

Development and Validation of Questionnaire Measuring Attitudes towards Sexual Health among University Students

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Aim	To develop a questionnaire on attitudes towards sexual health and validate it on a sample of medical and non-medical students and adult women.
Methods	For the purpose of constructing a Likert-type scale, four medical students generated 130 statements reflecting clearly positive or negative attitudes towards sexual health. The scale had five scoring points (1 – strongly disagree, 2 – disagree, 3 – undecided, 4 – agree, and 5 – strongly agree). We revised the items to ensure that all were clearly positive or clearly negative in their form, as well as straightforward in their meaning, leaving 100 items in the raw questionnaire, which was then applied to the convenience sample (total n = 336) of female medical students (n = 93), male medical students (n = 75), female non-medical students (n = 93) and adult working women with at least high-school education (n = 75). After the administration of the questionnaire, we performed content examination, discriminant validation of the statements, and principal-components analysis.
Results	After discriminant validation of the statements and principal-components analysis limited to three factors, the final scale contained 50 items (20 positive and 30 negative), distributed in three subscales: "Personal sexual health care," "Principles of sexual behavior," and "Safe sex behavior." The Cronbach α of the whole scale was 0.910, indicating good internal consistency. When the scores of the final scale were analyzed for the study sample, all participants had positive attitude towards sexual health, with a mean score (\pm standard deviation) of 4.1 ± 0.4 out of maximum 5. The same was true for all three subscales. Female groups, regardless of their student status or age, did not differ in their attitude scores on the whole scale, as well as on any of the subscales. Male medical students had lower scores on the whole scale and all subscales than the female groups.
Conclusions	It is possible to construct a reliable instrument to assess attitudes towards three important aspects of sexual health: personal sexual health care, sexual behavior, and safe sex behavior. Future studies with this instrument, on different populations and in different cultural and socio-economic settings, are needed to make generalized conclusions on sexual health attitudes and behavior.

Sexually transmitted diseases are related to risks sexual behavior (1,2) and present an increasing problem, especially in the young population (3,4). The sociological "health belief model" by Becker and Maiman predicts that an individual does not take any health-protective actions unless he or she has minimal level of relevant health motivation (5). This means that a person will act only

if he or she feels a potential threat (such as the chances to be infected), and realizes the benefit of employing some sort of protection.

Using the principles of this model, we developed an instrument to measure students' attitudes towards sexual health. We then tested the instrument on a sample of female medical students and their male colleagues, non-medical female

students of the Zagreb University, and adult working women with at least high-school education. We expected that the attitudes of medical students would be more positive than of their non-medical colleagues, because of their specific medical training/knowledge and presumably greater interest in health. On the same argument, we developed the hypothesis that there should be no differences between male and female medical students' attitudes towards sexual health.

Methods

Questionnaire Construction

Our intention was to develop a Likert-type scale that could be used for the assessment of attitudes towards sexual health. We chose this type of scale because its construction is relatively simple, and the interpretation of results straightforward (6). For this purpose, four medical students, coauthors of the study, generated 130 statements reflecting clearly positive or negative attitudes towards sexual health. The scale had five scoring points (1 – strongly disagree, 2 – disagree, 3 – undecided, 4 – agree, and 5 – strongly agree), chosen because students in Croatia are used to such grading system from the beginning of their education (7, 8). The authors revised the items to ensure that all were clearly positive or clearly negative in their form, as well as straightforward in their meaning. After revision, one hundred items on which all coauthors agreed were included in the raw questionnaire, which was then applied to the sample of university students and adult women.

After the administration of the questionnaire, we performed content examination, which disclosed that the questionnaire items could be grouped into three subscales, addressing different aspects of the attitude towards sexual health. The first, "Personal sexual health care", reflected respondents' attitudes towards taking care of and giving attention to their sexual health. The second subscale, "Principles of sexual behavior", reflected respondents' attitudes towards conduct in sexual relationships. The third subscale, "Safe sex", examined respondents' attitudes towards the use of contraception methods that protected sexual health as well (e.g. condom use), as well as towards the possibility of contracting or seriousness of the consequences of sexually transmitted diseases.

Ten items did not fit into any of the subscales and were excluded from further analy-

sis. We performed discriminant validation of the statements (9), examining inter-item correlations and the correlations between the score on an item and total subscale score (item-total correlation). To ensure the validity of item grouping into subscales, for each item we compared corrected item-total correlation within its own subscale to item-total correlations with other subscales. This procedure identified 5 items with item-total correlation and inter-item correlations close or equal to zero, which implied that the item did not belong to the subscale, and 11 with extremely high correlation with another item, which implied tautology. After content analysis of these items, which confirmed the suspected characteristics, a total of 26 items were excluded from further analysis.

To further assure construct validity of the instrument, we performed principal-components analysis (10) limited to three factors (data not shown). Twenty four items that were either not projected on any of the three factors or had factor loading higher than 0.3 for more than one factor were further excluded from the questionnaire. Two more principal-components analyses performed on randomly formed halves of our sample confirmed our final, 50 item, solution.

For the purpose of this report, an independent English tutor translated the items into English, and another one back into Croatian. No improvement was needed for any of the translated statements.

Questionnaire Validation

The sample on which questionnaire was tested comprised four subgroups: 1) 93 female medical students, with a mean age (\pm standard deviation) of 20.4 ± 1.2 years; 2) 75 male medical students, aged 21.7 ± 1.9 years; 3) 93 female non-medical students, aged 21.2 ± 1.3 years; and 4) 75 adult women, aged 38.2 ± 7.9 years. We applied a convenience sampling procedure, with the general response rate of 84% (336 out of 400 distributed questionnaires). Medical students were from the second and third year of medical studies, and were approached during their regular classes at the Zagreb University School of Medicine (168 valid questionnaires out of 200 distributed, 84% response rate). Non-medical students were approached in the facilities of the Zagreb University Student's center (93 returned out of 100 distributed, 93% response rate). The last subgroup was a

Table 1. Final version of the scale measuring attitudes towards sexual health*Personal sexual health care: 24-item subscale (Cronbach $\alpha=0.86$)

1. Woman doesn't have to visit the gynecologist regularly if she has not had sexual relations for a longer period of time.
2. It is important that a woman can talk with her husband about sexually transmitted diseases.
3. Most sexually transmitted diseases can be cured without any treatment whatsoever.
4. It is important to know whether our partner is promiscuous.
5. Talking about unpleasant subjects such as sexually transmitted diseases can endanger a relationship.
6. Woman doesn't have to visit the gynecologist regularly if she has never had sexual relations.
7. After a diagnosis of sexually transmitted disease both partners should receive treatment.
8. The appearance of vaginal acne and warts is a serious symptom of a disease.
9. Everyday personal hygiene is important.
10. Man and woman are equally responsible for buying condoms.
11. Most sexually transmitted diseases don't interfere with normal sexual life.
12. Most sexually transmitted diseases don't interfere with everyday life.
13. The danger of contracting a sexually transmitted disease is not a consequence of sexual behavior but of bad luck.
14. It is better to wait for an unpleasant symptom to persist than to go to the doctor's immediately.
15. Following gynecologist's advice contributes to the maintaining sexual health.
16. Underwear should be changed every day.
17. If a person finds out that he or she has a sexually transmitted disease, he or she has to talk about it with his or her partner.
18. It is not necessary to change a party-liner every day.
19. It is important to know whether our partner has ever had a promiscuous partner.
20. Infertility due to sexually transmitted disease is not highly probable.
21. There is too much talk on sexually transmitted diseases in the media.
22. It is good to know as much as possible about sexually transmitted diseases.
23. The only one who is to blame for the contraction of a sexually transmitted disease is my partner.
24. It is not important if my partner doesn't wash his or her hands before petting (touching intimate parts).

Principles of sexual behavior: 12-item subscale (Cronbach $\alpha=0.82$)

1. Before engaging into sexual relations we should think about it carefully.
2. Only the two people who trust each other completely should have sexual relations.
3. It is fun to sexually experiment with strangers.
4. You don't have to be very close to your partner for sex to be a pleasant experience.
5. It is better to postpone sexual relations until a person is ready to take responsibility for his or her actions.
6. The best way to have a good time is to get drunk and have sex with somebody.
7. The main reason for going to a party is to meet somebody for casual sex.
8. Faithfulness is very important in a relationship.
9. It is boring to have the same sexual partner for a longer time.
10. Sexual intercourse is an intimate experience.
11. It is important that a woman can talk with her sexual partner about their sexual past.
12. Woman should not engage into sexual relations when she doesn't know enough about her partner's personal hygiene.

Safe sex: 14-item scale (Cronbach $\alpha=0.76$)

1. A condom reduces the quality of sex so much that it is better not to use it at all.
2. It is possible to enjoy in sex when you use a condom.
3. It is not practical to use condoms.
4. Contraceptive pills provide sufficient protection during sexual intercourse.
5. The use of condoms shows the lack of trust in partner.
6. If your partner doesn't want to use a condom it is normal to comply with his or her wish.
7. Thinking about sexually transmitted diseases reduces the pleasure of sex.
8. Persons in a steady relationship, longer than a month, don't have to use condoms anymore.
9. Contraceptives ruin spontaneity of sexual intercourse.
10. Health is more important than short, temporary pleasure.
11. Sex is a private thing and when you buy a condom it is as if you posted it on a notice board.
12. You should not give up your habits, even if your gynecologist thinks that they are bad for your health.
13. It is impossible to contract a sexually transmitted disease from a regular partner.
14. The possibility of getting uterus cancer or becoming infertile is a sufficient reason for women to change their bad sexual habits.

*The scale for each item ranged from 1 - strongly disagree to 5 - strongly agree.

sample of adult women with at least high-school education. It comprised women working in the administration of a major dairy company (59 respondents out of 76 approached), center for pharmaceutical research (10 respondents out of 12 approached) and administration of the Zagreb University School of Medicine (6 of 12 approached). Adult working women were approached at their workplace, and asked to fill out the questionnaire (80% total response rate).

The participation in the survey was voluntary and anonymous. To ensure maximum confidentiality and anonymity of the questionnaire, no social or demographic data except gender and age were included in the questionnaire.

Statistics

The correlation matrix based on Pearson's product-moment correlation was used to analyze inter-item correlations, item-total correla-

Table 2. Attitudes towards sexual health among medical and non-medical students and adult women

Subsamples	Score (mean±standard deviation)			
	whole scale	personal sexual health care (24-item scale)	principles of sexual behavior (12-item scale)	safe sex (14-item scale)
Female medical students (n=93)	4.2±0.4	4.6±0.4	4.2±0.5	4.1±0.5
Male medical students (n=75)	3.9±0.5*	4.0±0.5†	3.7±0.6*	3.8±0.6†
Female non-medical students (n=93)	4.2±0.3	4.3±0.4	4.1±0.5	4.1±0.4
Adult women (n=75)	4.1±0.3	4.2±0.4	4.2±0.4	4.0±0.4

* $P < 0.001$ vs. all other groups (ANOVA and Tukey post-hoc test).

† $P = 0.005$ vs. female medical students and female non-medical students (ANOVA and Tukey post-hoc test).

tions, and correlations between the subscales. ANOVA with Tukey HSD *post-hoc* test was used to compare average attitude scores of four subsamples. The α -level was set at 0.05. Statistical analysis was performed using SPSS v. 11.5 (SPSS Inc, Chicago, IL, USA).

Results

After discriminant validation of the statements and principal-components analysis limited to three factors, the final scale used for the comparison of sample subgroups contained 50 items (20 positive and 30 negative), distributed in three subscales (Table 1). The Cronbach α of the whole scale was 0.910, indicating good internal consistency (11). The correlations among the subscales were: 0.54 for the personal sexual health care and principles of sexual behavior, 0.64 for the personal sexual health care and safe sex, and 0.40 for the principles of sexual behavior and safe sex.

Due to the different number of items per subscale, the scores were transformed into a mean grade (1 to 5) so that the results on different subscales were easily comparable. Generally, all participants had positive attitude towards sexual health, with a mean score (\pm standard deviation) of 4.1 ± 0.4 out of maximum 5. The same was true for subscales, where the score for the whole sample was 4.2 ± 0.4 for the subscale on personal sexual health care, 4.0 ± 0.6 for the subscale on the principles of sexual behavior, and 4.1 ± 0.5 for the safe sex subscale.

Female groups, regardless of their student status or age, did not differ in their attitude scores on the whole scale, as well as on any of the subscales (Table 2). Male medical students had lower scores on the whole scale and all subscales than the female groups. Their attitude towards personal sexual health care and principles of sexual behavior was lower than that of any female group (Table 2), whereas their score on the total scale

and the safe sex subscale was similar to that of adult women, and again significantly lower than the scores of female student, either from the School of Medicine or any other University school.

Discussion

Our study showed that it was possible to construct a questionnaire with good psychometric characteristics on the attitudes towards sexual health. Internal consistency of our instrument was high and it proved to have good construct validity. The validation of the scale confirmed three separate facets of attitude towards sexual health, defined in the three subscales. It is important to emphasize that we aimed not only at the cognitive component of sexual health attitudes but also at the behavioral component (12). Although actual behavior cannot be assessed using a questionnaire approach, statements included in our subscales were aimed in the direction that can be associated with actual behavior. We believe that it is very important to assess sexual attitudes in this way because actual behavior is a potential risk or protective factor for sexual health, and thus the most important aspect of sexual attitudes when they are analyzed in the context of health.

When tested on a sample of medical and non-medical students and adult women, the questionnaire showed that all of them expressed positive attitudes towards the three aspects of sexual health: personal sexual health care, principles of sexual behavior, and safe sex measures. These findings are encouraging because studies from other countries in the Southeast Europe revealed poor attitudes towards sexually transmitted diseases (13) and high inclination towards sexual risk behaviors (14,15).

Although we expected that the specific education of medical students would contribute to a more positive attitude towards sexual health, we found no differences among the three female

groups in the study: medical students, non-medical students, and adult working women. This finding may be explained by a recent report that medical students are not a preselected cohort of health-anxious people, or "worriers" (16).

Similarly, we found no age differences in the attitudes towards the three aspects of sexual health among the female groups. We expected that older women would have more positive attitudes, especially on "principles of sexual behavior" subscale, because of their experience and age. Possible explanations for highly positive attitudes of university female students are their knowledge of healthy sex behavior and awareness of potential risks, as well as their interest in this issue at the age when they start having sexual experiences. Also, it has been shown that older adults are more liberal in their sexual attitudes than is usually expected by younger people (17). Age differences in sexual attitudes are a poorly investigated area (17) and require further investigation into this phenomenon.

Male medical students were the only group in our study who stood out with their significantly lower attitudes towards sexual health than female groups. This was not unexpected because other studies in similar or different socio-economic and cultural environments showed gender differences in sexual attitudes (13,14,19,20). Male medical students had the lowest score on the subscale measuring the attitudes towards the principles of sexual behavior. This subscale reflects inclination towards changing of partners and sexual variety, which is significantly more present among men, regardless of culture, age, or geographical location (21).

Interestingly, male medical students did not differ in their attitudes towards personal sexual health care and safe sex from adult working women. This finding is difficult to explain. Liberality of adult women in their sexual attitudes (17) may have contributed to the similarity of scores with male students. However, further studies are needed to explore all possible factors, such as education level and previous sexual experience.

The primary aim of our study was to construct a reliable questionnaire and test its validity, so that the conclusions must be viewed with these limitations of the mind. The main limitation of the study was sample selection. Male gender was represented only by medical students, so possible contribution of education and age on attitudes

could not be explored. Secondly, our sample was a convenience sample and representative only of the urban, middle class Croatian population. Therefore the results on highly positive attitudes could be misleading and not reflect the situation in the whole society. Another limitation was in the fact that we gathered no specific demographic data from our participants to ensure confidentiality and anonymity, so that it was not possible to investigate potential correlates of sexual health attitudes, such as sexual activity, marital or partnership status, sexual history, or sexual orientation.

Despite these limitations, our study showed that it is possible to construct a reliable instrument to assess attitudes towards three important aspects of sexual health: personal sexual health care, sexual behavior, and safe sex behavior. Future studies with this instrument, on different populations and in different cultural and socio-economic settings, are needed to make generalized conclusions on sexual health attitudes, as well as to explore the factors influencing or associated with them. Validated and psychometrically reliable instrument such as the one described in this study is also relevant for assessing interventions in teaching responsible sex behavior or changing attitude and values towards this important aspect of health care.

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