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Psychometric Properties of the Sexual Self-Concept Inventory for Early Adolescent Girls*

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Topic: Promotion and prevention.

Contribution to the discipline: Nursing, responsible for the programs on the prevention and promotion of sexual and reproductive health, regards adolescence as a stage entailing specific changes, including the moment when sexual maturity is reached and as a period of vulnerability when they experience various emotions. Therefore, determining the sexual self-concept using the Sexual Self-Concept Inventory for early adolescent girls in Spanish allows us to understand teenage girls' expectations, behaviors, and expressions, thereby protecting them from potential risks, such as sexuality-related behaviors or feelings, through timely preventive actions.

Abstract

Objective: To establish the validity and dependability of the Sexual Self-Concept Inventory (SSCI) for early adolescent girls in Spanish among the Colombian population of Santander. **Materials and methods:** Methodological study with samples used for the theoretical construct validity of the study's dimensions and internal consistency. The sample consisted of 308 adolescent girls aged between 10 and 14 from two schools in Girón, Santander, Colombia. **Results:** Inventory of 34 items with three dimensions; exploratory factor analysis confirmed the three factors with a total variance of 43.261%. The instrument reported internal consistency of $\alpha = 0.89$ for the following dimensions: sexual arousability (0.908), sexual agency (0.812), and negative sexual affect (0.572). **Conclusions:** The SSCI in Spanish is dependable enough to evaluate a person's sexual behaviors or feelings and comprehend the sexual behavior of adolescent girls.

Keywords (Source: DeCS)

Adolescent; women; psychometrics; sexual health; reproducibility of results; validity and reliability; schools.

4 Propiedades psicométricas: inventario de autoconcepto sexual en mujeres adolescentes en etapa temprana*

* Financiación: proyecto financiado por la Universidad Cooperativa de Colombia y aprobado por Convocatoria Interna CONADI: validación psicométrica del instrumento inventario del autoconcepto sexual (SSCI) en adolescentes en etapa temprana. Código: INV2477

Resumen

Objetivo: establecer la validez y la confiabilidad del instrumento *autoconcepto sexual en mujeres adolescentes en etapa temprana (SSCI)* —versión en español— en población colombiana, más exactamente en Santander. **Material y métodos:** estudio metodológico. Se emplearon pruebas para la validez del constructo teórico de sus dimensiones y consistencia interna con una muestra de 308 mujeres adolescentes, de 10 a 14 años, de dos instituciones educativas de Girón, Santander, Colombia. **Resultados:** inventario de 34 ítems con tres dimensiones; mediante un análisis factorial exploratorio, se confirmaron los tres factores con una varianza total de 43,261 %. El instrumento reportó una consistencia interna de $\alpha=0,89$ para las dimensiones de excitabilidad sexual (0,908), agencia sexual (0,812) y efecto negativo sexual (0,572). **Conclusiones:** *el inventario de autoconcepto sexual (SSCI) en mujeres adolescentes escolarizadas en etapa temprana*—versión en español— es confiable para evaluar los comportamientos, sentimientos sexuales sobre sí mismo y comprender la conducta sexual de las adolescentes.

Palabras clave (Fuente DeCS)

Adolescentes; mujeres; psicometría; salud sexual; reproducibilidad de los resultados; confiabilidad y validez; instituciones académicas.

Propriedades psicométricas do Inventário de Autoconceito Sexual em mulheres na adolescência precoce*

* Projeto financiado pela Universidad Cooperativa de Colombia, aprovado pela Chamada Interna CONADI: "Validação Psicométrica do instrumento Inventário do autoconceito sexual (SSCI) na adolescência precoce". Código: INV2477.

Resumo

Objetivos: estabelecer a validade e confiabilidade do instrumento "Autoconceito sexual em mulheres na adolescência precoce" (Sexual Self-Concept Inventory, SSCI), versão em espanhol, em população colombiana de Santander. **Material e métodos:** estudo metodológico em que foram utilizados testes para validar o construto teórico de suas dimensões e consistência interna com uma amostra de 308 mulheres adolescentes de 10 a 14 anos de duas instituições educacionais de Girón, Santander, Colômbia. **Resultados:** inventário de 34 itens com três dimensões; a partir da análise fatorial exploratória, confirmam-se os três fatores com uma variância total de 43,261 %; o instrumento relatou uma consistência interna de $\alpha = 0,89$ para as dimensões de excitabilidade sexual (0,908), agência sexual (0,812) e efeito negativo sexual (0,572). **Conclusões:** o inventário de autoconceito sexual (SSCI), versão em espanhol, em mulheres na adolescência precoce escolarizadas é confiável para avaliar os comportamentos e sentimentos sexuais sobre si, e compreender o comportamento sexual das adolescentes.

Palavras-chave (Fonte: DeCS/MeSH)

Adolescente; mulheres; psicomетria; saúde sexual; reprodutibilidade dos testes; confiabilidade e validade; instituições acadêmicas.

Introduction

Issues of sexual and reproductive health are complex, particularly during adolescence. They represent a global cause for concern, especially in developing countries (1). Research has focused on sexual relations and their results, namely sexually transmitted diseases, unintended pregnancies, and HIV (2). In low and average-income countries, the pregnancy rate among girls younger than 15 is roughly one million (3), hence the need for new approaches to preventing pregnancy before the middle or late adolescence, focused on early adolescent women aged between 10 and 14. Girls in this age range face the biggest obstacles to achieving their full potential and development and display a lower ability to make good life decisions related to their sexual and reproductive health (4).

This population of early adolescent girls is generally considered sexually inactive but is indeed the opposite (5). A study in Taiwan revealed that this population displayed a high level of sexual activity regarding kisses, caresses, and contemplating the possibility of sexual relations (6). These results showed that adolescent girls were conscious of their erotic feelings and sexual desire (6).

According to the social cognitive theory, a person's self-efficacy and belief in their ability to adopt a particular behavior in a specific situation are related to their skills and knowledge of their actual conduct (7). Therefore, adolescents' favorable opinions of themselves as sexual beings improve their ability to identify sexual risks and take actions to ensure the safety of their sexual health and well-being (8). This way, the consolidation and development of the sexual self-concept during early adolescence become essential.

The sexual self-concept comprises sexual behaviors, attitudes, feelings, self-esteem, and self-confidence (9). Moreover, it is a multidimensional construct that includes negative or positive perceptions and feelings about oneself as a sexual being (8). During adolescence, a person's sexual self-concept evolves along with their development and growth and becomes established in future sexual conduct (10).

Presently, scales have been devised to analyze the sexual self-concept among women. Nonetheless, despite it being necessary, few studies have focused on measuring the sexual self-concept as a predictor of sexual activity among early adolescent girls (10, 11).

In healthcare, measurements carried out in the biophysical dimension have been predominant, but the biophysical approach does not consider the subjective attributes of the different phenomena (12). Consequently, there arises the need for instruments that evaluate the subjective properties of constructs and dimensions, which are necessary to direct actions for treating, preventing, or promoting health. Scales allow for analyzing the unmeasurable physical, social, and psychological dimensions through observation. The information must be obtained validly and reliably (13).

In our search for instruments, particularly those related to the sexual and reproductive health of early adolescent girls, we performed the transcultural adaptation of the Sexual Self-concept Inventory (SSCI) in English (14) to analyze how prepared the girls were in terms of sexual maturity. This instrument helps predict sexual health and well-being, including positive affect and the assessment of sexual desire (15, 16). Previous studies showed that sexual arousability and agency were linked to sexual self-esteem and future orientation toward positive sexuality, with a low desire to engage in sexual relations (5).

Sexual arousability is the feeling or right to engage in sexual activities. When adolescent women have a people-oriented perspective on sexuality, pregnancy and early-first-sexual-relation rates diminish. The sexual agency represents the positive assessments of sexuality through thoughts, feelings, behaviors, and body perceptions within the sexual context. Generally, adolescents with higher sexual self-esteem feel safer in sexuality-related situations (5, 10).

Sexual anxiety refers to tensions, nuisances, and negative assessments of sexuality. It manifests through abstinence, low possibility of engaging in sexual relations soon, not having a partner, or taking very little part in erotic expressions. As mentioned earlier, this SSCI is valid for analyzing the opinions of early adolescent girls on their sexuality and sexual behavior and could be helpful in healthcare studies and risk-related decision-making (5, 10, 17).

This study aims to establish the validity and reliability of the SSCI in Spanish among the Colombian population of Santander.

Materials and methods

In this methodological study, we used psychometric samples to determine the reliability and dependability of the SSCI in Spanish. Reliability refers to the accuracy with which the instrument evaluates the attributes for which it was built. Those attributes show a correlation between the items that make up the construct, which need to be homogenous (18). Dependability is the ability of an instrument to consistently measure an element reflected by Cronbach's alpha coefficient, which reveals how far the items go in measuring the construct. This property is related to the validity of the instrument (19).

Participants

Participants in this study comprised adolescent girls aged between 10 and 14. A nonprobability convenience sample was used, with a sample parameter of between 5 and 10 persons per instrument item (20). The sample included 308 early adolescent schoolgirls from two institutions in the urban area of Girón municipality in Santander, Colombia. The girls had to fulfill the following criteria: be early adolescents aged between 10 and 14 and take part in the study voluntarily with informed consent from their parents. We did not consider adolescent girls with cognitive disorders or sensory alterations.

Instrument

We applied the Spanish version of the SSCI obtained through a methodological process of transcultural adaptation (14) of the SSCI for early adolescent girls (5). This inventory comprises three dimensions: sexual arousability (17 items), sexual agency (ten items), and negative sexual affect (seven items). We used a Likert-scale questionnaire with six possible answers to measure the 34 items: the higher the score, the better the sexual self-concept.

Procedure

Once we obtained the parents' informed consent and the adolescents' assent, we administered the SSCI for early adolescent girls in classrooms during periods agreed upon with the two public schools in Girón, Santander, thereby ensuring the reliability of the participants' data.

Data analysis

We carried out a descriptive analysis of the sociodemographic variables using percentage distribution. We then determined the results of the items and the median, maximum/minimum score, and standard deviation by descriptive statistics. We calculated the reliability of the SSCI for early adolescent girls in Spanish using Cronbach's alpha coefficient, which reflected an excellent internal consistency, ranging between 0.7 and 0.9 (21). As part of the process of adapting the instrument, we employed the correlation matrix to confirm the proper use of factorial analysis (FA), which integrates the variability of the items and correlations. When there are various item pairs with correlations above 0.3, we can perform the FA. However, we employ statistical techniques such as the reverse correlation, Bartlett's test, or the Kaiser Meyer Olkin (KMO) test when it is not easy to notice. The latter provides enough information to decide whether we could use FA as a statistical strategy in scale validation (22).

Ethical considerations

The research protocol was approved by the bioethics committee at Universidad Cooperativa de Colombia and authorized by the schools in Girón, following the international guidelines for bioethical research on human beings and the WMA Declaration of Helsinki (23). Moreover, according to Law 911 of 2004 (24) and Resolution 8430 of 1993 (25), Colombia's Health Department deemed this research risk-free as it did not involve any medical treatments or manipulation of the participants' behavior. Initially, we requested institutional permission at a management level. Then, we contacted parents to inform them about our objectives and procedures, emphasizing that participation was voluntary and that data would remain confidential. We also informed them that they could withdraw their

children from the study at any time without any legal or social consequences and allow the children to take part in the study only by signed informed consent. At the end of this process, we called the participants to obtain their informed consent, providing them with the same information above, i.e., reliability of the information, the anonymity of the answers, and the possibility to withdraw from the study voluntarily at any time. In addition, we assured them that their data would not appear in any reports, presentations, or academic publications related to the study. As for the psychometric process related to the Spanish version of the instrument, we obtained permission from the instrument's rightful creator.

Results

We administered the Spanish version of the SSCI to 308 adolescent girls from two schools. The girls were between 10 and 14 years old and had an education level that ranged between sixth (31%), seventh (32%), eighth (22%), ninth (10%), and tenth grade (4%).

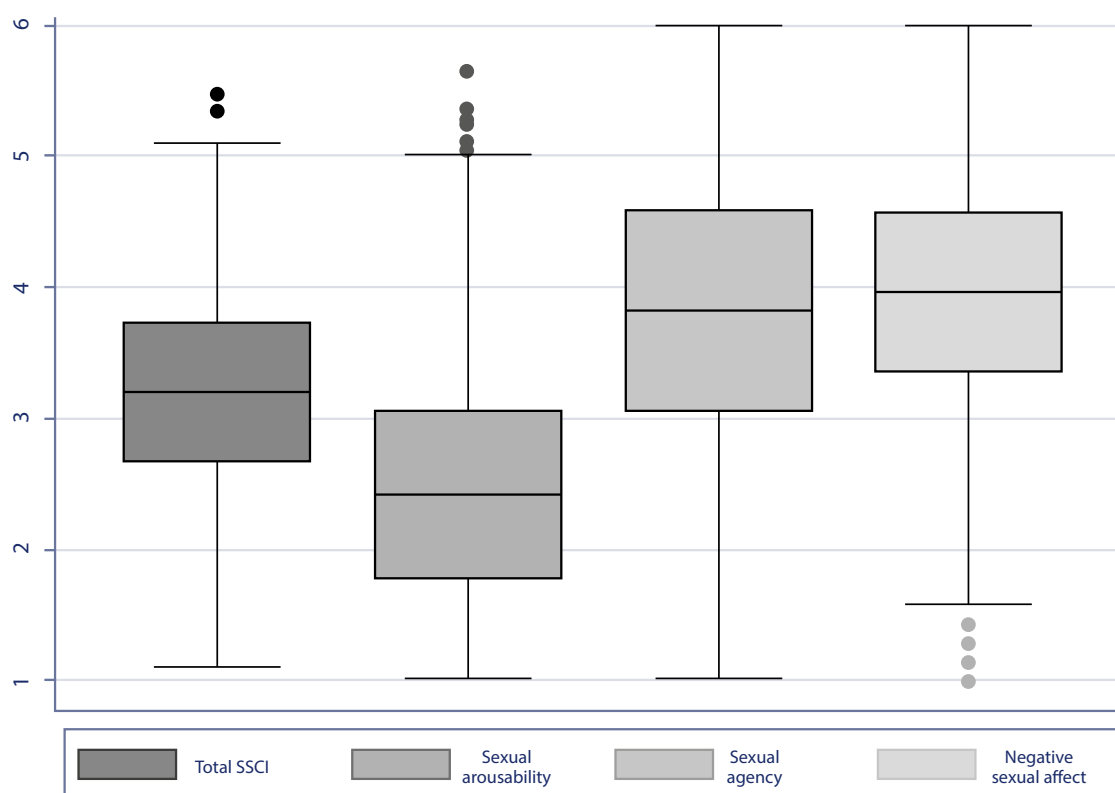
We analyzed the baseline Cronbach's alpha to establish the internal consistency of the instrument. For the full scale, it was 0.89, whereas, for factors one, two, and three, it was 0.908, 0.812, and 0.572, respectively. We noticed that factors one and two displayed an acceptable coefficient, while factor three displayed a lower score, which can be explained by the fact that it had fewer items than the other factors (Table 1).

Table 1. Statistics of total scores, inventory, and dimensions

Scale/Dimensions	Descriptive Statistics					Cronbach's Alpha	
	N	Min.	Max.	M	DT	Value	No elements
SSCI	308	1.11	5.47	3.17	0.80	0.89	34
Sexual arousability	308	1	5.64	2.52	0.97	0.91	17
Sexual agency	308	1	6	3.75	1.12	0.81	10
Negative sexual affect	308	1	6	3.90	0.97	0.57	7

Source: Own elaboration

The Kolmogorov-Smirnov test for assessing normality was significant for the SSCI ($p = .001$). The median score on the SSCI among the participant population was 3.17, while the sexual arousability factor was 2.52, the sexual agency factor was 3.8, and the negative sexual affect factor was 3.9 (Figure 1).



Source: Own elaboration

We used the sample adequacy tests from the KMO data matrix (sample adequacy measure) and Bartlett's test of sphericity to analyze the data. In our case, the KMO indicated that the variables measured common factors with a value of 0.85 and a Bartlett test with $p = 0.000$. Thus, the data was suitable for the analysis.

Using factor analysis with the extraction of the principal components and varimax rotation of the three factors, we considered the items with a value higher than 0.4. When revising the communality of the 34 items, we discovered that not all of them corresponded with the initial factor (Table 2).

Table 2. Results of the exploratory factor analysis with three factors

	ITEMS	F1	F2	F3
ES1	I sometimes think I'd like to try doing the sexual things that my friends are doing with their boyfriends	0.627	0.001	-0.155
ES2	When I kiss a boy, I get hot	0.664	0.142	0.092
ES3	I would really like to touch a boyfriend if we were left alone together	0.721	0.109	-0.069
ES4	I sometimes want to know how different types of sex feel	0.663	0.142	-0.092
ES5	If I'm going to see a guy I like, I like to dress sexy	0.427	0.427	-0.063
ES6	If a guy kisses me, I also want him to touch my body	0.624	0.098	-0.017
ES7	When I flirt with a guy, I like to feel him up	0.378	0.457	-0.028

	ITEMS	F ₁	F ₂	F ₃
ES8	Sometimes I dress sexy to get attention from guys	0.370	0.324	-0.023
ES9	If I were to kiss a guy, I'd get really turned on	0.557	0.171	0.106
ES10	There are things about sex I want to try	0.811	0.45	-0.158
ES11	If a boy kisses me, my body feels good	0.571	0.385	-0.126
ES12	I enjoy talking about sex or talking sexy with boys I know really well	0.724	0.190	-0.087
ES13	If I were kissing and touching a guy, I would get hyped, real excited	0.772	0.187	0.008
ES14	I enjoy talking about sex with my girl friends	0.727	0.112	0.062
ES15	It's okay to feel up on a guy	0.328	0.664	-0.196
ES16	I like it when a guy tells me I look good	0.114	0.653	-0.138
ES17	I think I'm ready to have sex	0.693	-0.043	-0.117
AS1	Girls always wonder what sex is going to be like the first time	0.499	0.473	-0.003
AS2	I sometimes think about who I would want to have sex with	0.680	0.307	-0.012
AS3	When I decide to have sex with a guy, it will be because I wanted to have sex and not because he really wanted me to have sex with him	0.067	0.585	-0.116
AS4	Girls sometimes have sex because they're curious and want to see what it's like	0.359	0.498	0.082
AS5	Sex is best with a guy you love	0.090	0.679	0.142
AS6	I like to let a guy know when I like him	0.258	0.461	-0.062
AS7	If I have sex, my friends will want to know all about it	0.396	0.379	0.330
AS8	If I had sex with a guy, I would be running the risk of being played (taken advantage of)	0.013	0.590	0.047
AS9	Flirting is fun, and I am good at it	0.440	0.323	-0.042
AS10	If I have sex with a guy, I would worry that I could get my feelings really hurt	0.092	0.681	0.252
ESN1	If I kiss a guy I don't really know, I'm afraid of what people will think about me	-0.045	0.414	0.257
ESN2	Sex is nasty	-0.018	-0.116	0.640
ESN3	Sex isn't fun for girls my age	-0.111	-0.039	0.534
ESN4	I would be scared to be really alone with a boyfriend	-0.111	-0.135	0.490
ESN5	Some girls have sex just to be accepted or popular	-0.036	0.398	0.534
ESN6	I think I am too young to have sex	-0.397	0.264	0.416
ESN7	If I have sex, my friends will want to know all about it	0.329	0.262	0.496

Note: F₁ = Sexual arousability, F₂ = Sexual agency, F₃ = Negative sexual affect.

Source: Own elaboration

The total explained variance for the factor variables stands at 43.261% for the 34 items that make up the SSCI, as seen below in Table 3.

Table 3. Total explained variance for the factor variables

Component	Initial self-values			Rotation sums of squared loadings		
	Total	Variance %	Accumulated %	Total	Variance %	Accumulated %
1	9.605	28.249	28.249	7.762	22.828	22.828
2	3.335	9.808	38.057	4.835	14.222	37.050
3	1.769	5.204	43.261	2.112	6.211	43.261

Extraction method: Principal component analysis.

Source: Results from the statistical package SPSS V.

Considering that for the sexual arousability factor, which included items between 1 and 17 in the original version, three items, namely, 7, 11, and 15, are now excluded and subsequently assigned to factor two. In addition, items AS1, AS2, AS7, and AS9 are moved from factor two (sexual agency) to factor one, leaving factor one with 18 items. Therefore, factor two keeps six original items, plus items 7, 11, and 15 from factor one, and items ESN1 and ESN5 from factor three (negative sexual affect), totaling eleven items. Lastly, factor three keeps five items from the original scale and item ES5, which has a similar value within two factors left there according to the original scale. Table 4 shows the scale with the rearranged items.

Table 4. Order of the items according to their values and the corresponding factor

SEXUAL AROUSABILITY DIMENSION		SEXUAL AGENCY DIMENSION		NEGATIVE SEXUAL AFFECT DIMENSION	
No.	Items	No.	Items	No.	Items
ES1	I sometimes think I'd like to try doing the sexual things that my friends are doing with their boyfriends	AS3	When I decide to have sex with a guy, it will be because I wanted to have sex and not because he really wanted me to have sex with him	ESN2	Sex is nasty
ES2	When I kiss a boy, I get hot	AS4	Girls sometimes have sex because they're curious and want to see what it's like	ESN3	Sex isn't fun for girls my age
ES3	I would really like to touch a boyfriend if we were left alone together	AS5	Sex is best with a guy you love	ESN4	I would be scared to be really alone with a boyfriend
ES4	I sometimes want to know how different types of sex feel	AS6	I like to let a guy know when I like him	ESN6	I think I am too young to have sex
ES5	If I'm going to see a guy I like, I like to dress sexy	AS8	If I had sex with a guy, I would be running the risk of being played (taken advantage of)	ESN7	If I have sex, my friends will want to know all about it

SEXUAL AROUSABILITY DIMENSION		SEXUAL AGENCY DIMENSION		NEGATIVE SEXUAL AFFECT DIMENSION	
No.	Items	No.	Items	No.	Items
ES6	If a guy kisses me, I also want him to touch my body	AS10	If I have sex with a guy, I would worry that I could get my feelings really hurt		
ES8	Sometimes I dress sexy to get attention from guys	ES7*	When I flirt with a guy, I like to feel him up		
ES9	If I were to kiss a guy, I'd get really turned on	ES11*	If a boy kisses me, my body feels good		
ES10	There are things about sex I want to try	ES15	It's okay to feel up on a guy		
ES12	I enjoy talking about sex or talking sexy with boys I know really well	ESN1*	If I kiss a guy I don't really know, I'm afraid of what people will think about me		
ES13	If I were kissing and touching a guy, I would get hyped, real excited	ESN5*	Some girls have sex just to be accepted or popular		
ES14	I enjoy talking about sex with my girl friends				
ES16	I like it when a guy tells me I look good				
ES17	I think I'm ready to have sex				
AS1 *	Girls always wonder what sex is going to be like the first time				
AS2 *	I sometimes think about who I would want to have sex with				
AS7 *	If I have sex, my friends will want to know all about it				
AS9 *	Flirting is fun, and I am good at it				
Subtotal: 18 items		Subtotal: 11 items		Subtotal: 5 items	

*Items from the original scale, rearranged

Source: Own elaboration

Discussion

The thorough methodological process developed throughout this psychometrics-based study allows us to evaluate the SSCI in Spanish, for which we frequently used Cronbach's alpha coefficient. This enabled us to identify the level of accuracy of the adaptation process, after which we would be able to interpret the scores obtained appropriately to generate more accurate, unquestionable knowledge (26, 27).

The sexual self-concept has been considered a predictor of the sexuality of early adolescent girls (6), departing from the definition of the sexual self-concept as a person's perception of their sexual self (8). In present times, sexual self-concept scales in the adoles-

cent population have been developed (5), which require validation within the various contexts that involve early adolescents. That is why our study in Colombia, whose sample of 308 participants from a school environment was lower than the one in Taiwan (590) and higher than the one in New York (180), highlighted the fact that the instrument obtained similar reliability (5) overall, although lower when it came to the negative sexual affect dimension (28). The explained variance in our study (43.261%) is different from the one in the New York version, reflecting a higher development of the scale. In addition, we did not include data on puberty-, family- or religious-related development.

The SSCI for early adolescent girls adapted in this study represents a tool to analyze dimensions like sexual arousability, which has been studied and referred to as a trait and component of sexual response, aiding the development of a positive assessment of sexual ability. Knowledge of its response tendency will allow us to evaluate interactions with others and the pleasant experience of sexuality with improvements in sexual self-esteem (29).

The sexual self-concept significantly influences knowledge related to sexual health, as it represents a mediatory factor for the protection and treatment of adolescents' sexual behaviors (28). A different study (30) has analyzed the direct correlation between the positive/negative sexual self-concept and safe intercourse, enabling people to adopt healthy sexual behaviors. According to other authors, self-concept and self-efficacy contribute to developing self-care conduct, motivating people to adopt behaviors beneficial to their health (31).

The results showcase good reliability of the factors, with the exploratory factor analysis reproducing the structure in the original version of the scale, which indicated that it was suitable for use among the Colombian population. The results are promising; thus, further research on other validity evidence could make the Colombian version of the scale more solid, following the established psychometric standards.

Conclusions

The SSCI, designed as a sexual predictor among early adolescent girls, displays an excellent psychometric quality in our study. Further studies on its predictive capacity, with evidence of validity based on the link with other variables, can contribute to this instrument becoming useful for predicting sexual conduct in diverse cultural contexts.

Our adapted instrument helps develop research and comparison with other similar instruments, including the participation of parents and teachers in interventions related to sexual and reproductive health.

In the results obtained through exploratory factor analysis, the items were rearranged based on the observed interrelations and higher affinity with the respective factor. This modified the original scale, which means that further studies should be conducted using the adjusted scale and comparing the results to verify the scale's internal structure.

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Conflicts of interest: None declared.

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