

## RESEARCH ARTICLE

# Reliability and Validity of the Malay Version of a Modified Smoking Self-Efficacy Questionnaire among Bruneian Secondary Students

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### Abstract

**Introduction:** The 12-items Smoking Self-Efficacy Questionnaire (SEQ-12) has been shown to be a valid and reliable instrument to assess confidence in one's ability to refrain from smoking. However, although such measures have been validated worldwide, most of them have not been culturally and linguistically adapted for use among Malay communities. The objective of this study was therefore to modify the SEQ-12 according to the Bruneian context for cultural adaptation for use among Bruneian adolescents, and assess the validity and reliability of the Malay translated version among secondary students. **Methods:** The original English version of the SEQ-12 was modified according to Bruneian context, translated and back-translated into and from the Malay language. The Malay version was then pre-tested and finally distributed to 40 purposively selected students in two secondary schools in Bandar Seri Begawan, Brunei Darussalam. Reliability was determined using Cronbach's alpha for internal consistency, while to assess the construct validity, an exploratory principle component factor analysis with varimax rotation was applied. Test-retest reliability was assessed with the students and tested using the intraclass correlation coefficient (ICC). **Results:** In total, 31 students participated with the initial questionnaire and the test-retest reliability. Exploratory factor analysis revealed two factors, representing two constructs as in the original questionnaire. Cronbach's alpha co-efficients for the first and second factors were 0.87 and 0.92, respectively. The test-retest reliability test showed an ICC of 0.98 (95%CI: 0.96, 0.99). **Conclusions:** The Malay version of the M-SEQ-12 is a valid and reliable scale, with potential applications in both research and clinical settings. It is a useful instrument for measuring self-efficacy regarding avoidance of smoking among Bruneian secondary students. Further analysis is necessary to assess the concurrent validity of the M-SEQ-12.

**Keywords:** Reliability- validity- smoking- self-efficacy- Brunei

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### Introduction

Cigarette smoking is one of the most leading causes of premature and preventable death worldwide (World Health Organization, 2012). It is well-known for causing a number of cancers, cardiovascular diseases and chronic obstructive pulmonary disease (COPD) (World Health Organization, 2014). According to the World Health Organization (WHO), around 5.4 million of mortalities per year are attributed to smoking-related diseases, 70% of which occurred in "developing" countries (World Health Organization, 2012). In Brunei Darussalam, smoking-related diseases has been the primary cause of mortality in the past three decades (Ministry of Health, 2013) and a recent report from WHO has indicated that the prevalence of smoking, particularly among the adolescents remained increasing at an alarming rate. There was a significant increased from 8.9% in 2013 to 11.4%

in 2014, with higher prevalence found in male (17.8%) than in female (4.8%) (World Health Organization, 2015).

Ample of studies have investigated factors associated with smoking among adolescents, and many have emphasized that level of self-efficacy to resist smoking is one of the most significant factors contributing to adolescents smoking (Rahman et al., 2011; Freedman et al., 2012; Tang and Loke, 2013; So and Yeo, 2015; Talip et al., 2016b). The term "self-efficacy" here can be defined as the confidence a person has in his or her ability to perform and sustain a certain behavior in a given situation (Spek et al., 2013). Studies reported that those who smoked more cigarettes had lower self-efficacy scores and were less confident in their ability to avoid smoking than those who smoked less (Hiemstra et al., 2011; Golestan and Abdullah, 2015).

In recent years, the concept of self-efficacy has been frequently employed in studies designed to explore the

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contribution of the level of confidence in the prediction of resistance to smoking, however, majorities have measured adolescents' smoking self-efficacy with the instruments developed for the adult population. Delveno et al. (2004) suggested that this approach should not be considered as always reliable and valid. Thus, Lawrance (1986) has suggested that there is a need to modify the instrument to reflect age-related differences for the adolescent population. And that, the instrument must also first be subjected to test of both validity and reliability.

The 12-item Smoking Self-Efficacy Questionnaire (SEQ-12) has been shown to be a valid and reliable instrument to assess confidence in one's ability to refrain from smoking in a variety of different situations involving both internal (e.g. feeling stresses) and external stimuli (e.g. presence of stimuli associated with cigarettes and other people smoking) (Etter et al., 2000; Lazuras et al., 2009). It has demonstrated test-retest reliability as well as content, construct, and predictive validity when used among a variety of populations (Etter et al., 2000). However, although such measures have been developed and validated worldwide, again most of them have not been culturally and linguistically adapted for use among the Malays. Limited effort has been made to translate these questionnaires into valid and reliable Malay language questionnaires. It is therefore, necessary to examine the validity and reliability of the measure in Malay version, before it can be adapted to Malay speaking communities. Hence, the aim of this study was to modify the SEQ-12 according to Bruneian context to culturally adapt the SEQ-12 for use particularly in Bruneian adolescents, as well as to assess its validity and reliability, which will be useful for future smoking related studies among secondary school students in Brunei.

## Materials and Methods

### Study Design

A quantitative study using a cross-sectional study design was conducted in August 2016.

### Participants

Participants were recruited from two government secondary schools in Bandar Seri Begawan. We included both male and female secondary school students from Year 7, 8, and 9. A total of 40 participants were recruited with purposive sampling to ensure a good variation among years or classes and gender. All potential participants and their parents were given a letter that comprised of participant information sheet (PIS) and consent form requesting their permission to participate in the study. The inclusion criteria were: participants with or without co-morbidity, able to read and write both Malay and English, capable of giving written informed consent and willing to fill two sets of the questionnaire for test and retest. Participants who were not able to read and write in both Malay and English, not capable of giving written informed consent and not willing to fill two sets of the questionnaire were excluded. In total, 31 students consented to participate in the study, the response rate is 77.5%.

### Data Collection Instrument

#### *The Modified Smoking Self-Efficacy Questionnaire (M-SEQ-12)*

The M-SEQ-12 is a modified version of the original Smoking Self-Efficacy Questionnaires (SEQ-12) developed by Etter et al., (2000). Similar to SEQ-12, M-SEQ-12 is a two-dimensional 12-item scale use to assess confidence in one's ability to refrain from smoking in a variety of different situations involving both internal (e.g. feeling stresses) (6 items; e.g. when I feel stressed, when I feel angry) and external stimuli (e.g. being with smoker) (6 items; e.g. when I am with smokers, when offered a cigarette) with a 5-point Likert scale (1= not at all sure to 5= absolutely sure). M-SEQ-12 scores are obtained by summing across all scale items. The scores range from 12 to 60, with higher scores indicating a high level of self-efficacy (greater behavior control to resist smoking) and lower score indicates a low level of self-efficacy (poor behavioral control to resist smoking).

In addition, information on age, gender, ethnicity, education level and current self-reported smoking status (smoker or non-smoker) was also obtained from the participants. Non-smoker in this context is defined as someone who, at the time of survey, does not smoke cigarette at all. While smoker is defined as someone who, at the time of survey, smokes cigarette, either daily or occasionally.

#### *Modification of Smoking Self-Efficacy Questionnaire (SEQ-12)*

To accommodate the questionnaires for use in Bruneian context, a modification on the SEQ-12 was made, with questions and/or words that are able to capture appropriate experience in our targeted Bruneian adolescents' culture (Cha et al., 2007; Sousa and Rojjanasrirat, 2011). The questionnaire was modified based on our previous exploratory study findings (Talip et al., 2016a). As a result, 6 items were retained ("When I feel the urge to smoke", "When I feel depressed", "When I am angry", "When I want to think about a difficult situation", "When I am with smokers" and "After a meal") and the remaining 6 items ("When I feel nervous", "When I feel very anxious", "Having a drink with friends", "Drinking beer, wine", "Having coffee or tea" and "When celebrating something") were discarded and replaced by items ("When seeing someone else smoking", "When offered a cigarette", "When I need to concentrate", "When my friends/family want me to smoke", "When I have lots of extra pocket money" and "When I am bored or waiting").

Analysis of the discarded items indicated that they were not relevant to the Bruneian adolescents' culture. For instance, we identified that smoking when "Having a drink with friends", "Having coffee or tea", "When celebrating something" and "Drinking beer, wine" in the SEQ-12 were not mainly and frequently practiced by the Bruneian adolescents. Furthermore, "Drinking beer, wine" was deemed inappropriate for Muslims participants who make up majority of the Bruneian population. Muslims are strictly prohibited from drinking alcohol and wine. We acknowledge the need to be sensitive to cultural and religious needs in our questionnaires. Instead in our

exploratory findings, we found participants were mainly unable to resist smoking when seeing someone else smoking, when offered a cigarette, when they need to concentrate, when bored or waiting and when they have lots of extra money. Therefore, we replaced and ensured that all categories of these high risk situations identified in our previous qualitative data were represented in the scale (Talip et al., 2016a). In addition, we felt this was appropriate for our future studies in assessing current smoking-related studies among adolescents in Brunei.

#### *Translation*

This study used a forward-backward translation procedure. In this procedure, a forward translation was produced from the original language (English) to Malay language. Translation was done by two researchers (T.T and N.K) who were fluent in both Malay and English, and back-translated into English language by an English school teacher (E.M) who was also fluent in Malay, to ensure high face validity. Any differences that existed among the three parties were discussed, and common consensus was achieved. The final version was reviewed by an expert in both languages (NS.K). To ensure comprehensibility, the final Malay version was then pre-tested on 5 students, with different smoking status and age, and who did not participate in the main study. Any questions which were difficult to understand were rephrased and discussed again with the translators in identifying the best possible wordings.

#### *Data Collection Procedure*

The study was conducted at a time and date convenient for participants' schedules and were held at their respective schools. Prior to the distribution of questionnaires, the participants were informed that their participation would not affect their study progress and re-assured regarding the anonymity and confidentiality of the outcome from the study. All questionnaires were self-administered, however assisted guidance was available from one of the authors (T.T) of this study and trained assistance (H.M) to assist the participants where necessary. Teachers were not allowed to be present while the survey was being administered, this is to further ensure the confidentiality and to reduce fear of reprisal among the participants. To ensure completeness of the returned questionnaires, an onsite checking was done.

Test-retest reliability was conducted among the same 31 students. These students were asked to remember a code name to maintain their anonymity. Two weeks after the initial testing, retesting was conducted by distributing the same questionnaire. The students were asked to use the same code as in the previous test. Less than 10 minutes was utilized to complete the questionnaires. The response rate for both first and second set of questionnaires was 100%.

#### *Data Analysis*

Data entry and analysis was done using IBM SPSS version 21 (SPSS Inc., IL, US). The P value was set at 0.05. Descriptive statistics were computed for demographic variables. Means and standard deviations

were calculated for normally distributed continuous variable, and frequencies and percentages for categorical variables. Total scores were obtained by summing across all 12 items. A test of normality was conducted, and an exploratory factor analysis of the 12 items questionnaire was performed using a principal component method with varimax rotation to identify the underlying factors of the questionnaire. Prior to this analysis, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity were analyzed to evaluate whether the data fulfilled the assumptions for carrying out a factor analysis.

Cronbach's alpha was analyzed to assess the internal consistency reliability of the questionnaire. An alpha of  $\geq 0.7$  was considered reliable (Schmitt, 1996; Spek et al., 2013). Test-retest reliability was analyzed using the intraclass correlation coefficient (ICC) for the sum scores. The values of the ICC vary from 1 (perfectly reliable) to 0 (totally unreliable) and an ICC of  $>0.7$  was considered acceptable (Al-Dubaai et al., 2012). In addition, a Bland-Altman plot was also used to confirm the agreement between the test and retest responses by calculating the mean differences between them. This method uses the mean difference between the two methods of measurement and the 95% limits of agreement as the mean difference ( $\pm 2SD$ ) (Bland and Altman, 1986).

#### *Ethical Considerations*

The study protocol was approved by the Pengiran Anak Puteri Rashidah Institute of Health Sciences Research Ethics Committee, Universiti Brunei Darussalam. Permission was also obtained from the Department of School Ministry of Education (MoE) Brunei Darussalam and school principals, prior to the commencement of this study. Considering the potential influence of the sensitive nature of the topic, reassurance regarding confidentiality, anonymity and their right to withdraw from the study at any time was re-emphasized to participants before the distribution of questionnaire.

## **Results**

#### *Socio-demographic Characteristics*

In total, thirty-one ( $n=31$ ) participants participated in the present study. Table 1 summarizes the demographic characteristics of the study participants. The median (IQR) age of the participants was 14.0 (2.0) years. The majority of the participants were male (67.7%), Malay (96.8%), non-smokers (67.7%) and from Year 9 students (41.9%). The mean (SD) level of self-efficacy, measured by the M-SES-12, was 47.0 (12.3), i.e., 23.9 (5.98) and 23.1 (7.42) for the first and second factor, respectively. The distribution of the participants' scores on the M-SEQ-12 is shown in Table 2.

#### *Construct Validity of the M-SEQ-12*

The exploratory analyses of all 12 items revealed 2 factors accounted for 68.2% of the total variance. The first factor accounted for 36.4% of the variance and consisted of 6 items representing "extrinsic self-efficacy scale" (items 7-12). Factor loading ranged from 0.45-0.92, and

Table 1. Socio-Demographic Characteristics of the Participants (n = 31)

Variable	Median (IQR)	n (%)
Gender		
Male		21 (67.7)
Female		10 (32.3)
Age (Years)	14.0 (2.0)	
13		8 (25.8)
14		14 (45.2)
15		7 (22.6)
16		2 (6.5)
Ethnicity		
Malay		30 (96.8)
Philippines		1 (3.2)
Education Level		
Year 7		6 (19.4)
Year 8		12 (39.7)
Year 9		13 (41.9)
Smoking Status		
Smoker		10 (32.3)
Non-smoker		21 (67.7)

none of these items loaded significantly onto the second factor (Table 3). While, the second factor included the remaining 6 items representing “intrinsic self-efficacy scale” (items 1-6) and accounted for 31.8% of the variance with factor loadings ranging from 0.50-0.87. The mean (SD) for the first and second factor were 23.9 (5.98) and 23.1 (7.42), respectively. The KMO measure of sampling adequacy statistic was 0.66 and Barlett’s test of Sphericity was significant ( $P < 0.001$ ), indicating that assumptions required for the factor analysis was met.

#### Internal Consistency and Test-Retest Reliability of the M-SES-12

The corrected item-total correlations and Cronbach’s alpha coefficient for all 12 items of the M-SES are given in Table 4. Overall, values for all item-total correlations for the first factor and second factor were significant and greater than 0.4; ranges between 0.44-0.89 and 0.52-0.78 respectively, indicating that each scale of items had a good correlation with the other items comprising the overall scale score. On the other hand, Cronbach’s alpha coefficient was 0.93 for the total scale, 0.87 for the first factor and 0.92 for the second factor. Cronbach’s alpha coefficients for both factors were acceptable. With regards to the test-retest reliability, the analysis showed

Table 2. Distribution of Scores of the Participants on the M-SEQ-12 (n = 31)

Item		Score				
		1, n (%)	2, n (%)	3, n (%)	4, n (%)	5, n (%)
1	I can refuse it when I feel the urge to smoke. <i>Saya boleh menolaknya apabila saya mempunyai keinginan untuk merokok.</i>	2 (6.5)	4 (12.9)	3 (9.7)	8 (25.8)	14 (45.2)
2	I can refuse it when seeing someone else smoking. <i>Saya boleh menolaknya ketika saya melihat orang lain merokok.</i>	3 (9.7)	4 (12.9)	4 (12.9)	5 (16.1)	15 (48.4)
3	I can refuse it when I feel stressed. <i>Saya boleh menolaknya ketika saya merasa tertekan.</i>	0 (0.0)	4 (12.9)	5 (16.1)	4 (12.9)	18 (58.1)
4	I can refuse it when I am angry. <i>Saya boleh menolaknya ketika saya merasa marah.</i>	3 (9.7)	1 (3.2)	3 (9.7)	5 (16.1)	19 (61.3)
5	I can refuse it when I need to concentrate. <i>Saya boleh menolaknya ketika saya perlu menumpukan perhatian.</i>	1 (3.2)	2 (6.5)	6 (19.4)	7 (22.6)	15 (48.4)
6	I can refuse it when I want to think about a difficult problem. <i>Saya boleh menolaknya ketika saya hendak memikirkan masalah yang sukar.</i>	1 (3.2)	7 (22.6)	3 (9.7)	5 (16.1)	15 (48.4)
7	I can refuse it when I am with smokers. <i>Saya boleh menolaknya ketika saya bersama dengan perokok.</i>	4 (12.9)	5 (16.1)	3 (9.7)	3 (9.7)	16 (51.6)
8	I can refuse it when my friends/family want me to smoke. <i>Saya boleh menolaknya apabila rakan-rakan/keluarga saya menyuruh saya untuk merokok.</i>	2 (6.5)	4 (12.9)	5 (16.1)	5 (16.1)	15 (48.4)
9	I can refuse it after a meal or after sports. <i>Saya boleh menolaknya selepas makan atau selepas bersukan.</i>	4 (12.9)	3 (9.7)	2 (6.5)	5 (16.1)	17 (54.8)
10	I can refuse it when I am bored or waiting. <i>Saya boleh menolaknya ketika saya bosan atau ketika sedang menunggu.</i>	4 (12.9)	3 (9.7)	4 (12.9)	4 (12.9)	16 (51.6)
11	I can refuse it when offered a cigarette. <i>Saya boleh menolaknya ketika ditawarkan rokok.</i>	6 (19.4)	3 (9.7)	3 (9.7)	5 (16.1)	14 (45.2)
12	I can refuse it when I have lots of extra pocket money. <i>Saya boleh menolaknya ketika saya mempunyai banyak lebihan wang saku.</i>	2 (6.5)	3 (9.7)	2 (6.5)	4 (12.9)	20 (64.5)

Table 3. Exploratory Factor Analysis of 12-Items of the M-SEQ-12 Using Principal Component Extraction with Varimax Rotation

Scale	Item	Loading on 2 factors	
		F1	F2
Factor 1: 'Intrinsic Self-Efficacy Scale'	Q7. When I am with smokers	0.44	0.65
	Q8. When my friends/family want me to smoke		0.87
	Q9. After a meal or after sports		0.64
	Q10. When I am bored or waiting		0.85
	Q11. When offered a cigarette		0.8
	Q12. When I have lots of extra pocket money.		0.5
Factor 2: 'Extrinsic Self-Efficacy Scale'	Q1. When I feel the urge to smoke	0.82	
	Q2. When seeing someone else smoking	0.75	0.45
	Q3. When I feel stressed	0.82	
	Q4. When I am angry	0.89	
	Q5. When I need to concentrate.	0.92	
	Q6. When I want to think about a difficult problem.	0.45	

Note, Factor loading below 0.40 is omitted for clear presentation.

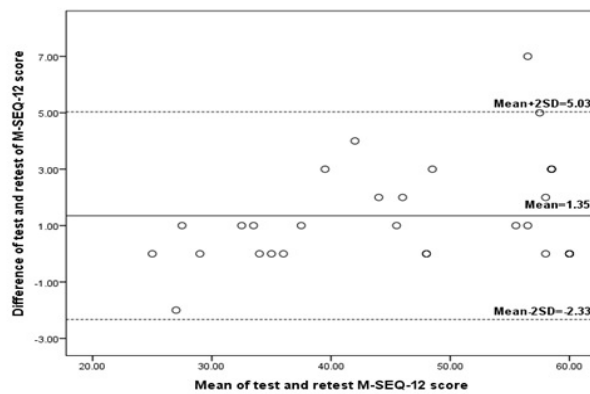


Figure 1. Bland-Altman Plot for the Test and Re-Test Measurements of the M-SEQ-12 Total Score

that the Malay version of the total M-SEQ-12 score had an ICC of 0.98 (95 % CI: 0.96, 0.99); 0.98 each for both first and second factor (Table 5). In addition, based on the Bland-Altman plot, the mean difference in the total M-SEQ-12 score between the test and retest of the

Table 4. Item-Total Correlation and Cronbach's Alpha Coefficient for the M-SEQ-12

Scale	Item	Item-total correlation	Cronbach's alpha
Factor 1	Q7. When I am with smokers	0.82	0.87
	Q8. When my friends/family want me to smoke	0.79	
	Q9. After a meal or after sports	0.83	
	Q10. When I am bored or waiting	0.89	
	Q11. When offered a cigarette	0.84	
	Q12. When I have lots of extra pocket money.	0.44	
Factor 2	Q1. When I feel the urge to smoke	0.65	0.92
	Q2. When seeing someone else smoking	0.78	
	Q3. When I feel stressed	0.63	
	Q4. When I am angry	0.74	
	Q5. When I need to concentrate.	0.73	
	Q6. When I want to think about a difficult problem.	0.52	

Table 5. Descriptive Statistics and Test-Retest Reliability of the Total M-SEQ-12 Scores

	Mean (SD)	Difference (Test - Retest)		ICC (95% CI) <sup>a</sup>
		Mean (SD)	(Min., Max.)	
Test	47.0 (12.3)	1.35 (1.84)	(-2.00, 7.00)	0.98 (0.96, 0.99)
Re-test	45.6 (11.6)			

a Single-measure intraclass correlation using one-way random ANOVA model

questionnaire was 1.35 and the 95% limits of agreement were 5.03 and -2.33 (Table 5; Figure 1). It can be seen that all of the participants' total scores lay within the 95% limit of agreement except one.

## Discussion

The aim of the present study was to develop an adapted and a modified Malay version of the SEQ-12 scale. This study successfully modified, translated and validated the Malay version of the M-SEQ-12 and it is applicable to be used among Bruneian adolescents. Generally, modification was made as to ensure its appropriateness with our targeted local Bruneian adolescents' culture and experiences. A forward and backward translation process was then performed with the aim to achieve equivalence between the English and translated Malay version. In addition, item relevancy and acceptability and content validity were also considered throughout the process.

During the administration of the questionnaire, the participants were asked to report on any items that were unclear. None of them had difficulties understanding or answering the items on the M-SEQ-12, indicating that the translation was good.

Overall, the present study indicated that the Malay version of the M-SEQ-12 was a valid and reliable instrument, and could easily be applied for smoking-related studies such as smoking intention, smoking cessation and smoking relapse studies among the adolescents in Brunei. It is also easy to understand and well accepted by smoker and non-smoker participants. The factor analysis with a good KMO value and a significant Barlett's test of Sphericity, indicated that there was an adequate sample size for the validation of the M-SEQ-12 and good construct validity of the questions. The results of exploratory factor analysis showed that the Malay version of the M-SEQ-12 for two factors accounted for 68.2% of the variance (36.4% and 31.8%, respectively).

To measure reliability, Cronbach's alpha coefficient was used. Reliability refers to the accuracy and precision of a measurement procedure (Van Lummel et al., 2016). The alpha coefficient value ranged from 0 to 1; the greater the alpha level, the more reliable is the scale (Field, 2006; Garson, 2008). This study revealed that the Malay version of the M-SEQ-12 has a high internal consistency for all 12 items ( $\alpha = 0.93$ ) and both the internal stimuli ( $\alpha = 0.92$ ) and external stimuli ( $\alpha = 0.87$ ) subscales. Though these Cronbach's alphas were slightly lower from the original version but it was still strong and acceptable. The original version of SEQ-12 has high internal consistency for both the internal stimuli ( $\alpha = 0.95$ ) and external stimuli ( $\alpha = 0.94$ ) subscales (Etter et al., 2000). According to

Schmitt (1996), a Cronbach's alpha of 0.70 or more was considered acceptable (Schmitt, 1996), this therefore confirmed the adequacy of the internal consistencies of the M-SEQ-12 scales.

Nevertheless, the value of the Cronbach's alpha for both internal and external scale in our study was higher compared to those obtained in the Chinese-translated version of SEQ-12 (internal stimuli ( $\alpha = 0.88$ ) and external stimuli ( $\alpha = 0.77$ ) subscales) (Leung et al., 2008) and Thailand-translated version (internal stimuli ( $\alpha = 0.92$ ) and external stimuli ( $\alpha = 0.92$ ) subscales) (Wongsaeng, 2015). Thus, our results seem to be comparable to those obtained in developed nations, and in some instances higher than those obtained in developing countries (Christie and Etter, 2001).

Interestingly, our Malay version of the M-SEQ-12 had an ICC of 0.98; 0.98 each for internal and external stimuli subscales, which was higher compared to those obtained from the original version, where the test-retest correlation coefficients were 0.95 and 0.93 for the internal and external stimuli subscales, respectively (Etter et al., 2000). This therefore demonstrates that M-SEQ-12 has an excellent test-retest reliability.

In addition, based on the Bland-Altman plot, the mean difference in the total M-SEQ-12 scores between the test and the retest was 1.35, indicating good agreement between both test and retest administrations of the M-SEQ-12 questionnaire. Only one score lay outside the 95% limits of agreement and the rest of the test and retest scores lay within the 95% limits of agreement. This further suggested complete agreement between the results.

#### Limitations of the study

Several limitations were encountered. Firstly, the findings have limited generalizability as only two government schools were selected and sample size was rather small. Secondly is the absence of concurrent validity assessment. Lastly, our sample was rather homogenous in terms of ethnicity as majority of participants were Malay.

In conclusions, assessing the reliability and validity of the modified and translated version is important for development of tailored interventions based on individual needs. This measure may be utilized for smoking-related studies such as smoking intention, smoking cessation and smoking relapse studies among the adolescents in Brunei. The items should be able to convey the breath of the construct, at the same time its psychometric properties. The translated version accomplishes both goals. Results of coefficient alphas were good, showing between 0.87-0.92, indicating a good internal consistency and test-retest reliability were excellent, indicating high intraclass reliability. In conclusion, our study demonstrated that the Malay version of the M-SEQ-12 is a reliable and valid measure of self-efficacy towards smoking for use among secondary students in Brunei. This is important in light of the recognition that reduction of smokers in Brunei is an important national health agenda. However, future research should involve larger, diverse and heterogeneous samples to rule out the effect of sample homogeneity on the results. For future studies, research on the concurrent validity of this measure is recommended.

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#### Statement conflict of interest

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