Translation, Validity, and Reliability of the Malay Version of the Adolescent Healthy Lifestyle Questionnaire

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Submitted: 20 April 2022, Accepted: 25 August 2022, Published: 24 September 2022
Volume 31, 2023. pp. 132–151. http://doi.org/10.25133/JPSSv312023.008

Abstract

The prevalence of non-communicable diseases has increased worldwide, and their complications pose a significant threat to Malaysia, creating the leading causes of morbidity. Due to that, many instruments were developed to assess a healthy lifestyle in general; however, the measurement issue remains important for scholars, especially when it involves different samples. Furthermore, the quality of instruments is influenced by their validity and reliability. This study aims to translate, adapt, and establish validity evidence and reliability for the Malay version of the Adolescents' Healthy Lifestyle Questionnaire in Klang Valley, Malaysia. The validity evidence was tested using exploratory factor analysis (EFA) and reliability using Cronbach's alpha. There are 11 components: healthy diet, physical activity, substance abuse, health responsibility, sleep quality, interpersonal relationships, social health, mental health, accident prevention, environmental health, and suicidal tendencies, with 116 items created for the instrument. From EFA, ten components with 64 items of the healthy lifestyle questionnaire among adolescents explained 55.60% of the variance in the pattern of relationships among the items. All ten components had high reliability (α =. 733 — α = .906). Hence, the items can be used for data collection to understand the practices of a healthy lifestyle for future research.

Keywords

Adolescents; healthy lifestyle; non-communicable chronic diseases; reliability; validity

Introduction

The adolescent phase is critical due to the transformation from childhood to adulthood because of biological and psychological modifications to comply with maturation (Patton et al., 2016). This is the start of the life stage when adolescents begin practicing their independence from parental monitoring. They also start to explore their sense of self, according to Erickson's psychosocial stage development. Most parents start to give their children more autonomy in their life at this point, allowing them to make their own decisions in all areas, including health behavior. A healthy lifestyle is one of the significant factors in the development of young people. Practicing positive health behaviors will improve adolescents' long-term health and well-being. As a result, now is the time for individuals to take greater responsibility for their physical well-being.

New research has connected an unhealthy lifestyle to a risk of developing chronic diseases development in adolescents (Al-Lawati et al., 2008). While Maharaj et al. (2009) stated unhealthy lifestyles among teenagers cause half of all early preventable deaths. As a result, health-promoting research among teenagers has become significant (Wang et al. 2009) in keeping track of an adolescent lifestyle. New research has linked an unhealthy lifestyle to increasing the risk of chronic disease development. Thus, it has become a national priority to improve healthy lifestyle practices among adolescents to prevent or minimize non-communicable diseases and long-term adverse health effects. As Loprinzi et al. (2013) suggested, practicing a healthy lifestyle will enhance physical well-being and improve brain-related functions.

Most factors influencing an individual's health and quality of life are interrelated with lifestyles. Obesity and non-communicable diseases have been connected to unhealthy behaviors (Farhud, 2015). Hence, any proposed intervention programs should consider the relationship between lifestyle and health outcomes. Individuals, including adolescents, now rely on technology in their daily lives due to rapid changes in socioeconomic status and the advent of new technologies. Overuse and misuse of technology will encourage a sedentary lifestyle, a significant contributor to non-communicable diseases. Research among adolescents was done by the Institute for Public Health (2017), which reported the consumption of carbonated soft drinks among adolescents has increased from 29.4% in 2012 to 36.9% in 2017. Other related findings are as follows: internet addiction (29%), screen time for more than two hours per day (43%), overweight (15.2%), obese (13.3%), physically inactive (19.8%), sitting activities (50.1%) and consumption of fast foods (11.1%). The findings from the study recommended that teenagers' health behaviors are alarming. Long-term consequences of adolescent behaviors can lead to the development of non-communicable diseases later in life. Therefore, learning about adolescents' healthy-living knowledge and practices is essential. This data will subsequently be used to build effective tactics and preventive initiatives for this age range.

Questionnaires, scales, and indexes are used to assess a healthy lifestyle. The questionnaire assesses different intensity levels, such as how strongly a person agrees or disagrees with a statement. However, the subject of measurement continues to be an essential topic among scholars. To have precise data, the quality of instruments is vital, and the key to quality in measurement is validity and reliability. Validity refers to whether an instrument measures what it purports to measure, whereas reliability refers to the instrument's consistency. The

term validity within educational measurements has been debated for a long time by scholars (Cizek, 2016; Kane, 2016; Messik, 1995).

For a long time, academics have recognized and debated the issue of validity in educational measurements (Cizek, 2016; Kane, 2016; Messik, 1995). Validity is the degree to which evidence and theory support the interpretation of a test score for the intended purpose (American Educational Research Association et al., 2014). As a result, validity is the quality of the measuring instrument's suggested interpretation and application rather than a property of the measurement device itself. Kane (2016) stated that just because a test has been validated for one purpose does not indicate it has been validated for another. Knekta et al. (2019) likewise mentioned that the instrument might be validated for a specific demographic and purpose, but this does not imply that it would be used in that population. Straub et al. (2004) asserted that instruments need to be validated even if they were adopted from literature because the instrument might not have been initially adequately validated, and the instruments would have been modified to fit the purpose of the study; therefore, the original validity might be affected.

Another vital factor is that the questionnaire's validation may be outdated as cultures, economies, and educational systems vary over time. Furthermore, with the global pandemic due to COVID-19, lifestyle changes and eating habits have influenced many people, especially young adults. Quarantined lockdowns and movement restrictions may lead to other risks like stress and depression, apart from obesity due to snacking. Therefore, a healthy lifestyle questionnaire established in the 1980s for adolescents in the 2020s may not be accepted due to physical activity, technological improvement, extensive usage, and the expansion of fast-food outlets and food delivery systems.

Furthermore, the questionnaire must be easily understood for respondents to provide accurate responses. According to the cognitive model (Sudman et al., 2010), respondents must analyze the item, access relevant information from memory, develop a preliminary assessment, and transform the initial assessment into one of the response options. Hence, using the Malay language for the questionnaire in a population context is particularly important to ensure respondents clearly understand the items and provide precise options. Meanwhile, a translated questionnaire will increase the response rate among respondents (Moradi et al., 2010) because respondents will easily understand each item in the questionnaire. Besides that, using the population's primary language is essential to overcome the language barrier among the respondents.

Moreover, when conducting studies on groups whose first language is not English, it is standard practice to translate existing questionnaires if the purpose of the study and the research questions are similar to earlier studies (Reichenheim & Moraes, 2007; Sousa & Rojjanasrirat, 2011). Respondents' difficulty or failure to understand the items due to the language barrier will lead to misleading research findings. Thus, the translated questionnaire will enhance the understanding of the respondents and improve the validity and reliability of the data due to the accuracy of the respondents' options. Most scholars translated questionnaires into the population's primary language, especially involving health-related questionnaires. Consequently, the present study aims to establish new validity evidence and reliability in the target population while also trying to translate and adapt a few healthy lifestyle questionnaires. Therefore, translating, adapting, and validating the instrument will minimize measurement errors. Moreover, establishing the validity of evidence before employing an instrument for data collection is vital in ensuring that the instrument is appropriate for the research purposes and population.

Even though scholars have developed and validated a few scales related to a healthy lifestyle and physical activity among school children in Malaysia, for example, the Healthy Lifestyle Questionnaire Among Adolescents (Awang @ Muda et al., 2022), and Nutrition Knowledge, Attitude and Practice (NKAP) questionnaire (Dali et al., 2017), these scales do not measure most of the components of a healthy lifestyle. Apart from that, most of the healthy lifestyles studied in Malaysia only focus on parts of lifestyle behavior, such as eating practices and physical activity (Mohammadi et al., 2021), healthy lifestyle, and healthy eating (Sharif Ishak et al., 2020), and depression (Ahmad et al., 2020).

Moreover, age-appropriateness is an important question that underlies the health behaviors measurement in past studies. Are instruments that work for the general population appropriate for other age groups? (Gatz et al., 1987). Baumgartner et al. (2006) and Hashim (2015) suggested a valid instrument for one population should not be assumed to be valid for another. Miller (2014) similarly mentioned that a test is only valid for people similar in age, gender, and experience to those tested. Thus, developing a complete, valid, and reliable Malay version of the Adolescent Healthy Lifestyle Questionnaire among school children in Klang Valley, Malaysia, is essential.

Materials and methods

Step 1 – Preparation of scope and structure

A literature review on healthy lifestyles for teens was done to determine the scope of the questionnaire. Individual discussions with experts in healthy lifestyles and physical education lectures were also held to obtain a clearer understanding of the many topics covered by the questionnaire. Based on these facts, it was suggested that the questionnaire should incorporate 11 components in the Malay version of the Adolescent Healthy Lifestyle Questionnaire, such as healthy diet, physical activity, substance abuse, health responsibility, sleep quality, interpersonal relationships, social health, mental health, accident prevention, environmental health, and suicidal tendency. Healthy lifestyle measurement should comprise every domain or construct of the healthy lifestyle practice and fulfill the needs of a specific group. Physical activity, less time spent on multimedia, a balanced diet, and a lack of alcohol and cigarette intake are the significant behaviors associated with healthy lifestyles (Marques et al., 2015; Rayner et al., 2017; Remington et al., 2010).

Meanwhile, the Adolescent Healthy Lifestyle Questionnaire (Taymoori et al., 2012) combined seven sub-categories: life appreciation, health responsibility, nutrition, social support, physical activity, stress management, and safety related to health-promoting and protecting behaviors. Qidwai et al. (2010) added a few constructs, such as the total frequency of physical exercise at school and sports clubs, internet usage per week, smoking, depression, and bedtime. The measurement tools covered common health issues, lifestyles, and habits. Tabung et al. (2015) designed a healthy lifestyle index for Columbia cancer patients that included five modifiable lifestyle characteristics: smoking, alcohol intake, physical activity, diet, and body mass index (BMI). There will be two sections to the questionnaire: Section A contains questions regarding demographics such as age, gender, height, weight, and residence. Section B encompasses all the items to address all the variables to be measured. A healthy lifestyle assessment should include all domains or constructs of the healthy lifestyle practice and meet the needs of a specified population. The key behaviors associated with healthy lifestyles are

physical activity, reduced time spent on multimedia, a balanced diet, and a lack of alcohol and cigarette usage (Marques et al., 2015; Rayner et al., 2017; Remington et al., 2010).

Step 2 – Items development

Seeing as there was no available questionnaire in this population, a new one was designed for this study. Even if there are a few questionnaires for healthy lifestyles, their validity and reliability in terms of the population can be questioned due to cultural, educational, and linguistic dissimilarity, among other issues. Thus, designing a new set of questionnaires with appropriate and precise data from this population is essential. A few established instruments have been modified to suit the needs of the people, such as the Yatt Suicide Attitude Scale in Malaysia (Ibrahim et al., 2019) and the International Physical Activity Questionnaire (IPAQ-SF) in a study by Chung et al. (2018). The European School Survey Project on Alcohol and Other Drugs (ESPAD) was developed by Hibell et al. (2000). Two experts conducted forward translation. Back translations in English and Malay to guarantee that the adapted version and the original questionnaire were equivalents (Herdman et al., 1997). Following the approach, 11 components were identified: healthy eating, physical activity, health responsibility, substance abuse, sleep quality, interpersonal relationships, social health, and mental health are all significant. Furthermore, the researchers used the guidelines of item writing suggested by DeVellis (2017) and Di Iorio (2005). These principles are intended to ensure that the best possible items for a healthy lifestyle measure are created.

The closed-ended items containing a five-point Likert scale (1-Never to 5-Very Often) were used in this questionnaire (Manios et al., 2010). As a result, there are 116 items to measure 11 components of a healthy lifestyle. However, due to redundancy and ambiguous statements, 12 items needed to be deleted, and 104 remained. While there are 30 negative items, such as 29, 31, 32, 36, 37 (substance abuse); 40, 41, 42, 44, 46, 47, 48, 49, 50, 51, 52 (sleep quality); 85, 86, 87, 89 (environmental health); and 95, 96, 97, 98, 99, 100, 101, 102, 103, 104 (suicide ideation) out of the 104 items. All the negative items will be recorded (1 to 5, 2 to 4, 3 to 5). Back translation has been used in a study to translate items from existing questionnaires. The questions were then translated into the Malay language by one translator with expertise in English and then back into English by an independent translator unaware of the original questionnaire. After that, the two versions of the original language are reviewed to ensure the equivalent between the original and translated versions.

Step 3 – Content validity

Content validity is typically evaluated by seven or more experts in the relevant domains (DeVon et al., 2007). Thus, eight experts with at least ten years of experience in the relevant field (physical activity, nutrition, psychometrics, and psychology) reviewed the items to ensure content validity. For the expert's reference, the researcher has generated eight items using the Likert scale (1-extremely inappropriate to 5-very acceptable). The experts will examine and refine the items. The content validity score was obtained using the following formula proposed by Noah and Ahmad (2005) as below:

$$\frac{\text{Total Score from Experts (x)}}{\text{Maximum score (100)}} \text{ X 100\% = Content Validity Achievement (1)}$$

Step 4 – Instrument validation and reliability

Exploratory factor analysis (EFA) will be used to determine the validity of the items and Cronbach's alpha for reliability. Three hundred samples were utilized for EFA and 60 respondents for reliability. A few schools were selected for the study, which included SMK Gombak Setia, SMK Bangsar, SMK Kelana Jaya, and SMK Seri Andalas. Exploratory factor analysis was used in this study to reduce a set of observed variables or items to a smaller group of variables that reflects the interrelationships among the observed variables. Therefore, researchers used EFA to determine whether the items correlate and identify weak items on the Malay version of the Adolescent Healthy Lifestyle Questionnaire. Johnson and Wichern (2007) explained EFA is a data reduction technique used to reduce many variables to a small set of underlying factors that summarize the essential information contained in the variables.

A Kaiser-Meyer-Olkin (KMO) test and Bartlett's Test of Sphericity were first conducted to verify if the data set was suitable for factor analysis. According to Di Iorio (2005), KMO and Bartlett's Test of Sphericity is for sample adequacy or whether data could factor well (Hair et al., 2010; Pallant, 2013). Tabachnick and Fidell (2007) suggested that the value of KMO should be greater than 0.6, and the value of Bartlett's Test of Sphericity (BTS) must be significant at $\alpha < .05$ to ensure that the sampling was adequate to proceed with factor analysis. Besides, principal components analysis (PCA) is a type of EFA procedure with the purpose of data reduction method. A large set of items is reduced to a smaller group of factors (Di Iorio, 2005). The value of eigenvalues was obtained to estimate the number of factors. The eigenvalue represents the amount of variance for which each factor accounts. Each factor may explain more or less than the amount of variance in a standardized variable which is 1.0. The values of some factors will be greater than 1.0, and those of other factors will be less than 1.0. The Scree Plot method was also used to validate the eigenvalue analysis results (Johnson & Wichern, 2007). This technique allows researchers to retain only those factors on the vertical slope and ignore those that form the scree plot. Preacher and MacCallum (2003) stressed that researchers should keep those factors above the point when the line changes to a gradual descent.

The factor loading value for each item was another indicator used to examine the factors retrieved by the factor analysis to ensure they were reliable. According to Field (2013), the most recommended factor loading for each item must exceed 0.3, and any item loading value less than 0.3 must be eliminated from the analysis. Meanwhile, Hair et al. (1998) recommended the practical significance where ± 0.3 is minimal, ± 0.4 is more critical, and ± 0.5 is practically significant for factor loading. However, some authors favor selecting items with factor loadings of 0.3 (Field, 2013) or 0.4 or higher (Pett et al., 2003). Di Iorio (2005) furthermore stated that items with loadings of less than 0.3 do not share a significant variance with the factor and may be considered for elimination. Thus, researchers must consider the relevant factor loading above 0.3 to select the item the observable measures construct to ensure the data gathered is useful.

Testing for reliability is vital because it relates to the consistency of an instrument (Huck, 20087). Reliability implies that the instrument consistently represents the construct being measured by yielding the same score when administered over time or across multiple administrations. According to Bruton et al. (2000), the consistency of scores across time requires that all other elements being equal. Internal consistency relates to how research instruments can provide a consistent result when applied at different times. The Cronbach's alpha coefficient is the most used metric of internal consistency. One advantage of using

coefficient alpha is that the result is simple and easy to understand. The degree coefficient alpha approaches 1.0, showing that the scale has better internal consistency. A low Cronbach's alpha value will impact the data's validity. This condition can occur when the number of items is insufficient or somewhat connected to each other. There are a few suggestions by scholars on the coefficient alpha. For the pilot study, the reliability result should be equal to or above 0.60 (Hinton et al., 2004). Straub et al. (2004) suggested four cut-off points for reliability, which include excellent reliability (0.90 and above), high reliability (0.70–0.90), moderate reliability (0.50–0.70), and low reliability (0.50 and below). It seems that many researchers follow the rule of thumb that coefficient alpha at 0.70 for an instrument is considered to have an acceptable level of consistency.

Sample size

The Malay version of the Adolescent Healthy Lifestyle Questionnaire was distributed to 300 children in Klang Valley. Previous researchers have made a few recommendations concerning the sample size for EFA. According to Gorsuch (1983) and Kline (1994), at least 100 participants are needed. Moreover, according to Jung and Lee (2011), a sample size of at least 200 will achieve reliable and valuable results. Sixty respondents from secondary school students in Klang Valley were involved in the reliability analysis.

Ethics approval and informed consent

This research was conducted with the approval of the related ethical community and the consent of every respondent's parents. The approval was provided by UiTM Research Ethics Committee (REC) with reference number: REC/03/2022 (ST/MR/29). Informed consent was obtained from all participants included in this study.

Data analysis

Exploratory factor analysis was used to determine the scale's factor structure. Meanwhile, a reliability test was conducted to show the questionnaire's reliability. However, the normality test will be conducted before EFA and reliability analysis to ensure the data were distributed normally. According to the findings of the normality test, all the data was normally distributed where the skewness and kurtosis are less than .3 and .10. Meanwhile, the quantitative data gathered via the questionnaires will be analyzed using SPSS version 25.

Results

The respondents' age percentages are shown in Table 1. The distribution of sex among the respondents was boys (59.1%) and girls (40.9%). Meanwhile, 57.9% represent Malay ethnic, Chinese 20.4%, Indians 17.1%, and others, 4.6%. In term of age distribution, 13 (52.6%), 14 (16.4%). 15 (17.8%), 16 (7.2%), and 17 (5.9%). As Table 1 shows, in general, the majority of the respondents are of Malay ethnicity, age 13, and boy.

Table 1. Characteristic of the Respondents (n = 300)

Age	Percentage	Race	Percentage	Gender	Percentage
13	52.6	Malay	57.9	Boy	59.1
14	16.4	Chinese	20.4		
15	17.8	Indian	17.1		
16	7.2	Others	4.6	Girl	40.9
17	5.9				

Normality

The normality in distribution was tested by examining skewness and kurtosis before conducting an exploratory factor analysis. The normal distribution is a fundamental assumption for statistical analysis and the structural equation model (Hair et al., 2010). According to Hair et al. (2010), normality refers to the shape of the data distribution for individual metric variables and its correspondence to the normal distribution of the benchmark for statistical methods. To check the normality, this study applied the statistical method of Skewness and Kurtosis (Hair et al., 2010; Kline, 2015; Tabachnick & Fidell, 2013). Hence, it was suggested that the absolute value of Skewness and Kurtosis should not be greater than 3 and 10, and data was normality distributed according to the skewness and kurtosis.

Content Validity

Table 2 shows the responses of eight experts on questionnaire items. Experts reviewed the eight items regarding healthy lifestyle constructs, instrument format, item writing techniques, and language, including grammar and sentences, that were suitable to the population's cognitive ability. After researchers made amendments according to suggestions by experts, the items were found to be clear and appropriate for the respondents.

Table 2: Content Validity according to Percentage of Eight Experts

Expert/Score	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Score
Expert 1	3	4	4	3	3	4	4	5	.75
Expert 2	4	4	4	4	4	4	4	4	.80
Expert 3	5	5	5	5	3	4	5	5	.92
Expert 4	4	4	4	4	3	5	4	5	.82
Expert 5	3	3	4	4	3	4	4	5	.75
Expert 6	4	3	5	4	4	4	5	5	.85
Expert 7	4	4	4	4	4	3	5	5	.82
Expert 8	4	3	4	5	3	4	4	4	.77
	r =								.81

According to Table 2, obtaining content validity at r =.81 is considered good. Noah and Ahmad (2005) defined good content validity as a percentage of content validity achievement greater than .70.

Exploratory Factor Analysis (EFA)

Exploratory factor analysis (EFA) was performed on 104 items using principal component analysis extraction and varimax rotation. In this study, the minimum factor loading cut-off value was 0.3. (Comrey & Lee, 1992; Di Iorio (2005); Field 2013). Ten factors had eigenvalues greater than one. As shown in Table 3, the ten factors explained 55.605% of the variance. Likewise, the explained variance for the first component was 17.236%, 29.187% for the second, 34.630% for the third, 39.004% for the fourth, 42.639% for the fifth, 45.701% for the sixth, 48.612% for the seventh, 51.005% for the eighth, 53.335% for the ninth, and 55.605% for the tenth component.

Table 4 shows the factors where all the factor loadings for each factor are greater than 0.3. The first component, suicidal tendencies, has eleven items with factor loading ranging from -.762 to .852. The second indicated component is mental health. This component has 16 items with factor loadings from .474 to .704. The third criterion is environmental health, with six items and a factor loading ranging from .503 to .715. Moreover, the fourth criterion is an interpersonal relationship, and the factor loading for the three items in this criterion ranged from -.615 to -.728. Furthermore, the fifth criterion was identified as substance abuse, including six items and the factor loading ranging from .697 to .843. Next, the factor loading for the sixth factor ranged from .394 to .819, with five items identified as a healthy diet.

The following domain is known as accident prevention. There are five items for accident prevention, with factor loadings ranging from .461 to .709. Besides that, the eighth component, sleep quality, included three items, and the factor loading ranged from .605 to .704. Furthermore, five items indicated physical activity for the ninth domain, and the factor loading ranged from .372 to .617. Lastly, the tenth component is social health, while the number of items is four, and the factor loadings range from .413 to .551. Lastly, the tenth component is social health, while the number of items is four, and the factor loadings range from .413 to .551. According to Hair et al. (2010), at least three items per construct provide minimum coverage of the constructs. Consequently, the researchers deleted forty items with factor loading below 0.3. Therefore, sixty-four items with ten constructs were used to assess the healthy lifestyle among adolescents.

Table 3: Total Variance Explained

	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	**Total**	**Percent of Variance**	**Cumulative Percent**	**Total**	**Percent of Variance**	**Cumulative Percent**
1	17.926	17.236	17.236	9.434	9.072	9.072
2	12.429	11.951	29.187	9.230	8.875	17.947
3	5.661	5.443	34.630	8.838	8.498	26.445
4	4.549	4.374	39.004	6.703	6.445	32.890
5	3.780	3.635	42.639	4.739	4.556	37.446
6	3.185	3.062	45.701	4.508	4.334	41.781
7	3.028	2.911	48.612	4.065	3.909	45.689
8	2.488	2.393	51.005	3.574	3.436	49.126
9	2.423	2.330	53.335	3.147	3.026	52.152
10	2.360	2.270	55.605	2.989	2.874	55.605

Table 4: The Items and Final Components of the Malay Version of the Adolescent Healthy Lifestyle Questionnaire

		Components									
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Suicidal Tendencies											
1	Saya pernah melakukan percubaan untuk menamatkan hidup saya tetapi menghentikannya apabila teringat tentang sesuatu (orang tersayang, dosa dll) *[I have tried to end my life but ceased to do so when I am reminded of something (loved ones, sins etc.)]*	.852									
2	Saya pernah mencuba menamatkan hidup saya tetapi sebenarnya saya tidak berkeinginan untuk mati *[I have attempted to end my life, but I actually did not want to die].*	.839									
3	Saya pernah mencederakan diri sendiri dengan tujuan untuk menamatkan hidup saya *[I have hurt myself for the purpose of ending my life].*	.823									
4	Saya pernah mencuba untuk menamatkan hidup ini tetapi tidak berhasil. *[I have tried to end my life, but it did not work].*	.815									
5	Saya pernah terfikir untuk menamatkan hidup saya [*I have once thought about ending my life].*	.802									
6	Saya merasakan tidak ada sebab untuk saya terus hidup *[I feel like there is no reason for me to live].*	.794									
7	Terlintas dalam fikiran saya untuk menamatkan hidup saya namun saya takut untuk melakukannya [*It has crossed my mind to end my life, but I am afraid to do so].*	.791									
8	Terlintas dalam fikiran saya untuk menamatkan hidup ini apabila berhadapan dengan masalah yang besar [*It has crossed my mind to end my life when I am faced with a big problem].*	.791									
9	Saya pernah menggunakan kaedah tertentu untuk menamatkan hidup saya. *[I have tried certain methods to end my life].*	.789									
10	Terlintas dalam fikiran saya untuk menamatkan hidup ini apabila berhadapan dengan masalah yang besar [*It has crossed my mind to end my life when I am faced with a big problem].*	.776									
11	Saya tidak ada keinginan untuk meneruskan kehidupan ini [*I have no will to continue my life].*	-.762									
Mental Health											
12	Saya disayangi oleh orang lain *[I am loved by others].*		.704								

		Components									
		1	2	3	4	5	6	7	8	9	10
13	Saya amat rapat dengan orang lain *[I am very close to others].*		.676								
14	Saya begitu bermanfaat kepada orang lain *[I am beneficial to others].*		.673								
15	Saya berminat dengan perkara baru *[I am interested in new things].*		.665								
16	Guru-guru mempercayai saya boleh berjaya *[Teachers believe that I can be successful].*		.659								
17	Saya ceria pada setiap masa *[I am cheerful at all times].*		.640								
18	Saya boleh membuat keputusan sendiri berkaitan sesuatu perkara *[I can make my own decision on certain things].*		.620								
19	Saya berasa tenang sepanjang masa *[I feel calm at all times].*		.599								
20	Rakan sebaya membantu saya apabila menghadapi masalah *[My peers help me when I have problems].*		.593								
21	Saya dapat berfikir dengan waras *[I can think rationally].*		.572								
22	Saya dapat menangani masalah dengan baik *[I am good at problem handling].*		.564								
23	Saya menaruh harapan yang tinggi terhadap masa depan *[I have high hopes for the future].*		.553								
24	Guru-guru mendengar apa yang saya luahkan *[Teachers listen to things that I say].*		.546								
25	Saya meluahkan masalah kepada rakan sebaya *[I share problems with my peers].*		.531								
26	Keluarga saya membantu saya apabila menghadapi masalah *[My family helps me when I have problems].*		.493								
27	Saya mempunyai minat terhadap orang lain *[I have interest in other people].*		.474								
Environmental Health											
28	Saya sering menyertai aktiviti berkaitan dengan alam sekitar *[I often join activities related to the environment].*			.715							
29	Saya sering menghadiri program dan seminar kesedaran alam sekitar *[I often attend environmental awareness programs and seminars].*			.663							
30	Saya menggunakan beg kertas berbanding beg plastik *[I use paper bags instead of plastic bags].*			.547							
31	Saya melupuskan bateri lama dengan selamat *[I dispose of used batteries safely].*			.523							
32	Saya berjalan kaki/berbasikal apabila ke sekolah *[I walk/bike when I go to school].*			.518							

		Components									
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
33	Saya menggunakan semula kertas yang terpakai *[I reused the recycled papers].*			.503							
Interpersonal relationship											
34	Saya tidak bersetuju dengan guru-guru dalam banyak perkara *[I disagree with my teachers on many things].*				-.728						
35	Saya tidak bersetuju dengan rakan-rakan dalam banyak perkara *[I disagree with my friends on many things].*				-.652						
36	Saya tidak bersetuju dengan ibubapa dalam banyak perkara *[I disagree with my parents on many things].*				-.615						
Substance Abuse											
37	Penggunaan dadah mendatangkan kesan buruk kepada saya *[Drug use had a detrimental effect on me].*					.843					
38	Minum minuman memabukkan mendatangkan kesan buruk kepada saya *[Drinking intoxicating drinks has a bad effect on me].*					.829					
39	Saya percaya mereka yang terjebak dengan dadah bermula dengan tabiat merokok *[I believe those who get stuck with drugs start with the habit of smoking].*					.825					
40	Merokok mendatangkan kesan buruk kepada saya *[Smoking has a bad effect on me].*					.718					
41	Saya menjauhi aktiviti merokok kerana ia merupakan salah satu punca masalah sosial *[I stay away from smoking because it is one of the causes of social problems].*					.699					
42	Saya tidak pernah minum minuman memabukkan *[I have never drank alcoholic beverages].*					.697					
Healthy Diet											
43	Saya mengurangkan pengambilan minuman yang manis *[I reduce the intake of sugar-sweetened beverages].*						.819				
44	Saya mengurangkan pengambilan minuman berkarbonat *[I reduce the intake of carbonated drinks].*						.694				
45	Saya menghadkan pengambilan makanan ringan *[I limit the intake of junk food].*						.623				

		Components									
		1	2	3	4	5	6	7	8	9	10
46	Saya menghadkan pengambilan makanan tinggi lemak *[I limit the intake of food high in fats].*						.577				
47	Saya mengurangkan pengambilan makanan bergoreng *[I reduce my intake of fried foods intake].*						.394				
Accident Preventive											
48	Saya memakai tali pinggang keledar apabila menaiki kereta *[I wear a seat belt when riding a car].*							.709			
49	Saya memakai topi keledar apabila menunggang motosikal *[I wear a helmet when riding a motorcycle].*							.674			
50	Saya mematuhi peraturan sewaktu berada di jalan raya *[I follow rules while on the road].*							.652			
51	Saya menggunakan alat pelindung diri yang perlu sewaktu melakukan aktiviti fizikal *[I use necessary self-protective equipment while doing physical activities].*							.569			
52	Saya memakai topi keledar apabila menunggang basikal *[I wear a helmet when riding a bicycle].*							.461			
Sleep Quality											
53	Saya mengalami kesukaran untuk tidur *[I have difficulty sleeping].*								.704		
54	Saya sering terjaga semasa tidur *[I am often jerked awake during sleep].*								.628		
55	Saya sukar melelapkan mata apabila terjaga pada waktu malam *[I find it difficult to sleep after being jerked awake at night].*								.605		
Physical Activity											
56	Saya melakukan aktiviti fizikal ketika kelas Pendidikan Jasmani di sekolah *[I do physical activities during Physical Education classes at school].*									.617	
57	Saya aktif melibatkan diri dalam aktiviti sukan di sekolah *[I am actively involved in sports activities at school].*									.557	
58	Saya sering melakukan activiti riadah pada masa lapang *[I often do leisure activities in my free time].*									.477	
59	Saya menjadikan aktiviti fizikal sebahagian daripada gaya hidup *[Physical activity is part of my lifestyle].*									.426	
60	Saya bersenam (jogging/bermain bola sepak/berbasikal/berenang/bola jaring/bola keranjang) dengan aktif 30 minit sehari sekurang-kurangnya 3									.372	

		Components									
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	kali seminggu *[I exercise (jogging, playing soccer, cycling, swimming, netball, basketball) actively 30 minutes a day at least 3 times a week].*										
Social Health											
61	Rakan sebaya mengambil berat tentang saya *[My peers care about me].*										.551
62	Saya seronok menghabiskan masa bersama rakan *[I have fun spending time with friends].*										.501
63	Rakan sebaya membantu saya apabila menghadapi masalah *[My peers help me when I have problems].*										.476
64	Saya meluahkan masalah kepada rakan sebaya *[I share problems with my peers].*										.413

Reliability

The questionnaire's consistency is assessed by its reliability. The data is considered reliable if consistent results have been obtained in identical settings but under different situations. As a result, Cronbach's alpha was used to assess the questionnaire's reliability. The measurement of internal consistency for this instrument used in this study is excellent as Cronbach's Alpha value for each measurement ranges from .708 to .906.

Discussion

The Malay version of the Adolescent Healthy Lifestyle Questionnaire has shown ten major dimensions in assessing the practice of a healthy lifestyle among teenagers in Malaysia. Suicidal tendencies, mental health, environmental health, interpersonal relationships, substance abuse, healthy eating habits, accident prevention, sleep quality, physical activity, and social health are ten constructs. However, all the items related to health responsibility were removed from this questionnaire due to low factor loadings of less than 0.3.

The current study used prior literature and detailed reviews on healthy lifestyles among adolescents to develop a new instrument to measure healthy lifestyles in a population context. Previous research on healthy lifestyles only focused on a few constructs that might not represent all the healthy lifestyle components among adolescents. A study by Chu-Ko et al. (2021) focused on eight components, exercise, nutrition, self-actualization, interpersonal support, health responsibility, stress management, and health literacy, to assess the healthy lifestyle for adolescents. Maniaci et al. (2021) considered diet, stress, internet use, body mass index, perceived social support, and self-esteem as instruments to measure the impact of a healthy lifestyle on academic achievement among adolescents.

Previous research in Malaysia assessed a healthy lifestyle among undergraduate students employed a self-administered pro forma checklist which includes a few constructs such as physical activity, smoking, alcohol consumption, and anthropometric status. The study was conducted to determine the lifestyle and behavioral risk factors (Chen & Ismail, 2018).

A study to evaluate the quality of life among undergraduate students in Sarawak has used the World Health Organization Quality of Life-BREF (WHOQOL-Bref) instrument, which contains four major domains, physical, psychological, social relationships, and environment (Cheah et al., 2021). Besides that, the previous studies in Malaysia also focused on a few variables to assess a healthy lifestyle and its impact on academic performance, mental health, obesity, and others. A study by Sabramani et al. (2015) on obesity used ethics, gender, socioeconomic, emotion, environment, dietary trends, and medical illness variables. Meanwhile, Caracuel et al. (2020) measured the constructs of physical activity and sport, healthy diet, sedentary lifestyle, substance abuse, and engagement in physical education classes to identify students' behaviors in improving their health.

The scholars developed a few questionnaires that focused only on several constructs to assess a healthy lifestyle based on the literature review. Consequently, the information acquired may not adequately reflect the definition of a healthy lifestyle that has a broader concept. All instruments should be able to measure the construction they claim to be able to measure. Otherwise, instruments that do not address the construct's definition and characteristics may not be applicable, and the data collected may be meaningless. As a result, considering various

components included in the questionnaire, this instrument helps assess the healthy lifestyle of adolescents in Klang Valley, Malaysia. This instrument also benefits other related parties, such as schools, the Ministry of Education, and parents, by providing a clear view of healthy lifestyle behaviors among school adolescents. As a result, any conclusion or intervention will be based on valid and reliable data. Any effective intervention should be focused on critical issues in the population. The point is, what are the essential variables or factors that influence health outcomes? This is a vital question to consider before implementing any intervention. Therefore, various constructs of a healthy lifestyle must be included in the instrument in order to assess the most critical construct of a healthy lifestyle that contributes to a healthy lifestyle or any health issues.

Another important thing related to the validity and reliability of the questionnaire is the language used. According to the Model of the Cognitive Processes Involved in Responding to a Survey Item, respondents must clarify the item, reacquire important information from memory, form a tentative decision, convert the tentative decision into one of the response options provided, and then edit their response as needed (Sudman et al., 2010). Therefore, ensuring that all respondents fully understand each item's statement is critical. As a result, the language used must be the population's primary language. Failure to comprehend the language used in the questionnaire will result in meaningless data. Thus, the Malay version of the Adolescent Healthy Lifestyle Questionnaire is valuable for Klang Valley's adolescent population because Malay is the national language taught in Malaysia's schools.

Furthermore, a valid and reliable questionnaire can be used by related parties to better understand healthy lifestyles among adolescents in schools, especially during the pandemic of COVID-19. Lifestyle changes due to restricted movement order might influence adolescents' practices of a healthy lifestyle. Thus, teachers, schools, parents, the Ministry of Education, and other related parties must use valid and reliable data for tailored interventions to maintain a healthy lifestyle in the young population. Among the strengths of this study were the translation and adaptation process, where all important steps were considered to ensure the equivalent of the items with the existing questionnaire. Although there are a few methodologies for translation and adaptation, the methods used for the present study were adequate to yield the validity and reliability of the instrument. Besides, using the Malay language for this instrument would enhance the response rate from the respondents, the validity, and the generalization of the healthy lifestyle study. Moreover, using a large sample size with simple random sampling helped to enhance the results in terms of validity and generalization for a healthy lifestyle study.

Conclusion

The results suggest that the Malay version of the Adolescent Healthy Lifestyle Questionnaire is a valid and reliable questionnaire that can be used for studies related to a healthy lifestyle.

The Malay version of the Adolescent Healthy Lifestyle Questionnaire is relevant and focused on the pandemic of COVID-19. Still, it can be used post-COVID-19 in considering the practices of a healthy lifestyle that are valuable for each induvial to achieve good health and well-being. In fact, Sustainability Development Goal 3 focuses on good health and well-being and aims at the practice of a healthy lifestyle and well-being at all ages with the prevention of non-communicable diseases and premature death. Consequently, the effectiveness of prevention, promotion, and campaign related to a healthy lifestyle should rely on meaningful and

valuable data to ensure the main problem associated with a healthy lifestyle can be addressed. Considering the validity and reliability of this instrument, as well as the Malay language, makes this questionnaire more accurate and simpler to administer, specifically in Malaysia's adolescent population.

Nevertheless, the present study has its limitations. The first limitation related to the study's methodology, where EFA was used to assess the instrument's validity. The EFA is not appropriate to test the theoretical foundation of the instrument. Hence, this study suggests Confirmatory Factor Analysis as a methodology for future research to enhance the construct validity evidence for the Malay version of the Adolescent Healthy Lifestyle Questionnaire. The generalizability of the study was also subjected to limitations related to its findings. The present study only involved adolescents in schools in Klang Valley. Based on generalizability limitations, this study also suggests that future studies should be conducted in all states in Malaysia to depict a healthy lifestyle among the adolescent population.

Funding

This research has been funded by the Ministry of Higher Education under grant number FRGS RACER/1/2019/SS06/UITM//1

Acknowledgments

This research was supported by the Ministry of Higher Education. We thank our colleagues from the Faculty of Education, Universiti Teknologi MARA. They provided insight and expertise that greatly assisted the research, although they may not agree with all the interpretations/conclusions of this paper.

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