

Designing and Validating a New Youth and Adolescent Sexual Knowledge Scale

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ABSTRACT

INTRODUCTION: There is an increasing trend of premarital sexual experience and teenage pregnancies in Malaysia, coupled with a paucity of data regarding sexual practices amongst adolescents. Current available sexual knowledge scales that were reviewed were found unsuitable to be applied to the Malaysian population, due to a multitude of factors such as cultural and religious sensitivity; explicit nature and contents; targeting specific populations; non-comprehensiveness; **MATERIALS AND METHODS:** The development of a new scale, Youth and Adolescent Sexual Knowledge Scale (YASKS) is divided into qualitative and quantitative stages. The qualitative stage involved extensive literature review of currently available and related scales and expert interviews (qualitative content validity) to identify the domains for sexual knowledge; item identification for each domain and language review. In the quantitative stage, the pretest of the pre-final version, and validation study were conducted among students from International Islamic University Malaysia, in Kuantan. **RESULTS:** Initial Exploratory Factor Analysis (EFA) revealed 11 factors with overall Cronbach alpha of 0.3, 95% CI (0.251,0.422) EFA was then repeated with two factors resulting in deletion of 19 items. Cronbach alpha significantly improved to 0.695% CI (0.548, 0.643), while the alpha for the two domains were 0.68, CI (0.637, 0.724) and 0.5, 95% CI (0.455,0.589). **CONCLUSION:** This study revealed a two-factor model with 12 items of the YASKS with acceptable psychometric properties. This scale is valid and reliable to measure sexual knowledge among youth and adolescents in Kuantan.

Keywords

Sexual knowledge, Youth and Adolescent, New Scale,

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INTRODUCTION

Sexual curiosity frequently occurs among adolescents and youths.¹ Lack of sexual knowledge leads to multiple negative outcomes, such as sexually transmitted infections, including HIV/AIDS; unplanned pregnancies which may then lead to school drop-outs; high risk of pregnancy complications; illegal abortions; child abandonment; and a high mortality rate of children born to such teenage mothers.²

Youths exposed to sexual materials online may practice high-risk behaviour such as inappropriate sexting, pornography, as well as online sexual abuse.³

There is an increasing trend of premarital sexual experience and unintended pregnancies in Malaysia which requires immediate attention.⁴ According to the Malaysian National Obstetric Registry (NOR), teenage pregnancies

accounted for 5% of the total deliveries since 2010, of which 16% of the pregnant teenagers were unmarried.⁵ However, the actual prevalence of premarital teenage pregnancy may be even higher as a result of an increasing prevalence of adolescent premarital sexual activity, which are mostly unprotected.⁶ In an analysis on sex education in schools in Malaysia, 90% of the respondents reported that sex education has not been taught in Malaysian schools.⁷

Sexual knowledge includes knowledge about reproduction, pregnancy, masturbation, abortion, fertility, contraceptive methods, as well as sexually transmitted illnesses.⁸ Talib and colleagues in their review on sexual education in Malaysia stated that sexual knowledge should include the physical development from a childhood to adolescence, the reproduction system, the act of sexual intercourse and subsequent childbirth, control of

pregnancy, the aspect of dealing or judging of sexual advances from men or women and finally the high prevalence of sexually transmitted diseases (STD) and illicit sex.⁷ Based on a paper by Azizah and colleagues, 58.2% of teachers stated that information available in the current text books is insufficient to fully cover important aspects of sexual knowledge.⁹

In a review of teenage pregnancy research in Malaysia, a total of 19,000 births were recorded from 2009 to 2011, of which 1.99% from these births were from unwanted pregnancies.¹¹ The vast influence of mass media, socioeconomic development and modernisation, changed sexual attitudes and norms have been significantly evolving among adolescents in developing and majority Muslim countries.^{12,13} Approximately 13% of 468 youths in the Klang Valley in Kuala Lumpur, the capital city were reported to have experienced premarital sexual intercourse, of which 72% of them did not use any contraception at first intercourse.¹⁴ STDs, unwanted pregnancies, and unsafe abortions are the main sexual and reproductive health issues facing adolescents today.¹⁵

The current literature indicates that worldwide there are few almost similar scales available, however deemed not suitable to be applied to research in Malaysia. The abridged 24 Items Miller-Fisk Sexual Knowledge Questionnaire¹⁶, is found to be culturally inappropriate for use in Malaysia due to its explicit nature of the items. The design of the questionnaire is mostly suitable for highly educated women.

Another scale reviewed was the Sexual Knowledge and Attitude Questionnaire (SKAQ) which was developed as a means to gather information about sexual attitudes, knowledge, experience in a variety of sexual behaviour. This 106 item scale covers domains such as heterosexual relations, sexual myths, abortions, autoeroticism and masturbation.¹⁷ The explicit nature of the questions as well as the focus on the practice aspect of sexual behaviour such as coital techniques and positions, masturbation habits as well as homosexual tendencies is deemed unsuitable to be applied among the youths in Malaysia. A similar study involving college students was done by Dutt and colleagues which focused on exploring sexual

knowledge, attitude and practices using a simple Hindi version of the Sexual Knowledge and Attitude Questionnaire (SKAQ-II), This questionnaire is a self-administered questionnaire constructed in Hindi language and assesses both knowledge and attitudes found that youth have poor sexual knowledge, but have a liberal attitude towards sexuality and are more likely to indulge in sexual acts? with others.¹⁸

Sexual knowledge, attitudes and risky behaviour of students in Turkey¹⁹ were deemed unsuitable as the invalidated survey was produced to obtain baseline information about student knowledge of sexually transmitted diseases, as well as to help establish control and education programs in Turkey. Another invalidated sexual health knowledge questionnaire of students in Nova Scotia²⁰ was also deemed inappropriate for use in Malaysia as the study was done on a background to measure sexual health amongst adolescents, of whom more than 60% were already sexually active.

There are other several questionnaires that were found to measure sexual knowledge and attitudes, for instance the sexual knowledge and attitudes scale designed by Besharat and Ranjbar, which showed good validity and reliability. However the questionnaire was designed for married men and women who already have some sexual experience hence a higher level of sexual knowledge.²¹ Kajehei and colleagues also evaluated sexual and reproduction knowledge of pre-marital couples via a researcher made questionnaire. The questionnaire does not cover all aspects of sexual knowledge and focused on the necessity of sexual health education classes among pre-marital couples.²²

In the Malaysian setting, sexual knowledge scale that is deemed culturally appropriate for the population by Siti Nor and colleagues, consisted of six domains including function of sexual reproduction organs, puberty, pregnancy, contraception, sexually transmitted diseases and abortion²³ Whilst the items of this scale was not specified in the paper, the domains covered served as a guide to the aspects of sexual knowledge to be applied to the current scale proposed.

In this research we have produced a questionnaire, The Youth and Adolescent Sexual Knowledge Scale that differs from other sexual knowledge scales reviewed, as the domains explored focused on the knowledge aspect of sex, without exploring attitudes and practice aspects. To achieve this goal a new Malaysian questionnaire that can comprehensively assess sexual knowledge among youth and adolescents is deemed necessary

MATERIALS AND METHODS

QUESTIONNAIRE DEVELOPMENT

A structured self-administered questionnaire, Youth and Adolescent Sexual Knowledge Scale (YASKS) was developed for this study to assess sexual knowledge. The initial stage of constructing the questionnaire involved:

- a. Reading and extensive literature search on related topics.
- b. Literature review of similar scales from other countries.
- c. Expert opinions from their related fields (Psychiatry with special interest in sexual health, information from Family Health Physician with special interest in adolescents and young adults, Clinical Psychologist).

Five domains were identified:

- a. Sexual health knowledge, understanding, and norms
- b. Level of sexual awareness
- c. Biological secondary developments
- d. Negative consequences and high-risk behaviour
Religious, ethical and legal aspects of sexual practice, sexual preference/orientation

Opinions from a group of experts were obtained for comments for item generation or item deletion in order to validate the contents of this new questionnaire. Experts included those specialized in reproductive and sexual health, health education, family health and psychiatry. Content validity was done using qualitative techniques, where the traits of the items, grammar and allocation of the items were reviewed and edited based on expert opinions. The necessity of items were scrutinized in a three-category Likert scale. Items deemed not relevant were removed from the scale. Problematic items were discussed, rephrased and reclassified into appropriate sub

domains. The questionnaire was revised multiple times based on their suggestions and comments.

Pilot testing was done among 41 pre university students from International Islamic University Malaysia (IIUM), to ensure that items were easily understood for the population it was intended. The result of the pilot test was satisfactory, as all 31 items had score of more than 93% in terms of clarity and understanding.

METHODS

The study protocol was approved by the IIUM Research Ethics Committee (IREC). Sampling of participants was done in the Centre of Foundation Studies (CFS) IIUM. This cross-sectional study involved 480 male and female participants, aged 17-19 who fulfilled all inclusion and exclusion criteria. An online survey form was disseminated to all students in CFS IIUM. Students who agreed to take part in the study were required to give online consent before participating. A total of 480 students were recruited through this method of sampling.

Inclusion Criteria

1. Able to read and communicate in Malay.
2. University Student CFS IIUM in Kuantan.

Exclusion Criteria

1. Unable to read and communicate in Malay
2. International students.

Sample size for validation study, given number of items = 31 items with 5 domains, using simple calculation of 10 respondents per item²⁴, factoring a dropout rate of 20%. The final sample size is determined to be at a minimum of 372 university students in CFS IIUM.

RESULTS

SOCIODEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

All data of the 480 students was complete with no missing data obtained. Table 2 shows the socio-demographic characteristics of the respondents. The age of the respondents ranged from 17 to 20 years old, with a mean

age of 19.05 (SD=0.394). In terms of gender, female participants formed the majority at 68.3%. The study population was predominantly Malay (94.2%). Most students came from B40 (52.9%) families at an income of lower than RM5000, 28.5% from M40 and 18.5% from T20 group.

Table 1 Socio-Demographic Characteristics of Respondents (n= 480)

Variables	Mean	SD	Frequency	Percentage
Age	19.05	0.394		
Gender				
Male			152	31.7
Female			328	68.3
Race				
Malay			452	94.2
Chinese			13	2.7
Indian			6	1.3
Others			9	1.9
Family Income				
Less than RM5000			254	52.9
More than RM10000			89	18.5
Between RM5000-RM10000			137	28.5

RELIABILITY

Based on internal consistency, overall Cronbach alpha for this scale with 31 items was 0.3, 95% CI (0.251, 0.422) which is generally categorized as poor reliability.

EXPLORATORY FACTOR ANALYSIS

Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy of this scale was 0.696, which is considered mediocre as the value is more than 0.6.²⁵ Bartlett's Test of Sphericity showed a Chi Square statistic value of 2444.166, with a significant P-value of <0.001 thus supporting the validity of the EFA model.

Table 2 KMO and Bartlett's Test

KMO and Bartlett's Test	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.696
Bartlett's Test of Sphericity	Approx. Chi-Square
	2444.17
	Degree of Freedom
	465
	P Value
	<0.0001

The items were run with EFA to explore the number of factors and was found to have 11 domains with total variances of 37.88%. The 11 domains and their loaded items were found not to fit with the theoretical construct of the Youth and Adolescent Sexual Knowledge Scale.

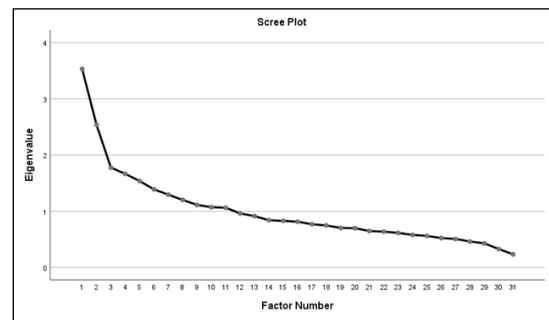


Figure 1 Scree Plot

Therefore, the number of factors was then fixed to two and three based on the Eigenvalues and scree plot. The cumulative column indicated that the total item variance for two and three factors are 19.58 and 25.3 respectively. All items were arranged based on the factor loading and compared between two and three factors that were extracted in this study. No cross loading was observed for both 2 and 3 factor loadings.

Table 3 Factor Loading, Cronbach Alpha Value for 3-Factor EFA and 2-factor EFA Models

Constructs/items	3-factor		2-factor	
	Factor loading		Factor loading	
Domain 1			Domain 1	
Q14	0.66		Q14	0.61
Q15	0.58		Q15	0.51
Q16	0.71		Q16	0.62
Q25	0.38		Q21	0.43
Q27	0.38		Q25	0.52
			Q27	0.41
			Q28	0.38
Cronbach alpha	0.69		Cronbach alpha	0.68
Domain 2			Domain 2	
Q5	0.31		Q12	0.486
Q12	0.49		Q18	0.339
Q18	0.36		Q19	0.471
Q19	0.48		Q26	0.426
Q26	0.44		Q31	0.464
Q31	0.45			
Cronbach alpha	0.56		Cronbach alpha	0.52
Domain 3				
Q21	0.91			
Q22	-0.78			
Cronbach alpha	-5.5		Cronbach alpha	
Overall				
Cronbach alpha	0.50			0.603

Items which had poor factor loadings below 0.4 as well as with negative loadings were deleted. The overall Cronbach alpha for a two-factor scale improved to 0.603, 95% CI (0.548, 0.643), which indicates acceptable reliability compared to 0.50 for the three-factor scale. For the two-factor scale, the Cronbach alpha for domains one and two was 0.68, 95% CI (0.637, 0.724) and 0.52, 95% CI (0.455,0.589) respectively. In the three-factor scale the

third domain had poor Cronbach alpha of -5.5. Based on the The double-barreled nature of the question is considered the main factor for poor scoring. Whilst kissing is considered a low risk sexual act, some data have shown that mild infections such as Herpes Simplex Virus and Cytomegalovirus may spread via oral secretions. findings, the two-factor scale was adopted as the final version.

DISCUSSION

In developing a new instrument for a study, a researcher has to consider the quality of the instrument, which is traditionally understood as having good validity and reliability.²⁶ Reliability is concerned with the ability of an instrument to measure consistently. Internal consistency describes the extent to which all the items in a test measure the same concept or construct and hence it is connected to the inter-relatedness of the items within the test.

Factor analysis was conducted to measure the overall internal consistency forming the scale. The initial results when all items were analyzed yielded poor reliability as indicated by the value of 0.3 of the Cronbach Alpha. With the Eigen value set at one, we managed to retain a total of 11 factors. Some studies have found that the rule of Eigen Value = 1 (EVG1) leads to the retention of more factors than warranted, and may lead to over extraction.²⁷ The decision to adopt EVG1 may result in distorted conclusion and poor recovery of underlying factors.²⁸ Hence, researchers suggest an alternative criterion when faced with too many factors obtain, that is to solely observe the scree plot, which is acceptable but may involve a degree of subjectivity.²⁹ In a study done by Patil et al who reviewed 37 validation studies, it was found that 24% solely used the scree plot method.²⁷ However, it is generally accepted that using the scree plot on its own to determine the number of factors may cause several complications such as the presence of more than one break point or no visible break points.³⁰

Thus, we adopted the scree plot only method and fixed the number of domains to two and three. By adopting 2 factors, as well removing the negatively loaded items and

removing poor scoring items below 0.3, the overall Cronbach alpha increased significantly to 0.6, which indicates acceptable reliability. Due to this, 12 items were retained whilst 19 items were removed. In other studies assessing similar item, it was found that the initial analysis yielded two to six factors, of which the authors proceeded to select four domains.³¹ In another similar study done in Seville, the authors also developed a scale with a 3 factor model consisting a total of 8 items to assess both sexual knowledge and practice in university students.³² This is also similar to 15 item scale with one dimensional construct, developed to measure sexuality and contraception knowledge among nursing students.³³

Cronbach alpha for the sexual knowledge and understanding domain (domain 1) was 0.68 which is deemed as acceptable. For the second domain named negative consequences and high-risk behavior had a Cronbach alpha value of 0.52 which is considered poor. A low Cronbach alpha may indicate that students lack knowledge on the subject, hence predispose to random answering.³⁴ A complete understanding of the concept of internal consistency, homogeneity or uni-dimensionality can help improve the use of alpha.³⁴ A measure is said to be uni-dimensional if its items measure a single latent trait or construct. In creating this scale to measure sexual knowledge, the level of difficulty for each question was varied in order to create a fair assessment of overall knowledge. Hence, it is possible that this might have contributed to the poor internal consistency score.

STRENGTHS AND LIMITATIONS

This study has some notable strengths including having a large sample size for EFA which allows for more precision³⁵, stable factor pattern and more replicable.³⁶ In addition, our questionnaire achieved acceptable results in the validation and reliability test performed.

Possible limitations that may have led to the poor retention of factors are as below:

1. The study result has limited generalization since data collection only involved students from a single University, IIUM, in Kuantan, Malaysia. Apart from

that, the demographic distribution consisted of majority Malays and Muslims, which cannot represent Malaysian young adults due to its multi-ethnicity.

2. Inadequate wording of the items which leads to high measurement error resulting in a small percentage of common variance.³⁷
3. Collecting data via online surveys protects against loss of data, simplifies database analysis and potentially guarantees a better response rate. ^{38; 39} However, researchers have little control over who and how any participant fill out the questionnaire, which may affect overall reliability as it would be difficult to determine whether any attempt is made to answer the questions accurately a opposed to ticking boxes at random. Online data collection is also based on volunteer sampling rather than probability sampling, which may lead to volunteer bias.
4. Information bias may also be present, since the data collected was related to sexual issues which is considered 'taboo' and sensitive to most local population. Respondents might be worried about their confidentiality and possible implications it might have on them in answering the questionnaire.

CONCLUSION

This study has found the YASKS with two-factor model has acceptable psychometric properties. Nevertheless, it would be useful to further examine the reliability of the scale in different populations with more diverse age groups including younger children in primary school or even older adults. Overall, the researchers would recommend the usage of the two-factor Youth and Adolescent Sexual Knowledge Scale for similar age group and among the community sample of adolescents seeing that it has acceptable Cronbach alpha value.

The revised version of this scale containing 12 items is effective in measuring sexual knowledge amongst youth and adolescents with an added advantage of being less time consuming.

Finally, there is an inherent need for authorities from the Ministry of Health and Ministry of Education in Malaysia

to work together to carry out more research on this issue and to plan an appropriate and suitable sexual health module as part of health promotion and prevention strategy for young adults with poor sexual knowledge.

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