

Development and Psychometric Evaluation of the Sexual Health Protection Scale (SHPS) for Thai Female Adolescents

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Abstract

The objective of this cross-sectional descriptive study was to develop a scale to measure sexual health protective behavior in Thai female adolescents and to examine its psychometric properties during August-November 2006. The item generation was based on an extensive literature search overview of sexual health protection in female adolescents, the conceptual model of sexual health protection to conceptualize the health protection process and qualitative data generated from in-depth interviews. The content validity of the Sexual Health Protection Scale (SHPS) was determined by three experts. The face validity evaluation by 12 female adolescents showed the SHPS to be appropriate and comprehensive. To test for construct validity and internal consistency, the SHPS was completed by 450 female adolescents in the southern part of Thailand. The results showed that the evaluation of the construct validity through the factor analysis yielded 107 items with eight factors namely, 1) alertness to search for information on sexual health; 2) guarding against having unsafe sexual intercourse; 3) perceiving vulnerability of safe sex practice; 4) perceived threats of AIDS, STDS and unwanted pregnancy; 5) communication with parents and peers about safe sex; 6) abstinence from sexual activity; 7) assertiveness in seeking information and 8) self-protection. Cronbach's alpha coefficient on total scale was 0.93. Furthermore, on the validity by contrast group approach, it was found that most of the sexual health protection scores were significantly different between the high risk group and the low risk groups. In conclusion, these findings suggest that the SHPS should be useful for investigators in measuring sexual health protection in the Thai context.

Key words: scale development, sexual health protection, adolescence

Introduction

Adolescents are at a greater risk of sexual health problems, particularly in term of unprotected sexual

relations leading to premature and/or unwanted pregnancies, induced abortions, reproductive tract infections, sexually transmitted diseases (STDs) and HIV

infection. Lack of knowledge in basic reproductive health information, lack of skills in negotiating sexual relationships, lack of access to contraception and reproductive health services and vulnerability to sexual abuse put adolescents at the highest risk of STDs, HIV and unwanted pregnancies.⁽¹⁻³⁾ Many adolescents also lack strong stable relationships with parents or other adults to whom they can address their reproductive health concerns and pressure.⁽⁴⁾ In Thai society, cultural norms based on gender inequality in sexual relations make females reluctant to say no to their partners and feel intimidated in asking their partners outright to use a condom. Therefore, the powerlessness of Thai female adolescents in sexual negotiations places them at greater risk of sexual health problems than male adolescents.

The treatment of sexual health problems such as AIDS constitutes both individual and social burdens whereas adolescents' sexual health protections constitute a less expensive and easier option than treating sexual health problems as they occur. In this study, the model of protection⁽⁵⁾ was used to construct a sexual health protection concept. There have been few research studies focusing on sexual health protection behavior.⁽⁶⁻⁸⁾ Furthermore, the instruments used in these studies have been developed for specific and limited health protection issues but, none of them have addressed the concept of sexual health protection, which may constitute an inadequate assessment of sexual health protection in female adolescents. Therefore, the Sexual Health Protection Scale (SHPS) needs to be developed under the Thai context as the SHPS will be important for investigate regarding sexual health protection strategies employed in dealing with sexual risk situations. This is especially important given that the SHPS can be utilized in intervention research to measure the various strategies for sexual health protection.

Methodology

A cross-sectional descriptive study was implemented. The design of this study was conducted by mixed method, an instrument design model for collecting data and analyzing qualitative data leading to development and tests of a quantitative instrument. The instrument development design included two phases; Phase I, Development of the Sexual Health Protection Scale and Phase II, Psychometric Evaluation.

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Sampling

The participants in this study were Thai female adolescents living in the urban areas of Nakhon Si Thammarat and Songkhla Provinces in Southern Thailand. There were four groups comprising secondary schools students, vocational school students, students who studied in non-formal education settings and female adolescents who worked in factories. The inclusion criteria for the recruitment of the participants consisted of the following: ages between 15-19 years, ability to use verbal communication and willingness to participate in the study. Four groups of participants were recruited at different steps: 1) twenty participants were purposively selected for individual in-depth interview; 2) twelve participants were purposively selected for face validity; 3) thirty participants were purposively selected for pre-testing and 4) four hundred and fifty participants were selected by simple random sampling for the psychometric testing of the final draft. Prior to the data collection, the study proposal and a consent form were approved by the Ethical Committee of the Faculty of Nursing, Prince of Songkla University.

Instrument Development

Two phases were involved in the Sexual Health Protection Scale (SHPS) development as follows.

Phase I: Development of the Sexual Health Protection Scale

Step 1: Domain Identification

An extensive literature review precluded the domain identification. The investigator extensively reviewed the literature providing empirical and theoretical evidence pertaining to the concept of sexual health protection. Then, in-depth interviews were conducted in order to identify specified domains for the SHPS in Thai culture. Firstly, the in-depth interview guideline was developed from the literature review. Secondly, twenty female adolescents were interviewed. Thirdly, the interview data were analyzed and an item pool was formed for the SHPS in the Thai context.

Step 2: Generating and Judging Measurement Items

The items of the SHPS were developed from domains of sexual health protection wherein items reflecting the scale's purpose were selected. Redundancy of items, characteristics of good and bad items and positively and negatively worded items were determined. After determining the scale form, the scale of the SHPS was designed in a rating four-point rating Likert scale (strongly agree, agree, disagree, and strongly disagree) wherein scores ranged from "1" to "4". To test content validity, the first draft of the SHPS was submitted to a panel of professionals consisting of three experts in area of sexual health. To test face validity, the second draft version was examined by 12 participants recruited by convenience sampling using a general debriefing pretest and cognitive interviewing with probe questions. Finally, the third draft was pre-tested with a convenience sample of 30 Thai female adolescents.

Phase II: Psychometric Evaluation

The psychometric evaluation of the fourth draft was conducted with 450 participants. After receiving permission from the schools and the factories, the investigator went to various classes of schools and factories to recruit participants. The participants were informed of the objectives, requirements, confidentiality and participants' rights to discontinue participation at any time. Anonymity was emphasized and a package of questionnaires was given to the adolescents interested in participating in the study. The questionnaires were composed of the demographic data, the SHPS and the Marlowe-Crown Social Desirability Scale (MCSD)⁽⁹⁾ which was used to evaluate the social desirability of the SHPS among participants. Data were collected with a set of self-administrated questionnaires while teachers or employers were not in the rooms. Two weeks later, the fourth draft of the SHPS was retested in 30 participants. Data were collected during August - November 2006.

Data Analysis

Descriptive statistic was conducted to analyze demographic characteristics. Exploratory factor analysis with varimax rotation was used for data reduction and to determine the underlying factors for SHPS. Reliability of the SHPS was investigated by taking inter-item, item-factor, factor-to-factor correlation and internal consistency estimate for each factor. For assessment of the contrast group approach, construct validity, the independent samples t-test was conducted to determine differences in the high risk group and the low risk groups of sexual health protection. In order to confirm that participants did not answer questions based upon the social desirability response, Pearson correlation was conducted to examine the differences between the sexual health protection scores and the scores of the Marlowe-Crown Social Desirability Scale (MCSD)⁽⁹⁾

Results

Part I: Development of the Sexual Health Protection Scale

Step 1: Domain identification

Based on the model of protection,⁽⁵⁾ the concept of sexual health protection was developed. The model of protection comprised seven attributes including appraisal of threat, controlling, regulation, guarding against, seeking information, persuading and alter perception. The investigator extensively reviewed by focusing on all attributes relevant to the model of protection and searching for evidences to support these attributes. Next, five attributes (appraisal of threat, controlling, regulation, guarding against, and seeking information) were selected to develop the model on sexual health protection. Persuading and alter perception were eliminated because they did not fit in the model. The concepts appraisal of threat, controlling and regulating were influential toward sexual health protection behavior. Under different terminology, these three were practically the same as defined in other theories. Appraisal of threat was similar to perceived threat in the Health Belief Model,⁽¹⁰⁾ control was similar to perceived behavioral control in the theory of Planned Behavior⁽¹¹⁾ and regulation was similar to self-regulation in the Social Cognitive Theory.⁽¹²⁾ The extensive literatures review revealed that the terms of appraisal of threat, perceived behavioral control, and self-regulation were commonly used to study issues of sexual health protection included in the present research. In addition there were ample evidences supporting two attributes, namely, guarding against, and seeking information, which were consequently selected in the conceptual development of sexual health protection. Next, the content analysis was used to identify specified domains for the SHPS in Thai culture from in-depth interview data. The results from the in-depth interviews showed that there were six domain of sexual

health protection in which five domains were congruent with the existing domain. An additional domain, for example, attitude toward sexual health protection, emerged as brought up by interviewers.

Step 2 Generating and Judging Measurement Items

The investigators generated items following six domains. The first draft contained a total of 170 items for six dimensions. For the content validity, the experts suggested possible improvements by rephrasing of some items. Forty-five items were dropped; twenty items were further revised for easier comprehensive to Thai female adolescents, and a few items were rewritten to improve their semantic meaning. Then, each expert was asked to evaluate the accuracy and relevance of each item in the SHPS content including its relevancy, clarity and conciseness. Finally, the scale retained 125 items which the experts approved for item clarity and content validity. The content validity index (CVI) for the relevant items was 0.74.

For the face validity, five items, for example, the attributes of perceived behavioral control as related to hygiene care, were deleted. The participants reflected that physical hygiene, especially genital hygiene, was a habit that women were compelled to practice anyway. As a result, the SHPS retained 120 items. After the third draft was pre-tested, the results showed that the scales in this study achieved good reliability coefficients, with the Cronbach's alpha coefficient of 0.90.

Phase II: Psychometric Evaluation

The sample consisted of 450 female adolescents divided into the following four groups; 1) 33 percent (n = 150) were secondary school students; 2) 22 percent (n = 100) were vocational school students, 3) 22 percent (n = 100) were students studying in non-formal education settings, and 4) 22 percent (n = 100)

were factory workers. The mean age of the participants was 16.81 years (SD 1.29) and the majority (64.22 %) of the participants lived with their parents. The average age of the participants at first sexual intercourse was 16.13 years (SD 1.51) and most of the participants (77.8 %) individually had an intimate boyfriend. One-third (35.55 %) of the female adolescents had had experience with sexual intercourse and most of them had had their first sexual intercourse with a friend (34.44 %).

Item Analysis - Most of item-to-item correlations and subtotal correlations exceeded 0.3.⁽¹²⁻¹⁵⁾ Two statistical techniques were also used to confirm the suitability of applying factor analysis. Bartlett's test of sphericity and the Kaiser-Meyer-Olkin were used to measure sampling adequacy (KMO) wherein it was found that Bartlett's test of sphericity was accepted ($\chi^2 = 27863.42$, $p < 0.01$) and the KMO value was 0.86, thus indicating that this data set was a "very good" set on which to use factor analysis. Therefore, the data set of the SHPS was suitable for use in factor analysis

Construct Validity Construct - validity was tested and the sample size ($n = 450$) was large enough for a factor analysis.⁽¹⁶⁾ Exploratory Factor Analysis (EFA) was performed on the 120 items of the SHPS. For analysis and interpretation of the factor analysis, four criteria were applied including factor loading greater than 1, the Scree plot, a loading cutoff point of at least 0.30 and theoretical congruence in each factor.^(14,16) An examination of the Scree plot indicated that 6, 7, and 8 factors should be examined. A total of 8 factors were then judged to be most meaningful, parsimonious, and theoretically consistent. In this phase, 9 items with factor loading of less than 0.3 were dropped out from the scale. Therefore, the final draft of the SHPS was composed of 8 factors and 111 items which explained a total of 39.72 percent of variance and magnitudes of eigenvalues at greater than 2.

After that, a confirmatory factor analysis (CFA) with maximum likelihood estimation was conducted using LISREAL 8.8 to evaluate the construct validity of the SHPS after each of the eight factor composite scores were created by EFA.⁽¹³⁾ Before conducting CFA, eight factors were assessed for model fit by testing whether each factor had adequate information to use for the estimation of the parameters specified in the model. All factors, except Factor VIII, showed that the relationship between each factor and its items was relatively high as indicated by significant t-values which were greater than 1.96. After four were deleted in Factor VIII, there was a relatively high significance between Factor VIII and its items. The next step was the assessment of the suitability of the overall model to see how well it fitted with data of the Thai sample. At this step, each factor was assessed by examining several fit indices. The results showed that the value of the X^2 / df ratio of each factor of the SHPS ranged from 1.92-3.08 and the RMSEA of each factor ranged from 0.00-0.06. Moreover, the GFI, CFI, NFI, and NNFI's values of greater than 0.90 (GFI = 0.92-0.99, AGFI = 0.90-0.95, CFI = 0.94-0.99, NFI = 0.91-0.99, and NNFI = 0.90-0.99) all fit the indices to meet the criteria assessment for the model fit, thus indicating that each factor was acceptably fit to the data.⁽¹³⁾ As a result, the identified factors emerged as follows: 1) alerting to search information of sexual health; 2) guarding against having sexual intercourse; 3) perceiving vulnerability of safe sex practice; 4) perceiving threat of AIDS, STDs, and unwanted pregnancy; 5) communication with parents and peers about safe sex, 6) abstinence from sexual activity; 7) assertiveness information seeking, and 8) self-protection.

The contrast group approach The contrasted group approach (known-group approach) was conducted by the extensive literature review identification of two groups of individuals who were known to

be both extremely high and extremely low in terms of sexual health problems.⁽¹⁵⁾ The independent samples t-test was conducted to determine differences in the high risk group and the low risk groups of sexual health categories: 1) never had an intimate boyfriend and have had intimate boyfriend; 2) studying in the education system and holding a job; 3) never had sexual experience and previous sexual intercourse and 4) lived with parents and did not live with parents. Most of the SHPS scores were significantly ($p < 0.01$) different between the high risk and the low risk groups. However, the SHPS scores on participants staying with parents were not significantly different from the SHPS scores on participants who did not live with parents.

Social Desirability Evaluation - Pearson correlation was conducted to examine the differences between the sexual health protection scores and the scores of the Marlow-Crown Social Desirability Scale (MCSD). The results indicated that there was no relationship between the SHPS score and the MCSD scale, which means that the SHPS does not have participants' social desirability bias.

Reliability was estimated using Cronbach's alpha coefficient for the total scale of the SHPS and its subscale alpha coefficients ranged from 0.81 to 0.94. However, the internal consistency reliability for the eight subscale of self-protection was low at 0.54. Test-retest reliability was conducted at two week intervals and assessed by asking twenty participants to complete the SHPS twice. The percentage agreement of the repetitive questionnaire was calculated and classified by each of factor of the SHPS wherein the percentage agreement of the total score was 83 percent. For individual factors the percentages of agreement ranged from 76.67 percent to 85.6 percent so the test-retest reliability of the SHPS was acceptable.

Discussion

The findings from the psychometric testing dem-

onstrated acceptable internal consistency reliability for the subscales and the total scale. However, the Cronbach's alpha coefficient for the subscale reflecting self-protection did not reach the minimum criteria recommended by Nunnally and Bernstein⁽¹⁶⁾ The low alpha coefficients may have been the result of the small of number of items on the self-protection subscale. Moreover, low alpha coefficients may have been due to the fact that the items lacked homogeneity and perhaps measured more than this one dimension. Therefore, the addition of items to this subscale has been recommended.⁽¹⁴⁾

Factor analysis indicated that Factor 1 contained 15 items reflecting that female adolescents were interested in searching for knowledge on sexual health information. The resources for sexual health information comprised TV, radio, the internet and books or health magazines. Research studies supported that seeking sexual health information is extremely important in shaping the knowledge and attitudes of adolescents.⁽¹⁷⁾ The sexual health topic of that female adolescents found interesting were safe sex practice including contraceptive use, gender roles and STDs, and HIV infection.⁽¹⁸⁾ Factor 2 contained 25 items reflecting that participants used many strategies to avoid having unsafe sexual intercourse including steering clear of situational risks, avoiding drug and alcohol use, and communicating with parents and peers about sexual health protection. A research study supported the postulate that avoiding drugs and alcohol before or during sexual intercourse can protect a female adolescent from STDs, HIV/AIDS and unwanted pregnancy.⁽¹⁹⁾ Moreover, avoiding dates with boyfriends in situational risks, such as, staying with boyfriends in secluded places, going out alone with boyfriends, and having parties without adult supervision, which provides adolescents for intimacy, are all methods for female adolescent's sexual health protection.⁽⁶⁾

Factor 3 contained 17 items reflecting all of the

items showing that female adolescents perceived vulnerability in safe sex practice. Participants showed they could not negotiate with their partners to use condoms and that they felt shy to ask their intimate boyfriends about sexual history or sexual behavior. Moreover, although they had a positive attitude toward sexual intercourse, they had passive behavior with their intimate boyfriends. Recent studies have proposed that perceived vulnerability means that people are perceived as powerless or unable to exert personal control in various situations. The literatures, therefore supported the postulate that females are powerless for safe sex practice.⁽²⁰⁾ Factor 4 contained 15 items reflecting all items presenting features characteristic of perceived threats of AIDS, STDs, and unwanted pregnancies. One previous study supported that perceived susceptibility and severity to HIV/AIDS was associated with increased condom use, fewer intimate partners and decreased numbers of sexual encounters.⁽¹⁾

Factor 5 contained 15 items reflecting that female adolescents communicated with parents and peers, for example, consulted parents about having intimate boyfriends, condom use and pregnancy and safe sex methods.⁽²⁰⁾ Factor 6 contained 9 items reflecting that all items presented abstinence from sexual activity. The items in this factor included refusal to have sexual intercourse at school age and refusal to have unsafe sex. According to the literature review, sexual intercourse is an important behavioral strategy for preventing STDs and HIV infection, and unwanted pregnancies among adolescents.⁽⁸⁾ Factor 7, contained 8 items reflecting that female adolescents were active in seeking information on sexual behavior and sexual history of their intimate boyfriends. A recent research study⁽¹⁸⁾ supported that high percentages of female adolescents agreed that they would ask a partner about condom use before having sexual intercourse and that it was the responsibility of both partners to be sure a

condom was available. Factor 8 contained 3 items reflecting the practice of self-protection by using safe sex practices such as contraceptive drugs, condoms use and long-term familiarity with partners before engaging in sexual intercourse. Self-protection methods in sexual intercourse, for example, STDs, HIV, and unwanted pregnancies were important to the adolescents. However, gender power imbalance affected women's capacity to negotiate self-protection against HIV/AIDS in Botswana and South Africa. Gender power imbalance in sexual interactions, therefore, is increasingly becoming recognized as a factor in fueling the spread of HIV/AIDS by increasing the number of unsafe sexual encounters.⁽²⁰⁾

Limitations

The generalization for the implications of this study is limited because the item contents emerged from female adolescents in only two provinces of the south of Thailand. Moreover, the SHPS contains numerous items, so it would be useful and easy to apply in terms of reliability if its scale could be developed into less prolific than the one used in this study.

Implications

The SHPS would be able to assess sexual health protection behavior or a sense of protection for female adolescents. The scale can be used for nurse practitioners and other providers of primary health care to assess sexual health protection in Thai female adolescents who can be classified into different groups of risk for health problems. However, the scale should provide usage guidelines of using because sexual health is a sensitive issue for female adolescents. If nursing practitioners and primary care unit staffs become aware that different adolescent groups have different levels of sexual protection, nurses will be able to develop health protection or health prevention programs that are appropriate for each adolescent group.

Recommendations

1. The SHPS can be developed into a short form to make it more useful and easier to apply in terms of reliability.
2. Gender differences in sexual health protection behavior should be further explored.
3. A prospective or longitudinal study is needed to identify how various scores on the SHPS subscale may predict the outcome of condom usage or sexual abstinence on the part of female adolescents.
4. The results showed that one third of the total participants were sexually active; therefore sexual health protection intervention must be conducted in both high and low risk groups.

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บทคัดย่อ

พัฒนาและทดสอบคุณภาพแบบวัดการปกป้องสุขภาพทางเพศสำหรับวัยรุ่นสตรีไทย

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วารสารวิชาการสาธารณสุข 2552; 18:1-9.

การศึกษาในครั้งนี้มีวัตถุประสงค์เพื่อพัฒนาและทดสอบคุณสมบัติของเครื่องมือการปกป้องสุขภาพทางเพศของวัยรุ่นสตรีไทย ข้อคำถามถูกพัฒนามาจากการทบทวนวรรณกรรมอย่างลึกซึ้ง จากกรอบแนวคิดการปกป้องสุขภาพทางเพศที่ได้จากการคิดและวิเคราะห์กระบวนการปกป้องสุขภาพและข้อมูลเชิงคุณภาพที่ได้จากสัมภาษณ์ระดับลึก เครื่องมือถูกตรวจสอบความตรงเชิงเนื้อหาจากผู้เชี่ยวชาญ 3 คน ดัชนีความตรงเชิงเนื้อหาของเครื่องมือยอมรับได้ วัดความตรงเฉพาะหน้าจากรู้นสตรีจำนวน 12 คน พบเครื่องมือมีความเหมาะสมและชัดเจน เครื่องมือได้รับการทดสอบความตรงเชิงโครงสร้างและความเชื่อมั่น เก็บข้อมูลในวัยรุ่นสตรีไทย ที่อาศัยอยู่ในภาคใต้ จำนวน 450 คน การประเมินความตรงเชิงโครงสร้างโดยการวิเคราะห์องค์ประกอบพบมีข้อคำถาม 107 ข้อ และมี 8 องค์ประกอบได้แก่ 1) การตื่นตัวในการค้นหาข้อมูลสุขภาพทางเพศ 2) การปกป้องเพื่อต่อต้านการมีเพศสัมพันธ์ที่ไม่ปลอดภัย 3) การรับรู้ความอ่อนแอในการปฏิบัติการณ์มีเพศสัมพันธ์ที่ปลอดภัย 4) การรับรู้สิ่งที่คุกคามจากโรคเอดส์ โรคติดเชื้อทางเพศสัมพันธ์และการตั้งครรภ์ที่ไม่พึงปรารถนา 5) การสื่อสารกับพ่อแม่และกลุ่มเพื่อนเกี่ยวกับเพศสัมพันธ์ที่ปลอดภัย 6) การไม่มีกิจกรรมเกี่ยวกับเรื่องเพศสัมพันธ์ 7) การแสดงออกอย่างเปิดเผยในการค้นหาข้อมูล และ (8) การปกป้องตนเอง ค่าความเชื่อมั่นชนิดสอดคล้องภายในของเครื่องมือทั้งฉบับ 0.93 ความตรงเชิงโครงสร้างในกลุ่มที่เป็นจริงพบคะแนนการปกป้องสุขภาพทางเพศระหว่างกลุ่มเสี่ยงสูงและกลุ่มเสี่ยงต่ำส่วนใหญ่แตกต่างกันอย่างมีนัยสำคัญทางสถิติ สรุปได้ว่าเครื่องมือนี้เป็นประโยชน์ต่อการประเมินพฤติกรรมกรรมการปกป้องสุขภาพทางเพศของวัยรุ่นสตรีไทย

คำสำคัญ:

การพัฒนาเครื่องมือ, การปกป้องสุขภาพทางเพศ, วัยรุ่น