

KNOWLEDGE OF AND ATTITUDES TOWARD SEXUAL AND REPRODUCTIVE HEALTH AMONG COLLEGE STUDENTS

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Abstract

Introduction: Knowledge provides the foundation for values, attitudes and behavior. Knowledge about sexual and reproductive health (SRH) and positive attitudes are essential for implementing protective behaviors. **Objectives:** The aim of this study was to evaluate SRH knowledge and attitudes in college students and their association with sexual and reproductive behaviors.

Methods: A cross-sectional study was conducted in a sample of 1946 college students. The data were collected using a self-report questionnaire on the sociodemographics characteristics of the sample, an inventory on SRH knowledge and an attitude scale, and were analyzed with descriptive and inferential statistics (ANOVA and Pearson's correlation).

Results: The sample was 64% female and 36% male, with a mean age of 21 years. The majority were sexually active and used contraception. The SRH knowledge was moderate (22.27 ± 5.79 ; maximum score=44), while the average SRH attitude score was more favorable (118.29 ± 13.92 ; maximum score=140). Female and younger students studying life and health sciences had higher ($p < 0.05$) SRH knowledge and attitude scores. The consistent use of condom and health care surveillance were highly dependent on the students' SRH knowledge and attitudes. Engagement in sexual risk behaviors was associated with lower scores for these variables.

Conclusions: Strategies to increase SRH knowledge and attitudes are important tools for improving protective behaviors, especially with respect to contraception, health care surveillance and exposure to sexual risk. Older males studying topics other than life sciences should be a priority target for interventions due to their higher sexual risk.

Keywords: Attitude; Knowledge; Sexual and reproductive behavior; College students

Introduction

Sexual and reproductive health (SRH) is an essential part of public health and can considerably influence general well-being and quality of life⁽¹⁾. The promotion of SRH is of particular importance in college students because this population is at high risk for Sexually transmitted infections (STI) and unintended pregnancies^(2,3). International

surveillance reports demonstrate trends of a high prevalence of STIs among young adults, namely, HIV, chlamydia, trichomoniasis and HPV^(4,5). Portugal is among the countries with the highest prevalence of HIV, with people aged 20 to 24 years accounting for 11.2% of reported cases⁽⁵⁾, and the prevalence of HPV infection is 28.8% for females aged 18 to 24 years⁽⁶⁾. In Portugal, in 2015, 2296 teenagers (12-19 years) were mothers⁽⁷⁾, and higher rates of abortion were observed in young adult women (22.4% among women 20 to 24 years old and 20.8% among women 25 to 29 years old)⁽⁸⁾. In the 2014/15 academic year, 44 659 students were enrolled in universities and colleges in Portugal⁽⁹⁾. A significant percentage of students engage in risky sexual behaviors such as using drugs or alcohol during sexual activity^(10,11,12), having sex with multiple and casual partners^(13,14), and inconsistently using condoms^(3,15).

Understanding the factors (e.g., knowledge, attitudes and behavioral skills) that influence the SRH behaviors of college students is important because they have a significant impact on sexual decision making, and behavior and educational programs can significantly improve these factors^(15,16). Knowledge provides a foundation for human action; this is a central concept in many psychological theories and is commonly used as the theoretical basis for effective sex and STD/HIV education programs. Knowledge may also transform behavior indirectly by affecting values, attitudes, perceptions of norms and even perceptions of self-efficacy. However, even though knowledge may provide a foundation, greater knowledge may not necessarily assure responsible behavior, because knowledge alone is not sufficient⁽¹⁶⁾. According to several models that aim to explain changes in health behavior, attitudes are among the most important theoretical constructs affecting behavior^(17,18). The attitude toward a behavior is the extent to which a person has a favorable or unfavorable appraisal of that behavior⁽¹⁹⁾. Attitudes are formed through life experiences and are learned behaviors from others. In contemporary language, attitudes are defined as complex, multidimensional constructs comprising cognitive, affective, and behavior components. The three components reinforce each other to form a joint structure that tends to remain stable⁽¹⁷⁾. The relationship between knowledge, attitudes and behavior is complex. However, several studies suggested that information and positive attitudes towards condom use and other forms of contraception has a strong association with consistent condom use ^(19,20) and with

condom negotiation skills⁽²¹⁾. College students who are well informed and have more positive attitudes and skills tend not to accept sexual risks^(15,21).

Understanding college students' SRH knowledge and attitudes is important for planning effective educational programs in universities. The aim of this study was to evaluate SRH knowledge and attitudes in college students and their association with sexual and reproductive behaviors.

Materials and methods

Design and sampling

A cross-sectional study was conducted in a sample of 1946 college students (64% female and 36% male) with a mean age of 21 years attending a university in Portugal in the 2012/2013 academic year. Students were recruited by direct solicitation in the classroom, and participation was voluntary. Classes were selected for their representation of the scientific areas of study and for the different years of study of the students. The data were collected with an anonymous self-administered survey.

Measures

We collected information on demographic characteristics: gender, age (≤ 19 , 20-24, and ≥ 25 years), nationality, place of childhood (urban, rural), area of studies, parental education level (9 years, 10 to 12 years, and university) and monthly family income (<1000 US\$; 1000-2000 US\$; and >2000 US\$). Information on previous sexual behavior was collected: had sex in the last twelve months, use of sexual health care services, use of a contraceptive method, having sexual intercourse consistently using a condom in the last 12 months, sources of information on SRH, having sex while under the influence of alcohol or drugs and having sex with casual partners, having had an HIV test and having had an STI.

Knowledge about SRH was measured using an inventory-based self-report questionnaire made up of 44 items developed by the authors for the present study. The SRH knowledge inventory was structured in four dimensions based on knowledge of the students' social environments and on a literature review of SRH: (1) information related to sexual physiology and conception, (2) methods of contraception, (3) STIs and STI prevention, and (4) SRH surveillance. Items were

rated using three response options: true, false and don't know. Correct answers were coded as one, and incorrect or uncertain responses were coded as zero. The total score ranged from 0 to 44 points. The reliability of the knowledge inventory was assessed using Kuder-Richardson's formula 20 coefficient (KR20), an analogue to Cronbach's alpha and is used as a measure of internal consistency in studies with dichotomous scales⁽²²⁾. The result was KR20= 0.78, confirming the adequate internal consistency of the instrument.

Attitudes towards SRH were measured using a scale composed of 20 items designed specifically for the study. The SRH attitude scale had seven response options (1 - *strongly disagree* to 7 - *strongly agree*), which assessed five theoretical dimensions of SRH attitudes (responsible sexuality, preventive attitudes, attitudes towards STIs, attitudes towards condoms, and hedonism). The results vary between 20 and 140 points, with the highest score indicating more positive SRH attitudes. The scale revealed good internal consistency (Cronbach's alpha = 0.82).

Data analysis

The data were analyzed using SPSS software (version 22.0, 2012; SPSS, Inc., Chicago, IL, USA). The associations between the SRH knowledge scores and SRH attitudes and sociodemographic and academic characteristics and sexual behaviors were analyzed using one-way ANOVA. The relationships between knowledge and SRH attitudes were established using Pearson's correlations. Missing cases were omitted from the analysis. Statistical significance was set at a p value of less than 0.05.

Ethical considerations

The study was authorized by the Comissão de Proteção de Dados (National Data Protection Committee) (Autorização N° 7409/2012) and was sanctioned by the Ethics Committee (Opinião N° 2/2012) of the University where the study was conducted.

Results

The average age of the students surveyed was 20.74±2.32 years, and 64% were female. Approximately two-thirds (63.4%) were students in life sciences courses. Their childhood residence was either rural (60%) or urban (40%). Their household

income was generally low (57%<1000 US\$/month). Their parents' levels of education were also low: 54.5% of the mothers and 61.6% of the fathers only had nine years of education.

The majority of students (76.9%) was sexually active and used contraception (96.7%). The most commonly used contraceptive methods were hormonal contraception (43.7%) and condoms (21.8%). Only 39.5% of the participants reported using condoms consistently. The rate of students who have previously used an SRH service was 22.2%, and women used these services more than men (♀=30.4% vs ♂=7.6%, $p<0.0001$). Only 14.5% of students had been tested for HIV. STIs were reported by only 1.3% of the students. The most common sources of SRH information were friends (46.1%), the internet (45.3%), and teachers (42.7%). Nursing professionals have a secondary role in transmitting information (24.2%). A considerable proportion of students reported engagement in risk behaviors, such as having intercourse under the influence of alcohol (33.0%) or drugs (9.7%) and having intercourse with occasional partners (32.0%).

The mean total SRH knowledge score was 22.76 ± 5.79 (the score ranges from 0 to 44) (table 1). The contraception knowledge score was slightly higher than the middle of the scale (8.42 ± 2.44 , maximum of the score was 16), and the STI knowledge score was slightly lower than the middle of the scale (6.05 ± 2.73 , maximum score 16). The worst knowledge scores were observed for SRH surveillance. This dimension of knowledge was composed of four questions related to HPV vaccination and vaginal cytology. Even considering that these aspects are more related to female health surveillance, the mean score was below the middle of the scale.

TABLE 1

Female students had higher levels of knowledge ($p<0.001$). Significant differences were also observed in knowledge among students belonging to different age groups. Younger students had higher scores ($p<0.05$) for the general aspects of sexual physiology, contraception and, consequently, had higher total SRH knowledge

scores. The main difference observed among students of different ages was that older students (≥ 25 years) were less informed than students aged 20-24 years or ≤ 19 years. The scientific area of study also influenced the knowledge of these students. Those majoring in life and health sciences presented with higher ($p < 0.001$) knowledge scores than those studying other areas.

Generally, students held positive attitudes (table 1) clearly above the middle of the scale (118.28 ± 13.92). As observed for the knowledge scores, all dimensions had a similar trend. The effects of gender, age and area of study observed for the knowledge was generally also observed for the attitude. Only the attitude towards hedonism had a different pattern, showing that gender, older age and studying non-life sciences had a more significant influence on hedonic perspectives of sex.

The relationship between the self-reported sexual behaviors and the global SRH knowledge and attitude scores of the students was established comparing the mean scores of the students and their sexual behaviors (table 2). Having an active sexual life was found to be independent ($p > 0.05$) of SRH knowledge or attitudes. The utilization of the health care services and the use of contraception were dependent on the students' SRH knowledge and attitude scores. Having always used a condom when having sex in the last twelve months had no relationship ($p > 0.05$) with knowledge, but it was associated with higher attitude scores. The three sexual risk behaviors self-reported by the students were also highly dependent ($p < 0.001$) on their SRH knowledge and attitudes, with students with lower knowledge and attitude scores reporting more risky behaviors. Having done the HIV test was dependent on the knowledge ($p = 0.031$) but not the attitude ($p = 0.510$).

TABLE 2

The relationship between the knowledge and attitude scores was established by Pearson's correlations for the entire sample and separately for women and men (data not presented). The correlation between the global SRH knowledge and attitude scores for all students was 0.369 ($p < 0.001$), indicating that the theoretically expected association between attitude and knowledge exists. The relationship between the contraception and STI knowledge and attitude dimensions was interesting. When the correlations are established separately for women and for men,

for all possible associations, the value of the correlation coefficient is always higher among males (contraception knowledge, and SRH attitude, $r=0.306$ $p<0.001$; IST's knowledge and SRH attitude, $r=0.395$ ($P<0.001$) than among females (contraception knowledge and SRH attitude, $r=0.222$, $p<0.001$; IST's knowledge and SRH attitude, $r=0.213$ ($P<0.001$) indicating that men and women use knowledge differently in the development of their attitudes.

Discussion

College students have moderate knowledge levels and positive attitudes towards SRH, as consistently reported in the literature^(15,23). The higher knowledge and more favorable attitudes of women have been systematically found in surveys about psycho-cognitive aspects of sexuality among young adults^(15,23,24). This trend might be justified mainly by

higher investment of healthcare services has in the needs of women because, due to multiple biological and social determinants, they are more exposed and vulnerable to sexual and reproductive risks⁽²⁵⁾. Better knowledge among women might also be attributed to the sources of information they prefer, which are more formal (health professionals and teachers) than the sources used by men (friends and the internet).

In the present study, older students had lower levels of knowledge and less favorable attitudes than younger students. This result might be attributed to the more hedonic behaviors of older students or to education^(26,27). Younger students attended high school more recently, at a time when sex education was a mandatory course. This curriculum was introduced in Portugal after 2009, resulting in younger students having a different background of sexual knowledge in relation to older college students. The importance of formal sexual education in high school has been studied in literature reviews^(16,26), which demonstrated that formal sexual education could effectively modify sexual risk behavior in college students⁽²⁷⁾.

The life and health sciences area of study had a clear influence on the students' SRH knowledge and attitude scores. This finding was expected because sexuality issues are a part of the syllabus of several bachelor degree programs (nursing, veterinary, and biology, among others).

It is accepted by several theoretical frameworks that knowledge is the foundation of individuals' attitudes and behaviors⁽¹⁶⁾. Thus, modifying knowledge is expected to affect attitudes and, subsequently, behaviors^(16,17). Considering this theoretical

framework, the results of the present work are concerning because the students had only moderate levels of knowledge. As an example of the gaps in knowledge that should be addressed with the students, there are a considerable number of students that do not know the difference between being HIV positive and having AIDS or do not understand that STIs are more likely to be transmitted through unprotected anal sex than vaginal sex. In the present work, there is an apparent inconsistency between knowledge and attitudes: students with moderate levels of knowledge have very positive attitudes. This apparent discrepancy might be due to the more formal format of the knowledge inventory, which captured very detailed knowledge levels among the surveyed students. On the other hand, the favorable attitudes might have been formed by the foundation of knowledge, because attitude is formed over a lifetime through an individual's socialization process. Attitude formation is a result of learning, modeling others, and our experiences with people and situations^(17, 18). In that sense, one of the basic behaviors that should be clearly recommended among young adults, consistent condom use, was not associated with knowledge, but it was associated with attitudes, suggesting that students form adequate attitudes independent of their knowledge.

The results suggest that knowledge is more important among males, who may have a more cognitive approach to attitude formation, while females' attitude formation is more determined by emotive aspects, with previous emotional experiences playing an important role.

Limitations

The survey results may not be generalizable because the participants are from one university. However, the students came from various regions of the country, and we randomly selected classrooms to minimize this limitation. The behavioral intention measures were self-reported and may not accurately measure actual behaviors. Social desirability may have been an issue because of the sensitive nature of the survey items.

Conclusions

In the Portuguese academic context, students have good attitudes towards sexual and reproductive issues, albeit their knowledge was only moderate. Both knowledge and attitudes were associated with the sexual behaviors of contraception use and the

use of SRH surveillance services. Students reporting frequent engagement in risky sexual behaviors had lower knowledge and attitude scores. The association between knowledge and attitudes was positive. That relationship was stronger in men than in women, indicating that knowledge is more important for attitude formation in men than in women. This finding is of greatest importance, as men are also more exposed to risks and require particular attention in the development of nursing interventions to improve the sexual health of college students.

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What we know about the theme

- Theoretically, there is an association between knowledge, attitudes and behavioral skills concerning SRH.
- College students have low knowledge and positive attitudes concerning SRH, especially with respect to contraceptive methods and STIs/VIH. However this population remains sexual and reproductive risk behaviors.

What we learn from the study

- Knowledge and attitudes were positively associated with sexual and reproductive behaviors, including the use of contraception and health care services, and negatively associated risky sexual behaviors.
- The association between SRH knowledge and attitudes was positive, although this relationship was different in men and women. Attitudes are more strongly dependent on knowledge among men than among women.

Table 1. The influence of demographics and academic factors on sexual and reproductive health knowledge and attitudes. The results are presented as the mean (standard deviation)

Variables	SRH Knowledge					SRH Attitude					
	General (0 – 8) [¶]	Contraception (0 – 16) [¶]	STI's ¹ (0 – 16) [¶]	Surveillance (0 – 4) [¶]	Total (0 – 44) [¶]	Re. ² sexuality (5 – 35) [¶]	Preventive (4 – 28) [¶]	STI's (3 – 21) [¶]	Condom (5 – 35) [¶]	Hedonism (3 – 21) [¶]	Total (20 – 140) [¶]
All students	3.86±1.67	8.42±2.44	6.05±2.73	1.43±0.95	22.76±5.79	31.17±4.31	22.97±4.09	15.94±3.50	30.11±5.34	17.62±3.17	118.29±13.92
Gender											
Male (n=690)	3.21±1.65	7.37±2.62	8.50±2.95	1.03±0.90	20.11±6.07	29.09±5.13	21.66±4.22	15.25±3.52	28.00±6.18	17.54±3.07	111.85±15.87
Female (n=1246)	4.22±1.56	9.01±2.12	9.36±2.55	1.65±0.91	24.24±5.05	32.34±3.24	23.70±3.82	16.33±3.44	31.29±4.38	17.66±3.14	121.89±11.19
	p < 0.001	p < 0.001	p < 0.001	p < 0.001	p < 0.001	p < 0.001	p < 0.001	p < 0.001	p < 0.001	p = 0.417	p < 0.001
Age											
≤ 19 (n=619)	3.94±1.59b ⁴	8.63±2.39b	9.10±2.72	1.50±0.94	23.17±5.60b	31.36±4.36b	23.03±4.13	15.98±3.34	30.74±5.19b	17.31±3.15a	118.99±13.95b
20-24 (n=1187)	3.86±1.69b	8.40±2.43b	9.05±2.70	1.41±0.95	22.72±5.83b	31.21±4.21b	22.99±4.02	15.97±3.54	29.94±5.31b	17.74±3.11ab	118.27±13.67b
≥ 25 (n=139)	3.53±1.70a	7.69±2.59a	8.85±3.05	1.32±0.95	21.39±6.08a	30.12±4.80a	22.49±4.42	15.56±3.85	28.81±5.75a	17.90±2.91b	115.41±15.43a
	p = 0.038	p < 0.001	p = 0.624	p = 0.061	p = 0.005	p = 0.008	p = 0.353	p = 0.412	p < 0.001	p = 0.011	p = 0.023
Area of studies											
Life & H ³ (n=1233)	4.10±1.63	8.80±2.30	9.60±2.52	1.52±0.96	24.02±5.33	31.45±3.93	23.38±3.93	16.26±3.49	30.69±4.92	16.86±2.94	120.19±12.44
Other (n=713)	3.44±1.65	7.75±2.53	8.10±2.82	1.27±0.92	20.57±5.89	30.69±4.86	22.25±4.25	15.40±3.46	29.10±5.86	17.18±3.35	114.97±15.63
	p < 0.001	p < 0.001	p < 0.001	p < 0.001	p < 0.001	p < 0.001	p < 0.001	p < 0.001	p < 0.001	p < 0.001	p < 0.001

SRH - Sexual and Reproductive Health; [¶] - Minimum and maximum scores of the scale; ¹ **STI's** - Sexually Transmitted Infections; ² **Re** – Responsible; ³ **H** - Health; ⁴ **abc** - Means in the same column for variable age followed by different letters are different (p<0.05).

Table 2. The relationship between sexual and reproductive health behaviors and knowledge and attitudes. The results are presented as the mean (standard deviation)

	SRH Knowledge		SRH Attitude	
	Mean±SD	p	Mean±SD	p
Active sexual life				
Yes (n=1496)	22.77±5.78	0.930	118.20±14.18	0.665
No (n=449)	22.74±5.86		118.53±13.04	
Contraception use				
Yes (n=1447)	22.86±5.76	0.003	118.43±14.06	0.010
No (n=56)	20.44±6.02		113.48±15.26	
Consistent condom use				
Yes (n=591)	22.69±5.81	0.625	119.68±14.51	0.001
No (n=906)	22.84±5.76		117.29±13.85	
Sex with alcohol				
No (n=1011)	23.06±5.77	0.001	120.18±13.25	<0.001
Yes (n=511)	22.00±5.82		114.14±15.01	
Sex with drugs				
Yes (n=147)	20.41±5.98	<0.001	110.99±15.27	<0.001
No (n=1361)	22.96±5.74		118.97±13.80	
Sex with casual partners				
Yes (n=482)	21.81±5.68	<0.001	113.77±15.21	<0.001
No (n=1023)	23.14±5.78		120.27±13.13	
SRH health care use				
Yes (n=432)	24.78±4.95	<0.001	122.18±12.24	<0.001
No (n=1449)	22.18±5.88		117.17±14.17	
VIH test				
Yes (n=283)	23.37±5.89	<0.031	117.85±14.83	<0.501
No (n=1663)	22.66±5.76		118.35±13.76	

SRH – Sexual and Reproductive Health; SD- standard deviation.