pregnancy, and increased risk of HIV transmission.

The presence of an STI can have a significant psychological and social impact on young people, including stigmatisation, discrimination and difficulties in interpersonal relationships. STIs often disproportionately affect young women, highlighting gender inequalities in access to sexual health information and services.

Young people sometimes face barriers to accessing sexual health services, such as lack of confidentiality, shame, and lack of resources.

Current gender stereotypes and roles continue to influence the way adolescents experience and express their sexuality[3]. Gender, identified as a risk factor for STI acquisition, needs to be integrated into educational processes to address existing inequalities. Recognising gender-specific needs is crucial but is often overlooked in interventions with adolescents[4].

Although HIV and STI prevalence in Catalonia and Europe shows a downward trend, the possible impacts of the Sars-Cov-2 pandemic on these outcomes deserve consideration. In 2020, the estimated HIV rate was 4.2/100,000 inhabitants, and STI rates decreased by 31.1% compared to the previous year[5].

There are several resources available for Catalan adolescents, such as Tarda Jove, Centre Jove d'Anticoncepció i Sexualitat (CJAS), Sexe Jove (website), Canal Salut (website) and Fórmula Joven. However, school education focuses mainly on the prevention of STIs and contraceptive methods, lacking a unified approach at national level and neglecting affective aspects that are essential for comprehensive development and the adoption of healthy behaviours in relation to affective-sexual health[6].

The proliferation of information and communication technologies (ICTs) offers ample opportunities for community interaction. Barriers to ICT use include access, knowledge, attitudes towards computers and mobile phones, and the volume and quality of information[7]. Young people and teenagers appear to be the most enthusiastic users of ICTs and the Internet[8].

Projects such as the "Sexo Joven" website in Catalonia and initiatives in Argentina and Peru take advantage of new technologies for socialisation, encouraging young people to become familiar with the language and formats of these media[9].

The advantages of using information technologies, such as blogs in education, for health promotion are diverse, including simplicity, convenience, and ease of use. These technologies contribute to the development of digital competence, teaching students to use the web as a primary source of information and improving their ability to search, obtain, process, and communicate information to transform it into knowledge[10,11].

In the last decade, nursing professionals have increasingly employed the Health Promotion Model in community and educational settings, addressing a variety of situations ranging from promoting condom use to understanding patients' perceptions of health[12]. The model aims to promote healthy behaviours and aligns with nursing care goals focused on healing, health improvement and disease prevention.

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Sex education, when delivered, can inadvertently perpetuate stereotypes about sexuality and love, potentially reinforcing socially accepted but misguided ideas.

By employing the Health Promotion Model and considering behavioural determinants, this study aims to contextualise young people's prior experiences related to sexuality and affectivity, beliefs, and attitudes. The identification of behaviours susceptible to intervention allows the application of health promotion and prevention methodologies adapted to their profiles. The aim is to reshape attitudes through knowledge, breaking down barriers so that adolescents can enjoy healthy sexuality and sex.

The study aims to assess the effectiveness of an affective-sexual education program in adolescents aged 14 to 15, encompassing their perception of health from a gender perspective.

Methods

Design: A quantitative, descriptive, and prospective quasi-experimental study was carried out, with an intervention group and a control group with three longitudinal follow-up measures during the school year (baseline control, fourth month of intervention and nine-month follow-up (post-intervention).

Participants: The sample comprised a total of 292 students aged 14-15 years in the 3rd year of Compulsory Secondary Education (IES), equivalent to the 11th grade in the United States. The participants were drawn from the only two public Secondary Schools in the Baix Llobregat metropolitan area of Barcelona (Spain). The gender distribution included 124 females and 168 males. The control group consisted of n=144, and the intervention group comprised n=148.

The selected schools, both situated in the same municipality, had incorporated a school health reference nurse and implemented the "Salut i escola 2.0" program within their virtual classroom platform.

Intervention Group: This group consisted of students from one of the IES, with a sample of adolescents (n=148) in the third year of ESO, including 70 boys and 78 girls. This group underwent the entire intervention outlined in a subsequent section.

Control Group: The control group comprised students from the other secondary school (N=144), with 54 boys and 90 girls. No specific intervention was conducted in this group; however, the blog was presented to familiarize them with the resources, and questionnaires were distributed. The blog was integrated into the secondary school website.

The hypothesis posited was that the implementation of interventions for promoting and preventing risk behaviors in the classroom, coupled with access to the "Health and School" 2.0 blog as an easily accessible technological tool disseminated through networks, would enhance knowledge levels about sexuality and contraceptive methods. Furthermore, it was anticipated to improve the perception of the risk of sexually transmitted diseases, health anxiety, and unwanted pregnancies, ultimately fostering optimal sexual health conditions for adolescents.

Intervention: One of the topics addressed by the "Salut i Escola 2.0" programme is affectivity and sexuality, due to the high number of STIs, unprotected sex and unwanted pregnancies.

Focused on this topic, several interventions were developed in 6 sessions between 1h and 1.30h, to talk about the four important topics of the programme on affectivity and sexuality, these sessions are during the first and second school term, with the help of the digital support blog "Salut i escola 2. 0" which you could access by using your own phone, tablet or computer, to learn more about the topic being explained and the contents that continued to appear with the topic dealt with in the interventions directly at the IES, as well as sharing knowledge about related tools within the blog with your classmates. With the aim of reducing the incidence of STIs, students received promotion and prevention activities on cognitive factors such as myths, beliefs, attitudes or psychological factors related to sexuality, sexuality and sexual practices, STIs and specifically HIV/AIDS.

The sessions were held every two weeks during school hours and in small groups of 20 students within the optional subjects used to conduct workshops of this nature. In the control group, the intervention on affectivity and sexuality was carried out by a psychologist using the traditional

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method of teaching-learning from a more conceptual model of oral presentation in the classroom, on STIs, condom use.

The intervention group was carried out by a school nurse trained in pedagogy and sexuality, who by means of classroom teaching sessions and supported by the use of the Blog, sharing information and carrying out interventions that could be consulted as learning material, was carried out in the classroom as a teaching-learning method and later complemented and uploaded more information to the Salut i Escola 2.0 blog.

Measures

HIV/Aids knowledge scale for adolescents. It consists of 10 items with two response options (true or false). The total score ranges from 0 to 10. The scale has a three-factor structure: Risk behaviors, with an internal consistency of 0.78. Effects of HIV, with an internal consistency of 0.57. Transmission, with an internal consistency of 0.61. The reliability coefficient for the total scale will be 0.70 [13].

Attitudes towards HIV/AIDS scale for adolescents[14]. It consists of 12 items with four response alternatives (from 1 = strongly disagree to 4 = strongly agree). The questionnaire has an internal consistency of 0.77, and the items are grouped into four subscales: barriers (three items), screening tests (two items), condom use (four items) and affected persons (three items). The test-retest reliability for the total scale was 0.60 [15]. It includes 4 factors and total score (sum of all items). Attitude towards condom use when there are obstacles to its use: items 1, 2, 3. Attitude towards HIV testing: 4, 5. Attitude towards condoms: 6, 7, 8, attitude towards people living with HIV/AIDS: 10 (reversed), 11, 12 (reversed).

Health anxiety. This is a self-report that assesses concern about health, concern about bodily sensations and fear of the negative consequences of suffering from an illness. It consists of 18 items with four response options that score 0 (no symptoms), 1 (mild symptoms), 2 (severe symptoms) or 3 (very severe symptoms). The internal consistency is 0.95 and the test-retest correlation ranges between 0.83 and 0.87. Shai has demonstrated good psychometric properties with both clinical and non-clinical populations. 2 factors and total score (sum of all items): fear of becoming ill from item 1 to 14, negative consequences of having an illness from item 15 to 18[16].

Phobia on the AIDS Phobia Scale. The test assesses AIDS phobia, looking at the main dimensions of the disorder. It consists of 20 items with a 6-point Likert-type response scale (from 0 = strongly disagree to 5 = strongly agree). The scale has a bifactor structure: fear of infection (Cronbach's alpha = 0.73) and fear of others/avoidance (Cronbach's alpha = 0.70). Temporal stability after one week was 0.64. The higher the score, the higher the AIDS phobia. 2 factors and total score (sum of all items): Fear of infection and Fear of others/avoidance [17].

Sampling and Statistical Analysis

Data Collection

All students from both high schools (292 students aged 14-15 years) were invited to participate. The questionnaires were administered by the principal investigator of the study with the assistance of the teaching staff. This process took place two days after the sessions and subsequently at 4 and 9 months after the intervention once the following academic year had commenced.

Data Analysis

Variables were described for both the overall sample and subgroups based on the condition (intervention vs. control group). Median and interquartile interval (first and third quartile) were used for quantitative variables, while absolute and relative frequencies were employed for categorical variables. Bivariate analysis utilized the Wilcoxon test, assuming a significance level of p=0.05.

Comparisons between the control and intervention groups were conducted longitudinally at three time points: baseline, month 4, and month 9. Effect size scores were calculated at month 4 and month 9, relative to the baseline score, with an effect size of 0.2 considered small, 0.5 moderate, and

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0.8 large (Cohen, Cohen, West, & Aiken, 1988; Kazis, Anderson, & Meenan, 1989). Statistical processing of the data was carried out using the Project R for Statistical Informatics software.

Ethical Statement

The study adhered to the core principles of the Declaration of Helsinki and its subsequent revisions, as well as the standards of Good Clinical Practice. The study protocol received approval from the Ethics Committee of IDIAP Jordi Gol of Barcelona under the number P17/119. The protocol ensures the confidentiality of subjects' data in compliance with the provisions of the Organic Law on the Protection of Personal Data (15/1999 of December 13, LOPD).

3. Results

Of the 292 participants, 75% were 14 years old at the time of the pre-intervention questionnaire at baseline. Of the 292 participants, 75% were 14 years old at the time of the pre-intervention baseline questionnaire. 94.83% of the students were born in the province of Barcelona.

Regarding the adolescents' perception of health, 53% of the girls have a very good perception of health and 45% have a good perception of health. Eighty-two percent of boys have a good overall perception of health and only 11% perceive it as very good.

In Table1, significant gender-based differences were observed, with women exhibiting higher knowledge about other STIs, more positive attitudes toward condom use, HIV testing, and condoms, while no significant differences were found in general HIV knowledge, condom knowledge, HIV prevention knowledge, health anxiety, or AIDS-related fear between men and women.

Table 2 presents scores across various scales related to HIV and STIs, categorized based on whether participants sought information about sexuality on the internet. The findings indicate that individuals who consulted information online demonstrated significantly higher knowledge regarding HIV transmission compared to those who did not (p-value = 0.037). However, no significant differences were observed in knowledge about other STIs (p-value = 0.635), general HIV knowledge (p-value = 0.355), condom knowledge (p-value = 0.782), and HIV prevention knowledge (p-value = 0.176) between the two groups. Regarding attitudes towards HIV, no significant differences were found in attitudes towards condoms in challenging situations (p-value = 0.382), HIV testing (p-value = 0.609), condoms in general (p-value = 0.349), and towards people living with HIV/AIDS (p-value = 0.460). Similarly, there were no significant differences in health anxiety, including the fear of getting sick (p-value = 0.164) and the negative consequences of having a disease (p-value = 0.269). The analysis also revealed no significant disparities in AIDS-related fears, encompassing fear of infection (p-value = 0.107) and fear of others/avoidance (p-value = 0.190). These results suggest that seeking information on sexuality online may contribute to enhanced knowledge about HIV transmission, while other aspects of knowledge, attitudes, and anxieties show comparable patterns irrespective of online information seeking behavior.

The baseline scores (Table 3) for the intervention group reveal statistically significant differences in terms of knowledge. The table presents the median and interquartile range (1st and 3rd quartile) for each scale within the overall sample and across subgroups based on the intervention group. Additionally, the p-value from the Wilcoxon test is provided, with a significance level of $p<0.05$ indicating statistically significant differences between the groups, as determined by the test. Differences in knowledge of HIV transmission and other STIs, as well as attitudes and associated fears, suggest the positive influence of the intervention on these aspects.

This table presents the effect size at Month 4 and Month 9 for each scale in the control and intervention groups. Positive values indicate an increase, while negative values indicate a decrease.

Table 4 and Figure 1, presents the effect size at Month 4 and Month 9 for each scale in the control and intervention groups. Positive values indicate an increase, while negative values indicate a decrease.

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Table 1. Scores on different scales related to HIV and STIs, by gender.

	Men (n=124)	Women (n=168)	p-valor
Scale of Knowledge about HIV and other STIs			
HIV Transmission Knowledge	3.87 [2.54, 5.45]	3.87 [2.82, 5.44]	0.671
Other STIs Knowledge	0.00 [0.00, 1.75]	0.00 [0.00, 0.00]	0.016
General HIV Knowledge	4.39 [3.71, 5.53]	4.18 [3.34, 5.52]	0.202
Condom Knowledge	4.88 [3.76, 5.81]	5.12 [3.87, 5.89]	0.357
HIV Prevention Knowledge	4.14 [3.13, 5.60]	4.45 [3.21, 5.62]	0.258
Attitudes towards HIV			
Attitude towards condom use when facing obstacles	54.82 [41.79, 66.67]	66.67 [51.82, 80.41]	<0.001
Attitude towards HIV testing	66.67 [66.67, 85.26]	68.59 [66.67, 85.26]	0.047
Attitude towards condoms	66.67 [51.83, 73.99]	67.96 [58.98, 82.04]	0.004
Attitude towards people living with HIV/AIDS	44.97 [33.33, 54.12]	43.75 [33.33, 55.43]	0.209
Health Anxiety			
Fear of getting sick	27.72 [21.41, 35.08]	29.45 [21.44, 39.48]	0.373
Negative consequences of having a disease	20.01 [6.99, 31.30]	20.96 [9.46, 36.54]	0.339
AIDS-related Fear			
Fear of infection	17.59 [10.33, 24.65]	18.36 [10.75, 25.87]	0.631
Fear of others/avoidance	72.65 [64.96, 78.17]	71.90 [63.40, 79.39]	0.665

No significant differences were found in the scores on various scales according to the participants' age. These observations provide insights into the homogeneity in knowledge, attitudes, and anxieties related to HIV and STIs across different age groups.

Table 2. Scores on Various Scales Regarding HIV and STIs, According to Seeking Information on Sexuality on the Internet.

	No (n=104)	Yes (n=188)	p-valor
Knowledge about HIV and other ITS			
HIV Transmission Knowledge	3.89 [2.87, 6.46]	3.84 [2.56, 4.81]	0.037
Knowledge of Other STIs	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.635
General HIV Knowledge	4.27 [3.34, 5.94]	4.25 [3.48, 5.27]	0.355
Condom Knowledge	5.12 [3.76, 5.96]	5.07 [3.86, 5.83]	0.782
HIV Prevention Knowledge	4.43 [3.19, 5.96]	4.19 [3.16, 5.43]	0.176
Attitudes towards HIV			
Attitude towards Condoms in Challenging Situations	66.67 [44.08, 77.69]	56.87 [44.08, 74.41]	0.382
Attitude towards HIV Testing	66.67 [66.67, 85.26]	66.67 [66.67, 85.26]	0.609
Attitude towards Condoms	66.67 [59.16, 76.04]	66.67 [54.60, 80.60]	0.349
Attitude towards People Living with HIV/AIDS	44.97 [33.33, 55.03]	42.19 [33.33, 55.03]	0.460
Health Anxiety			
Fear of Getting Sick	27.67 [20.20, 34.98]	28.90 [21.89, 38.70]	0.164
Negative Consequences of Having a Disease	19.29 [8.84, 32.79]	23.14 [9.46, 35.99]	0.269
AIDS-related Fear			
Fear of Infection	16.11 [9.27, 22.79]	18.50 [11.16, 26.08]	0.107
Fear of Others/Avoidance	72.83 [66.95, 79.59]	71.66 [62.74, 78.84]	0.190

Table 3. Basal scores on the different scales on HIV and STDs, in the overall sample and according to intervention group.

	Global Median [1stQ, 3rd Q]	Control Group (n=144)	Intervention group (n=148)	p-value
Knowledge scale on HIV and other STD/STI				
Knowledge HIV transmission	3.87 [2.64, 5.44]	3.80 [2.54, 4.29]	4.16 [2.97, 6.44]	<0.001
Knowledge of other STIs	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00 [0.00, 1.75]	0.069
General HIV knowledge	4.26 [3.38, 5.52]	4.46 [3.85, 5.43]	4.19 [3.27, 5.69]	0.144
Condom knowledge	5.08 [3.84, 5.84]	5.14 [4.41, 5.84]	4.88 [3.36, 5.89]	0.031

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HIV prevention knowledge	4.19 [3.16, 5.62]	4.14 [3.19, 5.31]	4.70 [2.96, 5.98]	0.024
Attitudes towards HIV				
Attitude towards condom use when barriers exist	59.87 [44.08, 77.41]	56.87 [44.08, 74.41]	64.61 [42.02, 78.75]	0.503
Attitude towards HIV testing	66.67 [66.67, 85.26]	66.67 [66.67, 81.41]	70.52 [66.67, 85.26]	0.196
Attitude towards condoms	66.67 [56.03, 77.48]	73.28 [59.34, 82.76]	64.51 [52.37, 73.99]	<0.001
Attitude towards people living with HIV/AIDS	43.75 [33.33, 55.03]	44.97 [33.33, 57.81]	42.97 [33.33, 55.03]	0.425
Health anxiety				
Fear of getting sick	28.57 [21.42, 37.69]	28.90 [20.17, 38.48]	28.07 [21.67, 36.99]	0.819
Negative consequences of having a disease	20.67 [9.46, 34.39]	17.18 [6.70, 32.79]	23.29 [13.68, 35.99]	0.030
AIDS Phobia				
Fear of infection	18.07 [10.64, 25.43]	19.86 [12.18, 29.27]	15.39 [9.05, 21.32]	<0.001
Fear of others/avoidance	72.17 [63.75, 79.00]	71.35 [60.23, 78.11]	72.88 [66.95, 79.70]	0.047

Table 4. Effect Size at Month 4 and Month 9 by Intervention Group on Various Scales Related to HIV and STDs.

	A Month 4		A Month 9	
	Control	**Intervention**	**Control**	**Intervention**
Knowledge Scale on HIV and Other STDs				
Knowledge of HIV Transmission	0.551	1.348	0.551	1.482
Knowledge of Other STDs	0.141	7.356	0.141	8.315
General HIV Knowledge	0.546	3.01	0.546	3.211
Condom Knowledge	0.617	2.538	0.617	2.843
HIV Prevention Knowledge	0.402	2.211	0.402	2.414
Attitudes Toward HIV				
Attitude Toward Condom Use When Barriers Exist	-0.024	0.661	-0.06	0.961
Attitude Toward HIV Testing	-0.012	0.587	-0.117	0.653
Attitude Toward Condoms	-0.097	0.605	-0.235	1.077
Attitude Toward People Living with HIV/AIDS	0.123	0.754	0.12	1.283
Health Anxiety				
Fear of Getting Sick	-0.282	0.178	-0.282	0.062
Negative Consequences of Having a Disease	-0.081	0.035	-0.081	-0.463
AIDS Phobia				
Fear of Infection	0.025	-0.434	0.067	-0.149
Fear of Others/Avoidance	0.189	-2.149	0.492	-3.077

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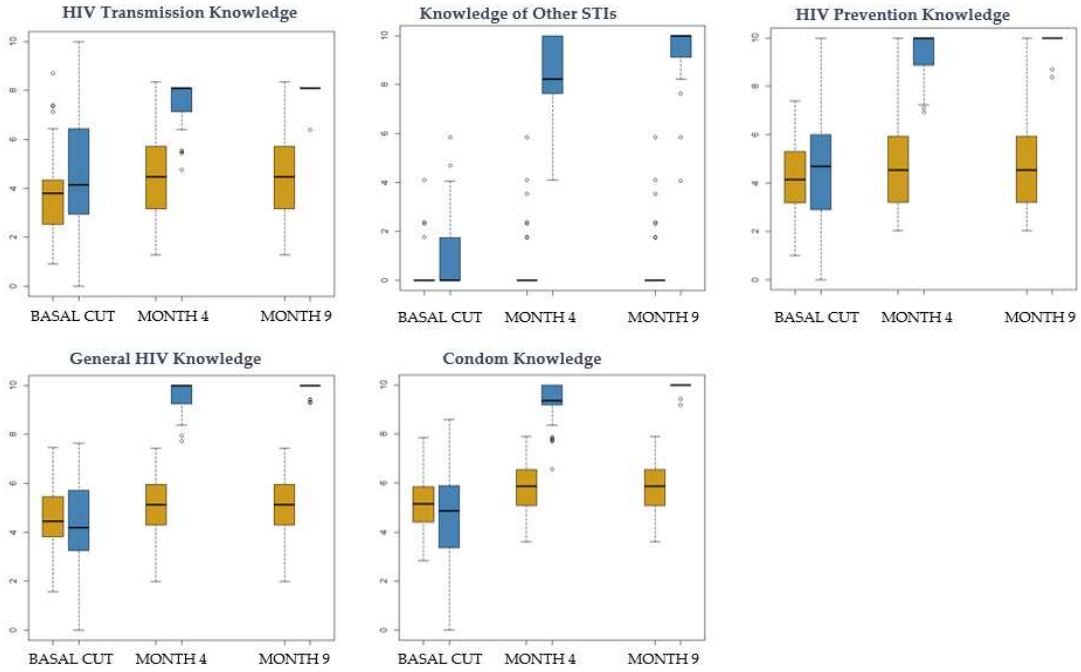

Figure 1. Evolution of scores in the subscales of the HIV and other STIs Knowledge Scale, according to the intervention group.

In terms of knowledge, a statistically significant increase is observed in HIV transmission in the intervention group at both time points, with effect sizes of 1.348 and 1.482, respectively, compared to the control group. The knowledge scale of other STIs shows a particularly notable impact in the intervention group at both periods, with effect sizes of 7.356 and 8.315 at Months 4 and 9, respectively. However, no statistically significant differences are observed in general HIV knowledge between the two groups. Regarding attitudes towards HIV, the intervention group experiences a statistically significant improvement in the attitude towards condom use in challenging situations, with effect sizes of 0.661 at Month 4 and 0.961 at Month 9. Additionally, a statistically significant decrease is observed in fear of others or avoidance in the intervention group, with effect sizes of -2.149 and -3.077 at Months 4 and 9, respectively. These findings suggest statistically significant and sustained impacts of the intervention on knowledge and attitudes related to HIV and STIs over time.

Discussion

Our research aligns with previous studies by demonstrating a positive impact on the affective-sexual health of adolescents in the intervention group. The incorporation of Information and Communication Technologies (ICTs), particularly through the use of a blog, emerges as a valuable tool for knowledge construction. Our findings support the notion that the blog serves as a dynamic platform to address current issues in affectivity and sexuality, providing a continuous and updated source of information accessible to adolescents.

The integration of ICTs within the educational environment, exemplified by the COMPAS Program, highlights the potential of these technologies to create repositories of health promotion materials. This not only enhances accessibility but also provides a cost-effective means of disseminating information. The use of technology, such as blogs, facilitates the process of autonomous learning, allowing adolescents to explore topics relevant to their daily lives, thus contributing to knowledge construction in an engaging manner.

Additionally, the study recognizes the importance of Internet use by adolescents and its implications for intervention planning at both the school and family levels. The potential risks

associated with excessive use of social networks and the Internet underscore the importance of informed and targeted interventions.

The effectiveness of our study, evidenced by the COMPAS Program, is noteworthy, especially in short-term results related to increased knowledge about HIV, improved attitudes toward HIV, condom use, HIV testing, and enhanced intention to use condoms. These results reflect the general consensus that implementing interventions is more beneficial than not doing so, emphasizing the positive impact on HIV prevention among young people.

Furthermore, our study acknowledges the moderating role of gender and sexual status in the intervention's effectiveness. Non-sexually active adolescents and women showed more favorable results, underscoring the importance of early interventions to reduce sexual risk. Gender differences observed, with women exhibiting a more positive attitude toward condom use, highlight the need for gender-specific approaches in sexual health promotion.

In post-intervention consultations, women demonstrated greater knowledge about HIV and exhibited more positive attitudes toward condom use and people living with HIV. These findings align with the Theory of Planned Action, emphasizing the importance of forming positive attitudes to influence behavior. The results support the active role of public health nurses and school nurses in detecting risk behaviors and implementing integrative preventive strategies to enhance health perception within a salutogenic model.

Despite limitations, such as potential biases in self-reported data, our findings underscore the positive impact of the intervention and the potential of ICTs in promoting affective-sexual health among adolescents. Future studies could consider expanding the sample and incorporating qualitative interventions that account for gender differences in risk and protective factors related to sexual behavior.

Conclusions

This research achieves its objectives, confirming the proposed hypothesis: the implementation of prevention and promotion interventions in classrooms, coupled with access to the "Health and School 2.0" blog as a supporting tool, enhances knowledge about sexuality and contraceptive methods. Additionally, it improves the perception of the risk of sexually transmitted diseases, health anxiety, and unplanned pregnancies, thereby optimizing the sexual health conditions of adolescents.

The "Health and School" blog emerges as an effective supporting tool for the promotion and prevention of risk behaviors related to sexuality in the school environment. It facilitates the transmission of information, skill development, and health education.

In a context where adolescents report earlier initiation of sexual activity and an increase in the number of sexual partners, the intervention proves to be crucial. The growing trend of the risk of contracting sexually transmitted infections reflects a lack of information and an unfavorable attitude toward the use of protective methods.

In conclusion, this research highlights the effectiveness of a health education intervention, implemented by nursing professionals and integrated into high schools with the support of the blog. Accessibility, information endorsed by healthcare professionals, and contrasting information prove to be key elements in preventing risky sexual behaviors, sexually transmitted diseases, and promoting self-esteem among adolescents.

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Data Availability Statement: The authors would be pleased to share a clean copy of the database; please contact the corresponding author for further details.

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References

1. Sanz-Martos, S.; López-Medina, I. M.; Álvarez-García, C.; Álvarez-Nieto, C. Efectividad de Las Intervenciones Educativas Para La Prevención Del Embarazo En La Adolescencia. *Atención Primaria* **2019**, *51* (7), 424–434. https://doi.org/10.1016/j.aprim.2018.04.003.
2. Goldfarb, E. S.; Lieberman, L. D. Three Decades of Research: The Case for Comprehensive Sex Education. *J. Adolesc. Heal.* **2021**, *68* (1), 13–27. https://doi.org/10.1016/j.jadohealth.2020.07.036.
3. Meherali, S.; Rahim, K. A.; Campbell, S.; Lassi, Z. S. Does Digital Literacy Empower Adolescent Girls in Low- and Middle-Income Countries: A Systematic Review. *Frontiers in Public Health*. Frontiers Media S.A. December 16, 2021. https://doi.org/10.3389/fpubh.2021.761394.
4. Saura, S.; Jorquera, V.; Rodríguez, D.; Mascort, C.; Castellà, I.; García, J. Percepción Del Riesgo de Infecciones de Transmisión Sexual/VIH En Jóvenes Desde Una Perspectiva de Género. *Atención Primaria* **2019**, *51* (2), 61–70. https://doi.org/10.1016/j.aprim.2017.08.005.
5. CEEISCAT. *Centre d'Estudis Epidemiològics Sobre Les Infeccions de Transmissió Sexual i Sida de Catalunya (CEEISCAT). Vigilància Epidemiològica de Les Infeccions de Transmissió Sexual (ITS) a Catalunya Informe Anual 2021*; 2022. www.ceeiscat.cat.
6. Guerrero Ramírez, C. I.; Espadafor López, B.; Arias-Santiago, S.; Buendía-Eisman, A. Programa de Intervención Escolar Para La Prevención de Las Infecciones de Transmisión Sexual. *Actas Dermosifiliogr.* **2021**. https://doi.org/10.1016/j.ad.2021.06.012.
7. Bozzola, E.; Spina, G.; Agostiniani, R.; Barni, S.; Russo, R.; Scarpato, E.; Di Mauro, A.; Di Stefano, A. V.; Caruso, C.; Corsello, G.; Staiano, A. The Use of Social Media in Children and Adolescents: Scoping Review on the Potential Risks. *Int. J. Environ. Res. Public Health* **2022**, *19* (16), 9960. https://doi.org/10.3390/ijerph19169960.
8. Kokka, I.; Mourikis, I.; Nicolaides, N. C.; Darviri, C.; Chrousos, G. P.; Kanaka-Gantenbein, C.; Bacopoulou, F. Exploring the Effects of Problematic Internet Use on Adolescent Sleep: A Systematic Review. *International Journal of Environmental Research and Public Health*. MDPI AG January 2, 2021, pp 1–14. https://doi.org/10.3390/ijerph18020760.
9. Lameiras-Fernández, M.; Martínez-Román, R.; Carrera-Fernández, M. V.; Rodríguez-Castro, Y. Sex Education in the Spotlight: What Is Working? Systematic Review. *Int. J. Environ. Res. Public Health* **2021**, *18* (5), 2555. https://doi.org/10.3390/ijerph18052555.
10. Eppes, E. V; Augustyn, M.; Gross, S. M.; Vernon, P.; Caulfield, L. E.; Paige, D. M. Engagement With and Acceptability of Digital Media Platforms for Use in Improving Health Behaviors Among Vulnerable Families: Systematic Review. *J. Med. Internet Res.* **2023**, *25*, e40934. https://doi.org/10.2196/40934.
11. Lau, P. W.; Lau, E. Y.; Wong, D. P.; Ransdell, L. A Systematic Review of Information and Communication Technology–Based Interventions for Promoting Physical Activity Behavior Change in Children and Adolescents. *J. Med. Internet Res.* **2011**, *13* (3), e48. https://doi.org/10.2196/jmir.1533.
12. Orte, C.; Sarrablo-Lascorz, R.; Nevot-Caldentey, L. Systematic Review on Affective-Sexual Education Programs and Interventions for Adolescents. *REICE. Revista Iberoamericana Sobre Calidad, Eficacia y Cambio en Educacion*. June 27, 2022, pp 145–164. https://doi.org/10.15366/reice2022.20.3.008.
13. Espada, J. P.; Guillén-Riquelme, A.; Morales, A.; Orgilés, M.; Sierra, J. C. Validation of an HIV and Other Sexually Transmitted Infections Knowledge Scale in an Adolescent Population. *Aten. Primaria* **2014**, *46* (10), 558–564. https://doi.org/10.1016/j.aprim.2014.03.007.
14. Carratalá, E.; Espada, J. P.; Orgilés, M. Conocimientos y Actitudes Hacia El VIH/SIDA: Diferencias Entre Adolescentes Españoles Con Padres Casados y Divorciados. *Salud Ment.* **2013**.
15. Espada, J. P.; Huedo-Medina, T. B.; Orgilés, M.; Secades, R.; Ballester, R.; Remor, E. Psychometric Properties of the HIV/AIDS Knowledge Scale for Spanish Adolescents (HIV-KS) / Propiedades Psicométricas de La Escala de Conocimientos Sobre VIH/SIDA Para Adolescentes (VIH-KS). *Heal. Addict. y Drog.* **2009**, *9* (2). https://doi.org/10.21134/haaj.v9i2.42.
16. Abramowitz, J. S.; Deacon, B. J.; Valentiner, D. P. The Short Health Anxiety Inventory: Psychometric Properties and Construct Validity in a Non-Clinical Sample. *Cognit. Ther. Res.* **2007**, *31* (6), 871–883. https://doi.org/10.1007/s10608-006-9058-1.
17. Vallejo-Medina, P.; Saavedra-Roa, A.; Gómez-Lugo, M.; Morales, A.; Abello-Luque, D.; García-Montaño, E.; Garavito-Zamudio, C. G.; Espada, J. P. Adaptación, Fiabilidad y Validez de Una Versión Breve de La

Multicomponent AIDS Phobia Scale (MAPS) En Adolescentes Colombianos. *Rev. Iberoam. Psicol. y Salud* **2018**, *9* (1), 42–57. https://doi.org/10.23923/j.rips.2018.01.014.

18. Tamarit, A.; Schoeps, K.; Peris-Hernández, M.; Montoya-Castilla, I. The Impact of Adolescent Internet Addiction on Sexual Online Victimization: The Mediating Effects of Sexting and Body Self-Esteem. *Int. J. Environ. Res. Public Health* **2021**, *18* (8), 4226. https://doi.org/10.3390/ijerph18084226.
19. Pampati, S.; Johns, M. M.; Szucs, L. E.; Bishop, M. D.; Mallory, A. B.; Barrios, L. C.; Russell, S. T. Sexual and Gender Minority Youth and Sexual Health Education: A Systematic Mapping Review of the Literature. *J. Adolesc. Heal.* **2021**, *68* (6), 1040–1052. https://doi.org/10.1016/j.jadohealth.2020.09.032.
20. McCabe, E. M.; McDonald, C.; Connolly, C.; Lipman, T. H. Factors Associated With School Nurses' Self-Efficacy in Provision of Asthma Care and Performance of Asthma Management Behaviors. *J. Sch. Nurs.* **2021**, *37* (5), 353–362. https://doi.org/10.1177/1059840519878866.
21. Corral-Gil, G. de J.; García-Campos, M. de L.; Herrera-Paredes, J. M. Asertividad Sexual, Autoeficacia y Conductas Sexuales de Riesgo En Adolescentes: Una Revisión de Literatura. *ACC CIETNA Rev. la Esc. Enfermería* **2023**, *9* (2), 168–177. https://doi.org/10.35383/cietna.v9i2.851.
22. Morales, A.; Carratalá, E.; Orgilés, M.; Espada, J. P. UN ESTUDIO PRELIMINAR DE LA EFICACIA DE UN PROGRAMA DE PROMOCIÓN DE LA SALUD SEXUAL EN ADOLESCENTES CON PADRES DIVORCIADOS A PRELIMINARY STUDY OF THE EFFECTIVENESS OF A PROGRAM TO PROMOTE SEXUAL HEALTH AMONG ADOLESCENTS WITH DIVORCED PARENTS. *Heal. Addict.* **2017**, *17* (1), 37–44.
23. Bossonario, P. A.; Ferreira, M. R. L.; Andrade, R. L. de P.; Sousa, K. D. L. de; Bonfim, R. O.; Saita, N. M.; Monroe, A. A. Factores de Riesgo de Infección Por VIH Entre Adolescentes y Jóvenes: Revisión Sistemática. *Rev. Lat. Am. Enfermagem* **2022**, *30* (spe). https://doi.org/10.1590/1518-8345.6264.3695.
24. Bonilla-Algovia, E.; Rivas-Rivero, E.; Pascual Gómez, I. Mitos Del Amor Romántico En Adolescentes: Relación Con El Sexismo y Variables Procedentes de La Socialización. *Educ. XX1* **2021**, *24* (2). https://doi.org/10.5944/educxx1.28514.