

# Reliability and Validity of the Sexual Intention Questionnaire for Adolescent Boys (SIQ-AB) in Malaysian Context

Saini N, Saimon R, Safji R

Faculty of Medicine & Health Sciences, Universiti Malaysia Sarawak, Kota Samarahan, Sarawak, Malaysia.

## ABSTRACT

**INTRODUCTION:** The newly developed Sexual Intention Questionnaire for Adolescent Boys (SIQ-AB) is an adapted tool from the Youth Sexual Intention Questionnaire (YSI-Q) and Theory of Planned Behaviour (TPB), aimed to assess the influence of knowledge, permissive attitude, social norms, and self-efficacy toward the sexual intention. Thus, the aim of this study was to validate the newly developed SIQ-AB to determine Malaysian adolescent boys' sexual intention. **MATERIAL AND METHODS:** The SIQ-AB validity and reliability were assessed in this study. A total sample of 252 (Exploratory Factor Analysis, n=126 and Confirmatory Factor Analysis, n=126) among adolescent boys from Serian and Kota Samarahan, Sarawak were included in this study. The exploratory factor analysis (EFA) assessed three constructs of sexual intention which include attitude, self-efficacy, and social norms with a 4-point Likert scale with a total of 19 items. The confirmatory factor analysis (CFA) assessed the TPB constructs of sexual intention, attitude, self-efficacy, and social norms with a 4-point Likert scale with a total of 19 items adopted from YSI-Q. **RESULTS:** The four-factor structures were supported by the EFA which had 19 items which accounted for 65.79% of the variation overall. Four items were removed due to improper positioning or low factor loading (<0.50), even though EFA supported the four-factor structure. Using Cronbach's alpha, internal reliability varied between 0.77-0.89. Construct, convergent and composite validity of the SIQ-AB were further validated by the CFA with  $\chi^2=199.0$ ,  $df=129$ ,  $p<0.001$ ,  $\chi^2/df=1.54$ , CFI=0.98 and TLI=0.98 and RMSEA=0.06. **CONCLUSIONS:** The result proved that the SIQ-AB instrument is a valid and highly reliable tool to assess adolescent boys' sexual intention.

## Keywords

Sexual intention questionnaire for adolescent boys (SIQ-AB), factor analysis, theory of planned behaviour

## Corresponding Author

Dr. Nazrie Saini  
Faculty of Medicine & Health Sciences,  
Universiti Malaysia Sarawak,  
Jalan Datuk Mohammad Musa,  
94300 Kota Samarahan, Sarawak, Malaysia  
E-mail: nazriesaini@gmail.com

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## INTRODUCTION

Adolescents today are more prone to participate in early sexual activity, increasing the potential of multiple sexual partners through unsafe sexual.<sup>1</sup> The peak age for sexual initiation is between 15-19 years old, which affects about 30-50% percent young men and women from worldwide.<sup>2</sup> In Malaysia, about one-third of adolescents are engaged in sexual activities before the age of 14, which could negatively affect their health and development.<sup>3</sup> As a result, they are at higher risk of contracting sexually transmitted disease, unintended pregnancies, induced abortions, and psychological health consequences.<sup>4</sup> Some of most trending and social problems among adolescent in Malaysia include disciplinary problems, physical bullying, suicidal thoughts, free sex, tobacco consumption, alcohol

abuse, drug abuse and media influence.<sup>5</sup>

The male adolescents sexual debut is at a higher prevalence rate than female adolescents.<sup>2</sup> One of the causes for increasing sexual debut is due to a strong drive to experiment sexual activities and a need for independence.<sup>6</sup> Adolescent boys may also face pressure to conform to societal expectations regarding masculinity and sexuality.<sup>7</sup> A research indicated that their first sexual intercourse happened because they 'had a crush' on the other person.<sup>8</sup> Furthermore, adolescent boys are more active in social networks than adolescent girls, hence exposing them to risky sexual behaviour.<sup>9</sup>

For this reason, there is an urgent need to measure sexual intention among adolescent boys in Malaysia. Sexual intention is the main driving force behind sexual activity after puberty. Currently, the tools used to measure sexual intention in adolescents are limited to ages older than 18 years old and for both genders. Youth sexual intention questionnaire (YSI-Q) was developed for unmarried youths aged 18-22 years old around Klang Valley, Malaysia with Cronbach alpha ranged between 0.89-0.94.<sup>10</sup> YSI-Q is also used to measure sexual intention among late adolescent (both genders) aged 18-19 years old in Kuantan government school.<sup>11</sup> In other Asian countries, an open-ended specific questionnaire was employed to identify the factor perceived to affect the intention of sexual behaviours among junior high school in both gender in Thailand.<sup>12</sup> In Indonesia, a Youth Sexual Intention Scale (YSIS) were used to measure sexual intention among students aged 15-18 in both genders from four high schools in Selayang district, Medan City.<sup>13</sup>

Another reason for the need of this questionnaire is due to Malaysia's diverse and various cultural and religious beliefs surrounding sexuality.<sup>14</sup> As such, sexual intention tool can be tailored to accommodate these perspectives, ensuring that the tool provided is culturally sensitive and relevant to the Malaysian context. Thus, the aim of this study was to validate a newly developed Sexual Intention Questionnaire for Adolescent Boys (SIQ-AB) to determine Malaysian adolescent boys' sexual intention.

## MATERIALS AND METHODS

### Study Design

This study applied three types of validation design namely i) content validity, ii) construct validity, and iii) internal validity, to ensure the validity and reliability of the Sexual Intention Questionnaire for Adolescent Boys (SIQ-AB).

### Study Population

Boys between the ages of 13-17 years old who attended school made up the study sample. Participants who were unable to read or write were not allowed to participate in the study, nor were they allowed to do so without parental or guardian authorization.

### Sample Size and Sampling Method

Sample size for exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were calculated based on sample-to-item ratio. The recommended ratio should not be less than 5:1.<sup>15</sup> Hence, this study with 20 items, required 100 respondents. This study used a purposive sampling.

### Instrument

This study adopted the instrument YSI-Q instrument (20 items) to evaluate sexual intention, which is influenced by a permissive attitude, perception of social norms, and perceived self-efficacy in forecasting sexual intention.<sup>7</sup> The response was given on a 4-Likert scale, with 1 being "Strongly Disagree" and 4 being "Strongly Agree." On top of the 20 items from Muhammad et al., (2017), this study added 14 knowledge items specific for adolescent boy. Three out of 14 items were exclusively for adolescent boys. For example, '*Gonorrhoea among adolescent boy causes pus production from the urinary tract*'. '*Only gay, drug user and sex workers can be infected by HIV*' and '*the use of male condom can reduce the risk of HIV infection*'.

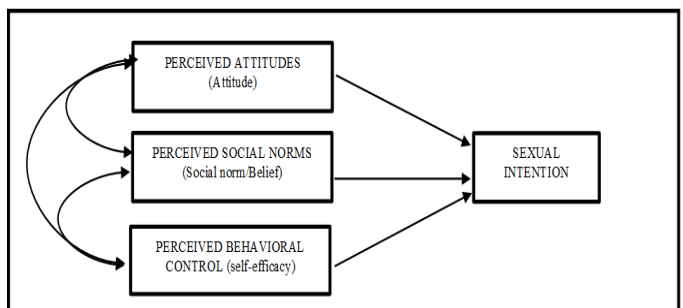


Figure 1: Theoretical framework for sexual activity based on Theory of Planned Behaviour

### Data Collection Procedure

Schools under the Kuching Healthy City project were selected for this study. The researcher then obtained the necessary approvals from the Sarawak State Education Department and the principals of the selected schools. Research information and parental consent form were sent to parents via the students who were selected by respective school counsellors. Students with parental consent who took part in the study, were informed about study objectives and procedures. They were gathered in the school hall and answered the questionnaire with the presence of the researcher. Participants were encouraged to

ask any questions or verify any words they did not understand.

### **Content Validity**

Content validity is the assessment on the validity of content for each item to identify whether the items represented domains of the scale in the instrument.<sup>16</sup> Five panel experts with the background of public health physician, health educationist, and public health nurse, were invited to determine the content validity of the 20 items of Youth Sexual Intention Questionnaire (YSI-Q). Each item was rated by each panel expert as 'essential', 'useful but not essential', and 'not necessary'. Once the items were rated, the content validity ratio (CVR) was calculated using Lawshe's formula.<sup>17</sup> Since the number of panel experts involved were five or less, only items with CVR of  $\leq 0.99$  or items received 'essential' rating from all experts were retained.<sup>17</sup> Any item that achieved less than 0.99 were removed. After performing content validity, the items that were subjected to a forward-backward translation technique starting with English to Malay and then back to English. It was conducted by two independent linguists who were fluent in Malay and English. Replacement of jargons and ambiguous words were done based on the comments from the translator.

### **Construct Validity**

Construct validity was performed by using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) procedures.

### **Exploratory Factor Analysis (EFA)**

To better understand the patterns of interactions between constructs, EFA analysed 19 items representing three domains of Theory of Planned Behaviour (TPB). The number of components in the model can be confirmed and verified using EFA.<sup>18</sup> Sample size and the degree of the link between the measurements were the two fundamental prerequisites for EFA. Even so, the investigator ought to consistently gather the greatest number of samples to represent each variable (for example, 5 samples per item).<sup>19</sup> This is to reduce the likelihood of over fitting the data. Thus, a sample size of

100 or greater in this study is desirable.<sup>7</sup> In this study, 126 adolescent boys were recruited EFA test.

The principal axis factoring methods were used to extrude factors from the correlation matrix, rotate the factors, and interpret the factor analysis results. The method of EFA includes i) generating factors whenever feasible combinations of the variables in a correlation matrix, ii) extruding factors from the correlation matrix, and iii) rotating the factors.<sup>20</sup> The process of rotating the factors or eigenvectors in an effort to attain simple structure is referred to as rotation.<sup>21</sup> In order to create the factor correlation matrix of values more than 0.50 for the purpose of this study, Varimax rotation was used. The Kaiser-Meyer-Olkin (KMO) procedure was used to assess the correlation matrix factorability.<sup>22</sup> Thus, a correlation matrix approach reveals if the correlation between a small group of variables is due to factors or random chance,  $> 0.60$  is a satisfactory value for KMO.<sup>20</sup>

### **Confirmatory Factor Analysis (CFA)**

In order to establish the reliability of the SIQ-AB scale, the CFA was utilized to validate the factor structure suggested by the EFA technique.<sup>22,23</sup> Another set of 126 samples were subjected to the CFA. Goodness-of-fit was used to evaluate the model overall fit. It is believed that well-fitting models provide the data sufficiently and enable confidence to be applied to the entire population. Firstly, the chi-square ( $\chi^2$ ) that is not significant. The chi-square test however might result in an incorrect model fit if the sample size is excessive or if multivariate normality is violated.<sup>24</sup> Therefore, the normed chi-square test which is less than three ( $\chi^2/df$ ) is utilized to augment the chi-square test result.<sup>25</sup>

A good model fit is defined as a goodness-of-fit index (GFI) over 0.90.<sup>24</sup> Popular measures of fit include the Root Mean Square Error of Approximation (RMSEA), which does not need to be compared to the null model. An appropriate model fit is one with an RMSEA index value of less than 0.10 and up to 0.80.<sup>26</sup> Given their usefulness as measures of global model fit with a limited sample size, the CFA utilized the comparative fit index (CFI) and normed for index (NFI).<sup>27</sup> An index value of

more than 0.90 suggested a satisfactory fit.<sup>25</sup> In the modelling of linear mean and covariance structures, the Tucker-Lewis index (TLI) is well-liked in preventative research.<sup>26</sup>

### Convergent Validity and Composite Reliability

The Average Variance Extracted (AVE) was calculated to evaluate the convergent validity of the questionnaire. The AVE value must meet a criterion of at least 0.50 in order for convergent validity to be accepted. If the Composite Reliability (CR) value is at least 0.60, composite reliability has been attained.

### Discriminant Validity

By using the heterotrait-monotrait ratio (HTMT) correlations, discriminant validity is demonstrated between two reflective constructs if the HTMT value is less than 0.90.<sup>28</sup>

### Internal Reliability

The internal reliability of this latent construct was assessed by determining the Cronbach Alpha value for each of its component elements or domains. Internal reliability for all domains and the complete latent construct was considered adequate with Cronbach Alpha values greater than 0.70.<sup>29</sup> Internal reliability tests were conducted twice for both EFA and CFA.

## RESULTS

### Socio-Demography of Participants

A total of 252 respondents ie 126 for EFA and 126 for CFA adolescent boys from Kota Samarahan and Serian areas in Sarawak participated in this study. The sociodemographic characteristics of respondents are shown in Table I.

### Content Validity

In this study, 19 out of 20 items acquired an “essential” evaluation from five panel experts (CVR $\leq$ 0.99). One item under the permissive attitude domain, ‘I believe that having sex for the first time is the best’ scored only 0.4(below 0.99). Thus this item was dropped. The panel experts view this item unsuitable for adolescent boys as it may encourage

Table I: Sociodemographic characteristics of respondents

Pilot testing	Exploratory Factor Analysis (EFA)		Confirmatory Factor Analysis (CFA)	
	Frequency (%) n=126	Mean (SD) n=126	Frequency (%) n=126	Mean (SD) n=126
Socio-demographic characteristics				
Age				
13	126 (100.0)	13.0	25 (19.8)	14.7 (1.3)
14		(0.0)	35 (27.8)	
15			30 (23.8)	
16			19 (15.1)	
17			17 (13.5)	
Race				
Malay	51 (40.5)		41 (32.5)	
Chinese	2 (1.6)		2 (1.6)	
Dayak	68 (54.0)		83 (65.9)	
Others	5 (4.0)			
Form				
Form 1	126 (100.0)		25 (19.8)	
Form 2			35 (27.8)	
Form 3			30 (23.8)	
Form 4			19 (15.1)	
Form 5			17 (13.5)	
School location				
Kota Samarahan	126 (100.0)		76 (60.3)	
Serian			50 (39.5)	
SRH-communication 1: Discuss SRH with parent				
Never	86 (68.3)		104 (82.5)	
Seldom	28 (22.2)		18 (14.3)	
Sometime	5 (4.0)		1 (0.8)	
Often	7 (5.6)		3 (2.4)	
SRH-communication 2: Discuss SRH with siblings				
Never	93 (73.8)		101 (80.2)	
Seldom	24 (19.0)		14 (11.1)	
Sometime	7 (5.6)		6 (4.8)	
Often	2 (1.6)		5 (4.0)	
SRH-communication 3: Discuss with friends				
Never	39 (31.0)		50 (39.7)	
Seldom	55 (43.7)		34 (39.7)	
Sometime	11 (8.7)		10 (7.9)	
Often	21 (16.7)		32 (25.4)	
SRH-communication 4: Did SRH information be made available at schools?				
Yes	69 (54.8)		79 (62.9)	
No	57 (45.2)		47 (37.3)	
SRH-risky behaviour 1: Watching pornography				
Never	4 (3.2)		23 (18.3)	
Occasionally	94 (74.6)		83 (65.9)	
Always	28 (22.2)		20 (15.9)	
SRH-risky behaviour 2: Masturbation				
Never	55 (43.7)		41 (32.5)	
Occasionally	68 (54.0)		69 (54.8)	
Always	3 (2.4)		16 (12.7)	
Sexual intention				
Low	81 (64.3)		100 (79.4)	
High	45 (35.7)		26 (20.6)	
Self-efficacy				
Low	47 (37.5)		64 (50.8)	
High	79 (62.7)		62 (49.2)	
Attitude				
Low	114 (90.5)		102 (81.0)	
High	12 (9.5)		24 (19.0)	
Social Norm				
Low	117 (92.9)		107 (84.9)	
High	9 (7.1)		19 (15.1)	
Knowledge				
Low	21 (16.7)		11 (8.7)	
Moderate	72 (57.1)		67 (53.2)	
High	33 (26.2)		48 (38.1)	

\*SRH- Sexual and reproductive health

overall S-CVI for three domain (self-efficacy, social norm and permissive attitude) were 0.97. For example, words such as “old-fashion” changed to “not-up-to-date’ and ‘sexual intercourse’ changed to ‘having sex’ for better understanding. Since the number of experts were fewer than five, only items with a CVR of at least 0.99 were retained.<sup>17,30,31</sup>

## Construct Validity

### Exploratory Factor Analysis (EFA)

Table II displays the results of the assessment of the 19 items related to sexual intention, self-efficacy, attitude and social norms. The subscales used a 4-point Likert scale. The Bartlett’s test of sphericity  $\chi^2 (171) = 1388.74$ ,  $p < 0.001$ , along with the KMO of 0.855, Suggest that the correlations between the items were significant enough to support factor analysis. This study identified four components to be the most efficient for conceptual and statistical analysis; together, they accounted for 65.7% of the variation.

Table II: Factor loadings for EFA

Item	Factor				Uniqueness
	1	2	3	4	
C2	0.901				0.1555
C3	0.869				0.221
C1	0.823				0.273
C4	0.631				0.336
C5	0.559				0.324
F1		0.891			0.216
F2		0.765			0.342
F4		0.630			0.607
F3		0.606			0.549
E1			0.799		0.376
E4			0.504		0.428
E2			0.473		0.545
E6			0.432		0.526
D2*			0.431	0.402	0.512
E5				0.576	0.391
D1				0.539	0.544
D4				0.501	0.651
E3				0.443	0.641
D3				0.435	0.514

\* Item deleted

The Scree Plot in Figure 2 suggests that this latent construct has four dimensions or components. Which item corresponds to which components or domains was determined by the rotated component matrix. Items with factor loadings of at least 0.4 were kept for further analysis.<sup>29</sup> At this level, one item was removed. Thus, the 18 items were kept .

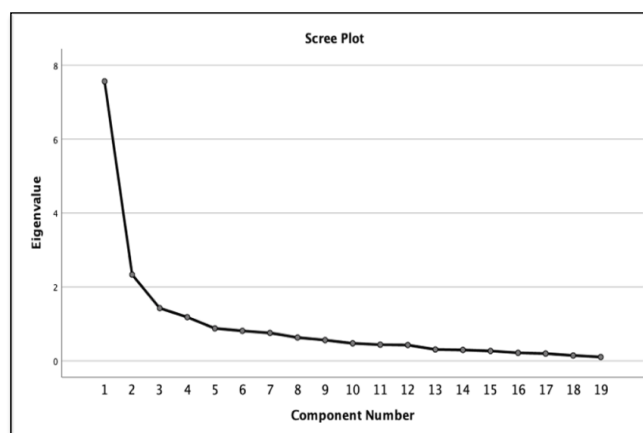


Figure 2: Scree Plot of Eigenvalues and component number

Which item corresponds to which components or domains was determined by the rotated component matrix. Further analysis was conducted on the items that had factor loading of at least 0.4.<sup>29</sup> At this level, one item was removed. The response to the attitude component's question, 'Youths should have sex before getting married to determine if they are compatible,' has been removed. Hence the retained items were 18.

### Confirmatory Factor Analysis (CFA)

CFA included four factors and 18 items to corroborate factor structure. The CFA procedures removed three items because of poor communality and low factor loadings after the factor loading characteristics of each item were analysed. Certain items were interpreted differently causing them to be splitting. The 4-factor/15-item scale that remains after three items are removed offers the minimal level of model fit. Absolute Fit category has met the thresholds of  $>0.05$  and  $<0.08$  respectively, with a p-value of 0.00 and the RMSEA of 0.06. The TLI was 0.98 and the CFI was 0.98, both of which met the  $>0.90$  requirement for the incremental fit category. Meanwhile, the ratio of ChiSq/df for the Parsimonious Fit category was 1.54, which has achieved the threshold of  $<3.00$ . As a result, the questionnaire satisfies the criteria for the construct validity assessment.

<sup>32</sup>

### Convergent Validity and Composite Reliability

In order to evaluate the questionnaire's convergent validity, the Average Variance Extracted (AVE) was calculated. Based on the findings of AVE and CR for

every component or domain, the questionnaire satisfies all requirements for composite validity and convergent validity.<sup>32</sup>

**Table III:** AVE and CVR for each component in the model

Domain	Item	Factor loading	CR	AVE
Sexual intention	C1	0.86	0.93	0.77
	C3	0.89		
	C5	0.91		
	C4	0.85		
Self-efficacy	F1	0.93	0.88	0.64
	F2	0.93		
	F3	0.71		
	F4	0.58		
Attitude	E4	0.83	0.80	0.57
	E2	0.69		
	E6	0.75		
Social Norm	E5	0.83	0.82	0.54
	D1	0.65		
	D4	0.63		
	D3	0.81		

AVE indicates Average Variance Extracted, CR indicates Composite Reliability

### Discriminant Validity

According to the results, the Heterotrait-Monotrait (HTMT) ratios of self-efficacy, social norm and attitude with sexual intention are acceptable at 0.53, 0.83 and 0.70. The ratio of attitude and social norm with self-efficacy also acceptable. Meanwhile, attitude toward social norm is acceptable under the cut-off point of 0.90.

### Internal Reliability

Following dimension reduction, this latent construct internal reliability and each of its components or domains was assessed by determining the Cronbach alpha value which for the 15 items was 0.89.

### The Final Questionnaire and Its Scoring Procedure

Four components were identified from the final set of questions in the Sexual Intention Questionnaire for Adolescent Boys (SIQ-AB), which consisted of 15 items. a rating derived from the answers on a 4-point Likert scale, where 1 represents strongly disagree and 4 represents strongly agree. The domains were; Domain 1: A higher intention to have sex is indicated by a higher total score on items 1-4 (siq1-siq4); Domain 2: A higher total score of items 5-8 indicates a higher perception of self-efficacy in performing sexual activity (siq5-siq8); Domain 3: A higher total score of items 9-11 indicates a higher perception of social norms on premarital sex (siq9-siq11); Domain 4: A

higher score of items 12 to 15 indicates a higher permissive attitude towards premarital sex (siq12-siq15). Table IV tabulates the final items on the Sexual Intention Questionnaire for Adolescent Boys (SIQ-AB)

**Table IV:** Final items on the Sexual Intention Questionnaire for Adolescent Boys (SIQ-AB)

Item	Question
siq1	I expect to have sex with my partner.
siq2	I intend to have sex with my partner.
siq3	I would like to have sex now if I could find a partner who would do it with me.
siq4	I would like to have sex to see what it is like.
siq5	I know when I can have sex.
siq6	I know where I can have sex.
siq7	Whether to have sex or not is entirely up to me.
siq8	I can decide on my sexual activity.
siq9	Most of my friends think that men are allowed to have sex before marriage.
siq10	Most of my friends think it is mature to practice sex at my age.
siq11	Most of my friends think that youths who have never been involved in having sex before marriage are not-up-to-date.
siq12	Most of my friends think that you can have sex before marriage if you are in love.
siq13	I believe youths who have never been involved in having sex before marriage are not-up-to-date.
siq14	Youths can have sex if they are unable to control their sexual desire.
siq15	Youths can have sex provided they use methods to stop pregnancy.

### DISCUSSION

The concerning trend is the decreasing age of adolescents who take risks of having sex when they are still young.<sup>33</sup> There are limited instruments targeted specifically to adolescent boys. The aim of this study was to assess the reliability and validity of the Sexual Intention Questionnaire for Adolescent Boys (SIQ-AB) to measure knowledge, permissive attitude, social norms, and self-efficacy toward sexual intention. The overall finding suggests four domains with 15 items to measure knowledge, permissive attitude, social norms, and self-efficacy toward sexual intention among Malaysian adolescent boys. In light of these findings, the SIQ-AB can be considered a reliable and practical method to measure Malaysian adolescent boys' sexual intentions.

Studies have shown that practitioners rarely ask about different aspects of adolescent sexuality since they do not know how to handle the situation and do not want to offend their young clients.<sup>34,35</sup> Conversely, adolescents' concerns and inquiries about their sexuality are growing.<sup>36</sup>

However, several studies have focused on how adolescents could respond to inquiries about their sexual orientation or what kinds of queries might be most appropriate. In order to comprehend how they react to sex better, this study validates a questionnaire originally developed to assess sexual intention.<sup>10</sup>

The current SIQ-AB solely focuses on adolescent boys. Muhammad's previous questionnaire was targeted at adolescents aged 18 years old and above.<sup>10</sup> Thus the researcher, hypothesized there are items that might not be suitable for adolescents below 18 years old. The current YSI-Q questionnaire used in Malaysian context, measured sexual intention among young people above 18 years old.<sup>10</sup> Since the peak age for sexual debut among adolescent worldwide is between 15-17 years old, and in Malaysia as low as 14 years old, there is a need to design questionnaire for this younger group. Hence, the availability of the SIQ-AB questionnaire, which targets adolescent boys between 13-17 years old, is suitable for a country like Malaysia. In the context of this study, early detection of sexual experience among younger age group can be used to plan first line prevention programmes.

In face validity, one item *'I believe that having sex for the first time is the best'* was excluded by the expert panel. The panel expert perceived that this item may encourage adolescents to have sex at an early age, which is culturally inappropriate. This was supported in a study which stated that in Asian countries, sex is prohibited at an early age and culturally inappropriate.<sup>37</sup> Premarital sex is forbidden in most major religions. In Islam, the person who commits premarital sex is committing 'zina' (adultery) which is considered a major sin.<sup>38</sup>

In this study, two items pertaining to the Social Norm; *'Most of my friends think that you can have sex before marriage if you are in love'* and *'Most of my friends think female youths do not have to maintain their virginity'*, were loaded in Attitude factor. Theoretically, social norms and attitude are two different definitions, but in the context of Malaysian adolescent boys, it could be the same, in how you practice and follow it. When individuals are in groups, there are certain rules, norms, or beliefs about proper attitude or

behaviour, and they may have certain behaviour regarding the reference group.<sup>39</sup> In adolescents, sexual behaviour is becoming more common. Thus, peer norms around sexual behaviour are likely more permissive than the norm established by parents.<sup>40</sup> In other words, peer norms are the individual's perceptions on whether close friends and family members believe he or she should engage in the behaviour. These perceptions are said to reflect the level of social pressures placed on a person to adopt a particular attitude or behaviour.<sup>41</sup>

Another two items originated from Attitude ie *'Teenagers need to have sex before marriage to ensure that the future partner is suitable'*, and Sexual Intention ie *'I want to have sex with my partner'* were removed. The removed sexual intention item is in accordance with Malaysian Child Act 211 (611) which stated that the consensual age for sex is 18 years old and above.<sup>42</sup> Hence, the item *'I want to have sex with my partner'* in this study is inappropriate for adolescents below 18 years old.

Developing a measurement tool using a behavioural theory such as TPB to assess sexual behaviour could help to design a tailored intervention targeted to adolescent boys. This is important as adolescent boys are at high risk for unhealthy sexual behaviour consequences.<sup>7,33</sup> While there may be some overlap with tools designed specific attention to both gender, boys may be pressured to conform with societal expectations of masculinity and traditional gender roles.<sup>7</sup> A new tools such as SIQ-AB could explore how these expectations influences boys' self-perception, relationships, emotional, expression and behaviours while also promoting healthy masculinity and challenging harmful stereotypes.

Besides some research suggest that adolescent boys are more likely than girls to engage in risk-taking behaviours, such as substance use and unsafe sexual practices. Tools for adolescent boys should provide strategies for assessing risks, making informed decisions, and resisting peer pressure to engage in risky behaviours.<sup>5,43</sup> In addition, the conduct of sex education for adolescent boy and girls should be separated to avoid embarrassment and discomfort.

Overall, the SIQ-AB instrument for adolescent boys had relatively good support for the four-factor model and 15 items which explained 65.7% of the variance. Internal consistency for the four-factor model (sexual intention, self-efficacy, social norm, and attitude) and 15 items were acceptable. According to the Theory of Planned Behaviour (TPB) introduced by Ajzen and Fishbein in 1988, predictions of behavioural performance are influenced by intentions, self-efficacy, social norms, attitude, and the perception of control over a conduct. Intentions are also hypothesized to be predicted by self-efficacy, attitudes, and subjective norms.<sup>44</sup> This showed that SIQ-AB instrument theory based-instrument supported by TPB construct. For example, study conducted in Tehran, Iran assessed the effect of TPB construct based educational intervention on attitude, social norms, parental control, behavioural control, and sexual intention among adolescent girls.<sup>45</sup> Furthermore, every TPB construct was essential in helping the students adopt better sexual and reproductive health practices.

## CONCLUSION

The finalized Sexual Intention Questionnaire for Adolescent Boys (SIQ-AB) has 4 domains and 15 questions. Acceptable psychometric characteristics, strong internal consistency, and convergent and composite validity are all features of the sexual intention questionnaire for adolescent boys. It is intended that by making the questionnaire available, other academics may further validate it and possibly apply it in their studies.

## FUNDING

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## INSTITUTIONAL REVIEW BOARD (ETHIC COMMITTEE)

Ethical approvals were obtained from the National Medical Research Register (NMRR) [NMRR ID-22-00010-DIT], and institutional Medical Research Ethics Committee (MREC) [UNIMAS/NC-21.02/03-02 Jld.3 (85)].

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## REFERENCES

1. Tilahun M, Ayele G. Factors associated with age at first sexual initiation among youths in Gamo Gofa, South West Ethiopia: a cross sectional study. *BMC Public Health*. 2013;13(1).
2. Allen C, Edwards P, Gennari F, Francis C, Caffè S, Boisson E, et al. Evidence on delay in sexual initiation, multiple partnerships and condom use among young people: review of caribbean HIV behavioural studies. *West Indian Medical Journal*. 2014 Jun 27;62(4):292–8.
3. Institute for Public Health. National Health & Morbidity Survey 2022. Adolescent Health Survey [Internet]. Shah Alam; 2022. Available from: [www.iku.gov.my/](http://www.iku.gov.my/)
4. Furlanetto MF, Ghedin DM, Gonçalves TR, Marin AH. Individual and contextual factors associated with sexual initiation among adolescents. *Psicologia: Reflexao e Critica*. 2019 Dec 1;32(1):1–13.
5. M.R. Othman, A. R. Mohammad Roose, S. Abdullah, N. N. Abdul Majid, I. S. Mohd Razali, W. N. I. Wan Husin. Use of Adolescent problem and risk behaviours inventory (IPERI) to predict the influence of personal problems on risky behaviour among adolescent in Sarawak, Malaysia. *Journal of Cognitive Sciences and Human Development*. 2018 Sep;4(1):35–40.
6. Pakianathan P. Faktor-faktor yang mempengaruhi salah laku seksual dalam kalangan pelajar sekolah menengah. [theses]. [Tanjung Malim, Perak]: Universiti Pendidikan Sultan Idris; 2016.
7. Morrell R, Jewkes R, Lindegger G. Hegemonic masculinity/masculinities in South Africa: Culture, power, and gender politics. *Men Masc*. 2012 Apr;15(1):11–30.



8. Arruda EPT, Brito LGO, Prandini TR, Lerra MR, Reis RM Dos, Barcelos TMR, et al. Sexual practices during adolescence. *Revista Brasileira de Ginecologia e Obstetricia*. 2020 Nov 1;42(11):731–8.
9. Perestroika GD, Prabandari YS, Wilopo SA. Sexual Intercourse Among Early Adolescents in Semarang, Central Java, Indonesia: Survey Using RDS. *Asia Pac J Public Health*. 2022 Mar;34(2–3):262–5.
10. Muhammad NA, Shamsuddin K, Mohd Amin R, Omar K, Thurasamy R. Questionnaire development and validity to measure sexual intention among youth in Malaysia. *BMC Public Health*. 2017 Feb 2;17(1):2–10.
11. Fa'iza A, Draman S, Abd Aziz KH, Zainuddin Nurul Akmanidar, Muhammad NA. Predicting sexual intention to engage in premarital sex among late adolescent in Kuantan government secondary schools: An application of Theory of Planned Behaviour. *IIUM Medical Journal Malaysia*. 2020 Dec 13;19(1):109–16.
12. Baudouin BS, Wongsawat P, Archin S, Sudnongbua S. Factors perceived to affect intention of sexual behaviours among junior high school students in Muang District, Thailand. *Cogent Education*. 2021;8(1).
13. Lubis R, Hinduan ZR, Jatnika R, Baydhowi B, Agustiani H. The development and initial validation of the Youth Sexual Intention Scale: Indonesian Version. *The Journal of Health Care Organization, Provision and Financing*. 2022 Mar 9;59:1–14.
14. McFarland MJ, Uecker JE, Regnerus MD. The role of religion in shaping sexual frequency and satisfaction: Evidence from married and unmarried older adults. *J Sex Res*. 2011 Mar;48(2–3):297–308.
15. Gorusch RL. *Factor Analysis*. 2nd ed. Gorusch RL, editor. New York: Hillsdale, NJ: Lawrence Erlbaum Associates; 1983.
16. Polit DF, Beck CT. The content validity index: Are you sure you know what's being reported? critique and recommendations. *Res Nurs Health*. 2006 Oct;29(5):489–97.
17. Lawshe CH. A quantitative approach to content validity. *Pers Psychol*. 1975 Dec;28(4):563–75.
18. Churchill GA. A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research*. 1979 Feb;16(1):64.
19. Ali Memon M, Ting H, Cheah JH, Thurasamy R, Chuah F, Huei Cham T. Sample size for survey research: Review and recommendations. *Journal of Applied Structural Equation Modeling*. 2020;4(2):2590–4221.
20. Gray CD, Kinnear PR. *IBM SPSS statistics 19 made simple*. Gray CD, Kinnear PR, editors. New York, USA: Psychology Press; 2012.
21. Bryant FB, Yarnold PR. *Principal components analysis and exploratory and confirmatory factor analysis*. 1st ed. Bryant FB, Yarnold PR, editors. Vol. 1. Washington: American Psychological Association; 1995. 99–136 p.
22. Worthington RL, Whittaker TA. *Scale Development Research*. *Couns Psychol*. 2006 Nov 30;34(6):806–38.
23. Hair, Babin BB, Anderson RE, Black WC. *Multivariate data analysis*. 8th ed. Hair J, Babin BB, Anderson RE, Black WC, editors. United Kingdom: Annabel Ainscow; 2018.
24. Joreskog KG, Sorbom D. *LISREL 8: structural equation modelling with the SIMPLIS command language*. Joreskog KG, Sorbom D, editors. Lincolnwood, USA: Scientific software international: Lawrence Erlbaum Associates Inc; 1993. 1–94 p.
25. Bentler PM. Comparative fit indexes in structural models. *Psychol Bull*. 1990;107(2):238–46.
26. Browne MW, Cudeck R. Alternative Ways of Assessing Model Fit. *Sociol Methods Res*. 1992 Nov 29;21(2):230–58.
27. Bryne BM. *Structural equation modelling with AMOS. Basic concepts, applications and programming*. 2nd ed. Bryne BM, editor. New York: Routledge Taylor & Francis Group; 2010. 3–15 p.
28. Henseler J, Ringle CM, Sarstedt M. A new criterion for assessing discriminant validity in variance-based structural equation modeling. *J Acad Mark Sci*. 2015 Jan 1;43(1):115–35.
29. Hair, Black WC, Babin BJ, Anderson RE. *Multivariate data analysis*. 7th ed. Hair J, Black WC, Babin BJ, Anderson RE, editors. Pearson Publishing; 2010.
30. Miller LeslieA, Lovler RobertL. *Foundations of psychological testing: A practical approach*. 6th ed. Miller LeslieA, Lovler RobertL, editors. Los Angeles,

- USA: SAGE Publications; 2020.
31. Rubio DM, Berg-Weger M, Tebb SS, Lee ES, Rauch S. Objectifying content validity: Conducting a content validity study in social work research. *Soc Work Res.* 2003 Jun 1;27(2):94–104.
  32. Awang Z. Structural equation modelling using AMOS graphic. 2nd ed. Awang Z, editor. Kuala Lumpur: Universiti Teknologi MARA Press; 2012. 1–167 p.
  33. Talib J, Mamat M, Ibrahim M, Mohamad Z. Analysis on Sex Education in Schools Across Malaysia. *Procedia Soc Behav Sci.* 2012 Oct;59:340–8.
  34. Lena SM, Wiebe T, Ingram S, Jabbour M. Pediatricians' knowledge, perceptions, and attitudes towards providing health care for lesbian, gay, and bisexual adolescents. *Ann R Coll Physicians Surg Can.* 2002 Oct;35(7):406–10.
  35. Perrin EC, Cohen KM, Gold M, Ryan C, Savin-Williams RC, Schorzman CM. Gay and lesbian issues in pediatric health care. *Curr Probl Pediatr Adolesc Health Care.* 2004 Nov;34(10):355–98.
  36. Schuster MA. Communication between adolescents and physicians about sexual behavior and risk Prevention. *Arch Pediatr Adolesc Med.* 1996 Sep 1;150(9):906.
  37. Cavazos-Rehg PA, Krauss MJ, Spitznagel EL, Schootman M, Cottler LB, Bierut LJ. Substance use and the risk for sexual intercourse with and without a History of teenage pregnancy among adolescent females. Missouri; 2011.
  38. Ping Wong L. An exploration of knowledge, attitudes and behaviours of young multiethnic Muslim-majority society in Malaysia in relation to reproductive and premarital sexual practices. *BMC Public Health [Internet].* 2012;12(865):1–13. Available from: <http://www.biomedcentral.com/1471-2458/12/865>
  39. Christina Y, Yasa NNK. Application of theory of planned behavior to study online booking behavior. *International Journal of Data and Network Science.* 2021 Jun 1;5(3):331–40.
  40. Wagenaar C, Florence M, Adams S, Savahl S. Factors influencing the relationship between alcohol consumption and risky sexual behaviour among young people: A systematic review. *Cogent Psychol.* 2018 Jan 1;5(1):1–26.
  41. Shneor R, Munim ZH. Reward crowdfunding contribution as planned behaviour: an extended framework. *J Bus Res.* 2019 Oct 1;103:56–70.
  42. The Commissioner of Law Revision. Law of Malaysia (Act 611) Child act 2001 [Internet]. 5th ed. The Commissioner of Law Revision, editor. Vol. 5, Malaysian government . Kuala Lumpur: Percetakan Nasional Malaysia; 2006 [cited 2023 Oct 12]. Available from: <https://www.ilo.org>
  43. Potard C, Courtois R, Rusch E. The influence of peers on risky sexual behaviour during adolescence. *Eur J Contracept Reprod Health Care.* 2008 Sep;13(3):264–70.
  44. Ajzen I. From intentions to actions: a theory of Planned Behaviour. 1st ed. Ajzen I, editor. SSSP Springer series in social psychology; 1985. 11–39 p.
  45. Darabi F, Hossein Kaveh M, Khalajabadi Farahani F, Yaseri M, MajlessiMD F, Shojaeizadeh D. Reproductive health in Iranian adolescent girls: A randomized controlled trial. *Journal of Research in Health Sciences .* 2017;17(4):400.