



## MALAYSIAN TRANSLATION AND PSYCHOMETRIC EVALUATION FOR PARENT AND CHILD QUESTIONNAIRES OF CHILDREN HEALTH SURVEY FOR ASTHMA

Maryam SE Hussein<sup>1†</sup> --- Waqas Akram<sup>2</sup> --- Nor Azizah Abu<sup>3</sup> --- Nahlah Elkuodssiah binti Ismail<sup>4</sup>

<sup>1,2,3</sup>Clinical Pharmaceutics Research Group (CPRG), Faculty of Pharmacy, Universiti Teknologi MARA, Puncak Alam Campus, Bandar Puncak Alam, Selangor, Malaysia

<sup>4</sup>Faculty of Medicine, Universiti Teknologi MARA, Selayang Campus, Batu Caves, Selangor, Malaysia

### ABSTRACT

*This study aims to evaluate the reliability, and construct validity of the Malaysian versions of parent and child report of Children Health survey for Asthma. Questionnaires were translated to Bahasa Malaysia using previously established guidelines, a cross sectional study design and methodology was used to obtain the data, the study was recruited 180 respondents (7-16 years old) who have been diagnosed as asthmatic and their parents, SPSS version 20 was used to determine the reliability and construct validity. The results showed that all scores of cronbach's alpha in the acceptable range  $\geq 0.7$ . Both reliability and factor analyses reveal an acceptable reliability and a good construct validity of the scales.*

**Keywords:** CHSA, CHSA-C, Reliability, Validity, Asthmatic children, Parents.

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### Contribution/ Originality

This study documents the reliability and validity of the two version of CHSA. Both two instruments were translated to other language (Bahasa Malaysia) and evaluated their reliability and validity hence will help researchers from the same country to use these translated instruments in their studies. This current research dealt with asthmatic children and their parents to identify their point of views about the effect of asthma in their lives. In order of that, the findings from this research will contribute to knowledge and awareness among health practitioners and asthmatic patients and their family members that disease-related QoL also affects the successfulness of asthma management, not forgetting academia in filling the gaps in the literatures.

† Corresponding author

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## 1. INTRODUCTION

Asthma is one significant health problem that results in high morbidity and mortality. In general, there are about 300 million persons affected by asthma around the world [Global Initiative for Asthma \[1\]](#). There are many studies that indicate that the prevalence of asthma is increasing with time in the Asia Pacific region. Prevalence of childhood asthma in Taiwan increased from 1.3% in 1974 to 5.07% in 1985. Also in Singapore, the prevalence of asthma increased from 13.7% in 1987 to 20.7% in 1996 [\[2\]](#). Furthermore, the prevalence of asthma increases with increased urbanization. According to the Global Burden of Asthma by Global Initiative for Asthma (GINA), in 2025, the prevalence of asthmatic patients will increase by an additional 100 million individuals. In Malaysia, in 2004, the prevalence of asthma was about 4.8% [\[3\]](#). A cross-sectional study that was conducted among 7-12 year old school children in Kuala Lumpur in 1990 reported about 8.7% of primary school students were asthmatic [\[4\]](#). Another study was conducted in 1995 and demonstrated the prevalence of 13-14 year old and 6-7 year old asthmatic children was 13.9% and 11%, respectively [DeBruyne, et al. \[5\]](#). [Quah, et al. \[6\]](#) conducted studies to determine the differences in prevalence rate of asthma symptoms, eczema and allergic rhinitis in Kota Bharu between 1995 and 2001 among school children. They found that the ever wheeze percentage in primary school children between 1995 and 2001 was 8.3% and 6.9%, and for secondary school children the ever wheeze percentage was 10.7% and 12%, respectively [\[6\]](#). However, according to the Ministry of Health Second National Health and Morbidity Survey, the prevalence of asthma among adults was lower at 4.1% [\[7\]](#). Childhood asthma is a serious health problem that results in impairment of physical and social life of the affected children and their immediate families [\[8, 9\]](#). In other words; the quality of life of asthmatic children can be severely affected due to disease symptoms and dependence on medication. As a result, health-related quality of life (HRQOL) instruments in children has advanced significantly in recent years and many of generic and disease-specific HRQOL instruments are now available for pediatric populations. These instruments are useful in the evaluation of health interventions and in controlling children's health [\[10\]](#). Because of the increasing internationalization of clinical trials, the need to translate and adapt HRQOL instruments for use in countries other than that of the source language has grown rapidly and continues to develop with the increasing involvement of new countries such as Malaysia in clinical trials. Most instruments are developed in English-speaking countries, and therefore, need to be translated and adapted for use in other countries [\[11\]](#). Children health survey for asthma has two versions one for the parent (CHSA) and the other for the children themselves (CHSA-C). Because of the wide use of these instruments as a health related quality of life tools, we were interested in translating both versions of Children Health Survey for Asthma (CHSA & CHSA-C) and documenting some of their psychometric properties in Malaysian people.

## 2. METHODS

### 2.1. Instruments Translation

The English version of CHSA: 48 is a questionnaire administered by parents of children 5 to 12 years of age with chronic asthma. The instrument has items divided into five scales 15 items for physical health, 5 items for child's activity, 6 items for family's activity, 5 items for child's emotional health, and 17 items for family's emotional health, as well as questions about health care utilization, asthma triggers, and family demographics. All scale items require subjects to respond on a 5-point Likert-type scale, with higher scores indicating better or more positive outcomes [12]. The English version of CHSA-C composed of 21 demographic and asthma history questions and 25 items computed in 3 scales: 7 items of physical health, 6 items of activities, and 12 items of emotional health. Children are asked to think about the past 2 weeks; all scale item responses use a 5-point Likert scale, higher scale scores indicate more-positive perceived health status [13]. After obtaining permission from the American Academy of Pediatrics and authors of both versions of the CHSA, both questionnaires were translated to Bahasa Malaysia according to the international guidelines [14] as follows: the original questionnaires were translated from English to Bahasa Malaysia by bilingual persons (forward translation), the translated questionnaires were translated from Bahasa Malaysia to English language by other translators (backward translation), the objective of this step is to check that the translated version reflects the same item content as the original, this step provide the content validity from the judgmental committee and the experts and after that the final versions were distributed to some subjects who will not be part of the targeted sample. Each subject completed the questionnaire and asked if there is any difficult question. The results showed that two items in parent version from 48 items were not suitable for respondents' understanding. So, the researchers decide to take several actions, including meeting between researchers and consultation with expert translator. These actions help them to solve these obstacles and choose the most suitable expressions for the confusing items. The final versions were ready to be distributed to asthmatic children and their parents.

### 2.2. Participant and Procedure

This study was conducted at both UiTM and MOH paediatric and respiratory specialist clinics in Selayang and Sungai Buloh After getting ethical approval from National Institute of Health (NIH). The study recruited 180 pairs of asthmatic children and their parents, the age of the children were from 7 to 16 years old who have been diagnosed as asthmatic. Only participants who were able to understand the Malay Language were included. The questionnaires were self-administered for the parents and for the children over than 10 years old, children below 10 years old were interviewed. Descriptive statistics were used to describe demographic for asthmatic children and their parents, and disease characteristics of the asthmatic children. In the present study, internal consistency reliability was determined using Cronbach's alpha, which can range in value from "0" indicating low reliability to "1.0" indicating high reliability. Cronbach's alpha was

used to determine if the items on the two translated questionnaires were internally consistent. In addition, intraclass correlation (ICC) was used to determine the test-retest reliability for both translated version of CHSA and CHSA-C that were administered at one month time interval to about 20% of the respondents. ICC is a statistical method that has been used to measure the agreement between assessors, rather than between two methods, and it has also been used to measure the correlation between pairs of observations that do not have obvious order [15]. A class of variables refers to metric (scale) and the variance of variables. When researchers are interested in the relationship among variables of a common class, they can look for the ICC [16]. The following guidelines in ICC were used for interpretation of the level of similarity or agreement: 0.81-1.00 is excellent agreement; 0.61-0.80 is good agreement; 0.41-0.60 is moderate agreement;  $\leq 0.40$  is poor to fair agreement [17]. On the other hand, construct validity was determined by factor analysis. Factor analysis shows good construct validity for the scale if the factors support the design of the questionnaire and items in each domain are correlated with items in the same domain, but they are not correlated with items in the other domain. Data were analyzed using the Statistical Package for Social Science (SPSS) version 20.

### 3. RESULTS

#### 3.1. Demographic Data

A total of 180 pairs of asthmatic children and their parents completed the questionnaires. As shown in table (1) child ranged in age from 7 to 15 years old with mean= 9.9 years old, and the majority in race were Malay by 87.2% and 11% were Indian, 7.8% reporting an annual household income less than 1500 RM, 32.8% of the parents were have university diploma, and 59.4% of the caregivers were mothers of the children, 52.2% of the children have been hospitalized for asthma, and only 7.8% of the children stopped breathing or was intubated because of asthma.

Table-1. Sample Demographic Features (n=180)

Children		n (%)	Parents		n (%)
Gender	Male	105 (58.4)	Gender	Male	73 (40.6)
	Female	75 (41.6)		Female	107 (59.4)
Age (years old)			Age (years old)		
Mean ( $\pm$ SD)	9.9 (2.2)		Mean ( $\pm$ SD)	39 (5.1)	
	Min: 7;			Min: 28 ; Max : 53	
	Max: 15				
Ethnicity	Malay	157 (87.2)	Education	Primary school	1 (0.6)
	Indian	11 (6.1)		Secondary school	10 (5.6)
	Chinese	7 (3.9)		SRP/PMR	
	Other	5(2.8)		Secondary school	37 (20.5)
Child stopped breathing or was intubated because of asthma		14 (7.8)	SPM		
			Technical/vocational school	21 (11.7)	
Child ever used steroids 4 times in a 6-month period			University diploma	59 (32.8)	
			Bachelor (degree)	22 (12.2)	
			Master	7 (3.8)	
			PhD	1(0.6)	
			Missing	22 (12.2)	
		21 (11.7)			

Child ever been hospitalized for asthma		94 (52.2)	Monthly household income (RM)	Less than 1500	14 (7.8)
Child ever been taken to emergency room due to asthma		123 (68)		1501-3000	72 (40)
				3001-5000	60 (33.3)
				More than 5000	27 (15)
				Missing	7 (3.9)

### 3.2. Descriptive Statistics for Translated Version of CHSA and CHSA-C Domains

Computed scale scores are transformed as the following equation (scale = ((mean of all items-1)/4)\*100). Next, the mean, standard deviation, minimum, and maximum value were calculated for each domain by using SPSS software. So that possible scale scores range from 0-100. Higher scores indicate better or more positive outcomes.

**Table-2.** Descriptive Statistics for the translated version of CHSA-C Scales n=180

Domains	Mean	SD	Median	IQR	Minimum	Maximum
Child's Physical health	74.4	17.3	76.7	24.1	0	100
Child's Activities	81.7	21.7	91.6	32.2	0	100
Child's Emotional health	79.8	16.3	83.3	22.9	25	100

Basic descriptive data about the three scales of translated version of CHSA-C is presented in Table 2. Computed scores were transformed giving a range from 0-100. Higher scores indicate better health status. Overall, the highest score in the activity domain by 81.7 (range: 0-100; *SD*: 21.7), then comes emotional health domain by 79.8 (range: 25.00-100.00; *SD*: 16.3). Finally, the lowest score is physical health by 74.4 (range: 0-100; *SD*: 17.3).

**Table-3.** Descriptive Statistics for the translated version of CHSA

Domains	Mean	SD	Median	IQR	Minimum	Maximum
Child's Physical health	77.4	17.2	80.8	22.9	23.3	100
Child's Activities	82.5	20.6	90	25	0	100
Child's Emotional health	82.2	20.2	90	33.7	25	100
Family's Activities	88.6	13.2	91.6	16.7	37.5	100
Family's Emotional health	77.2	13.8	77.9	16.1	14.7	100

Overall, mean scores ranged from the low 77.2 to upper 88.6, the lowest score was reported in family's emotional health domain with standard deviation (13.8) and the highest score in family's activities domain with standard deviation (13.2) and 82.2-82.5 respectively for child's emotional health with standard deviation (20.2) and activities domain with standard deviation (20.6) see Table 3.

### 3.3. Reliability and Validity for Malaysian Versions of CHSA and CHSA-C Domains

Alpha coefficients and inter-item correlations were calculated. Cronbach's alpha ( $\alpha$ ), which can range in value from "0" indicating low reliability to "1.0" indicating high reliability, was used to determine if the items in both translated questionnaires were internally consistent. Furthermore, test-retest reliability was examined by using intraclass correlation (ICC) to measure the reliability between the measures at two different time periods. ICC interprets agreement based on five levels: 0 to 0.2 as poor, 0.3 to 0.4 as fair, 0.5 to 0.6 as moderate, 0.7 to 0.8 as strong, and > 0.8 almost perfect agreement [17].

Table 4 shows the results of alpha coefficients, inter-item correlations, ICC, and factor analysis for translated version of CHSA-C. It can be observed that the alpha coefficients of most applicable scales were greater than 0.8. It indicates that items within each scale measure the same general construct. Furthermore, inter-item correlations were good. For CHSA-C the factor analysis showed good construct validity for the scale. The three factors supported the design as three domains. Items in each domain were correlated with items in the same domain, but they were not correlated with items in the other domain. Also, Kaiser-Meyer-Olkin Measure of Sampling Adequacy was good (KMO = .828). If KMO value was 0.6 or higher statistic predicts that the data will have well factor analysis [18]. So factor analysis was good for this data. In another hand, for test-retest reliability, about 31 of asthmatic children were used to examine test-retest reliability. For each of the three scales correlation (ICC) ranged from a low of 0.54 to a high of 0.61. As we mentioned above from 0.5 to 0.6 consider moderate correlation.

Table 5 describes the results of alpha coefficients, inter-item correlations, ICC, and factor analysis for translated version of CHSA. It is noticed that the alpha coefficients of most applicable scales were greater than 0.8 except for family's activity domain where was with over all mean 0.77. But it is still considered reliable. In order of inter-item correlation, all the values were good. For factor analysis, it is clear to see that physical health, child's emotional health and child's activity domains supported the design of the scales. However, the other domains had some items relatively weaker but not a serious problem only when the factor loading below < 0.2 will be considered serious problem [19]. In addition, KMO = 0.821 and this indicated that data had well factor analysis. Finally, test-retest reliability for each of the five scales correlation (ICC) ranged from moderate correlation (0.59) to high correlation (0.82).

Table-4. Item Analysis of translated version of CHSA-C

Items <sup>1</sup>			It-T C. <sup>2</sup>	Cb's A. <sup>3</sup>	Loading on 3 Factors. <sup>4</sup>			T- retest <sup>5</sup>
					1	2	3	ICC
PH	PH1	have you had shortness of breath	.605	.837			.656	.536
	PH2	have you had tightness in the chest	.636	.832			.712	
	PH3	have you had wheezing without a cold	.639	.831			.716	
	PH4	have you had cough	.553	.844			.640	
	PH5	have you had a cold that won't	.599	.838			.720	

	PH6	go away have you had wheezing with a cold	.727	.818			.834	
	PH7	have you had difficulty sleeping	.579	.841			.679	
<b>CE</b>	CE1	frustrated about having asthma	.672	.868	.723			.610
	CE2	feel left out by other people because of asthma	.553	.875	.605			
	CE3	I am sad	.588	.873	.685			
	CE4	embarrassed about having to use an inhaler	.452	.880	.571			
	CE5	frustrated about having to use asthma treatments	.608	.873	.712			
	CE6	frustrated that I can't do some things due to asthma	.580	.874	.615			
	CE7	upset about having asthma	.661	.869	.729			
	CE8	upset by having to use asthma treatments	.569	.874	.652			
	CE9	My asthma causes stress in my family	.515	.878	.551			
	CE10	frustrated that other people don't understand what it is like to have asthma	.489	.880	.526			
	CE11	Sometimes I get angry and ask "why is this happening to me?"	.679	.867	.687			
	CE12	I know which medicines to take for my asthma	.666	.868	.675			
<b>CA</b>	CA1	asthma keep you from doing School gym classes	.750	.898		.786		.592
	CA2	asthma keep you from doing Sports or running outside	.796	.891		.846		
	CA3	asthma keep you from doing Playing at friends' houses	.774	.894		.816		
	CA4	asthma keep you from doing Things that use a lot of energy	.737	.900		.829		
	CA5	asthma keep you from doing Things that use some energy	.836	.885		.864		
	CA6	asthma keep you from doing Things that use a little energy	.642	.913		.655		

Table-5. Item Analysis of translated version of CHSA

Items <sup>1</sup>			It-TC. <sup>2</sup>	Cb's A. <sup>3</sup>	Loading on 5 Factors. <sup>4</sup>					T-retest <sup>5</sup>
					1	2	3	4	5	ICC
PH	PH1	have your child had shortness of breath	.692	.917	.699					.821
	PH2	have your child had tightness in the chest	.719	.916	.736					
	PH3	have your child had wheezing without a cold	.596	.920	.619					
	PH4	have your child had cough	.633	.919	.693					
	PH5	have your child had a cold that won't go away	.549	.922	.627					
	PH6	have your child had wheezing with a cold	.638	.919	.696					
	PH7	have your child had difficulty sleeping	.723	.916	.767					
	PH8	have your child have rapid heart rate because asthma medicines	.637	.919	.642					
	PH9	have your child have headache because asthma medicines	.634	.919	.654					
	PH10	have your child have upset stomach / vomiting because asthma medicines	.598	.920	.605					
	PH11	have your child have tightness in the chest because asthma medicines	.706	.917	.739					
	PH12	have your child have irritable or fussy because asthma medicines	.471	.924	.475					
	PH13	have your child have fatigue (tires easily) because asthma medicines	.727	.916	.700					
	PH14	have your child have difficulty paying attention because asthma medicines	.668	.918	.672					
		have your child have difficulty sleeping at night								



	PH15	because asthma medicines	.655	.918	.676					
CE	CE1	Your child is frustrated about having asthma	.752	.940			.723			.590
	CE2	Your child is frustrated having to rely on asthma treatments	.878	.917			.770			
	CE3	Your child is frustrated by having to limit activities because of asthma	.835	.925			.771			
	CE4	Your child is upset about having asthma	.873	.918			.779			
	CE5	Your child is upset by having to take asthma treatments	.843	.923			.727			
CA	CA1	asthma keep your child from doing School gym classes	.762	.834			.723			.812
	CA2	asthma keep your child from doing Sports or running outside	.775	.829			.768			
	CA3	asthma keep your child from doing Playing at friends' houses	.690	.856			.638			
	CA4	asthma keep your child from doing Things that use a lot of energy	.778	.831			.661			
	CA5	asthma keep your child from doing Things that use some energy	.537	.883			.530			
FA	FA1	We changed family plans or trips because of my child's asthma	.654	.701					.355	
	FA2	We cancelled social plans because of my child's asthma We avoided	.654	.702					.352	

	FA3	activities or places that might trigger an attack	.385	.791				.310	.674
	FA4	Lost sleep because my child's asthma	.523	.739				.425	
	FA5	Missed work or school because my child's asthma	.528	.742				.532	
	FA6	Normal routine was changed because my child's asthma	.458	.755				.605	
FE	FE1	were you bothered by making frequent trips to the doctor's office	.377	.858		.320			.603
	FE2	were you bothered by finding a babysitter who can handle my child's asthma	.277	.860		.301			
	FE3	were you bothered by getting my child to take asthma medicines	.437	.856		.337			
	FE4	were you bothered by having all the equipment for asthma at home	.403	.857		.318			
	FE5	were you bothered by keeping the house clean to avoid triggers	.413	.856		.320			
	FE6	My child's asthma has caused stress in my family	.601	.847		.574			
	FE7	I am frustrated that other people don't understand what it is like to have asthmatic child	.425	.857		.437			
	FE8	Sometimes I get angry "why is it happening to my child?"	.459	.854		.437			
	FE9	I have doubts that I am doing the right things in the treatment	.567	.849		.525			
	FE10	I am not confident that I can handle a severe attack for my child	.494	.852		.493			
		Sometimes I lose hope that my child will get better							
		I am concerned about side-effects of asthma							

		treatment for my child								
	FE11	I worry about the cost of my child's medical care	.521	.851		.519				
	FE12	I worry that my child is not getting good medical care	.415	.858		.596				
	FE13	I worry that asthma causes my child to be left out from playing	.621	.846		.719				
	FE14	The cost of medical care for my child's asthma causes stress in our family	.590	.847		.727				
	FE15	I am concerned about problems from asthma that my child currently has or may have in the future	.634	.845		.732				
	FE16		.610	.847		.688				
	FE17		.402	.859		.548				

<sup>1</sup>Abbreviated form of items, <sup>2</sup>It-T C= Item-Total Correlation, <sup>3</sup>Cb's A= Cronbach's Alpha, <sup>4</sup>Principal component data extraction with varimax factor rotation, and <sup>5</sup> test-retes Physical Health (PH), Child's Emotional Health (CE), Child's Activity (CA), Family's Activity (FA), and Family's Emotional Health (FE)

#### 4. DISCUSSION

In this study, we performed the translation and cross-cultural adaptation of CHSA and CHSA-C examined their psychometric reliability and construct validity by using a representative sample of asthmatic children and their parents. The original versions for CHSA were developed by American Academy of Pediatrics; CHSA is a reliable instrument to assess the impact of asthma and treatment on the lives of children and their caregivers. It is a self-report measure completed by parents of children with chronic asthma. The CHSA can be used alone or as a companion to the child-completed CHSA-C [12, 13]. Because of the questionnaire have two versions for the child and another for the parents that will help researchers to determine the agreement between asthmatic children's and parent's responses. This study was the first to systematically translate and validate the CHSA instruments into the Malaysian language. The translation procedure that we used is the standard one to be sure that the translated version is culturally adapted to populations with different culture and language to those for which the questionnaires were originally developed [14]. The questionnaires were adapted according Malaysian culture especially in the demographic part such as Ethnic groups, seasons in the years, and education and health insurance system. Because of the researchers have faced some patients they confused about some items, they decide to consult with expert translator to help them to solve these obstacles and choose the most suitable expressions for the confusing items. This study assessed the reliability and validity for the translation versions and produced questionnaires that are

conceptually equivalent to the original, easy to understand for the children and their parents, and good in terms of internal consistency, test-retest, and construct validity. The results showed that both translated version have high item-total correlations for the majority of items, Cronbach's Alpha levels are consistently high for each item of all scales where the Cronbach's Alpha for the translated parent version were about 0.92 for both child physical health and child emotional health domains and about 0.84 for child's activity. While the family's emotional health and family's activity were about 0.73 and 0.85 respectively. In another hand, Cronbach's Alpha for child Malaysian version were about 0.83, 0.87, and 0.89 for child's physical health, child's emotional health, and child's activity respectively. Therefore, both Malaysian versions of CHSA and CHSA-C were reported as internally consistent. Establishing the internal consistency of both of them suggests that they are appropriate tools to use to assess the effect of asthma on the asthmatic children and their parents in Malaysia. The findings from the present study were consistent with those of [Asmussen, et al. \[12\]](#) who conducted a study to estimate the validity and reliability of the original CHSA instruments; They found that the parent English version of CHSA had a strong internal consistency where the Cronbach's Alpha were about 0.91 for child's physical health,  $\alpha = 0.89$  for child's activity,  $\alpha = 0.85$  for family's activity,  $\alpha = 0.91$  for child's emotional health, and  $\alpha = 0.90$  for family's emotional health. [Radecki, et al. \[20\]](#) examined the reliability and validity of the child English version of CHSA, and found that the CHSA-C is reliable with Cronbach's Alpha was 0.72 for child's physical health,  $\alpha = 0.8$  for child's activity, and  $\alpha = 0.85$  for child's emotional health. Both findings of the previous mentioned studies indicated that English versions of CHSA and CHSA-C have good internal consistency which supports the finding of the present study. In addition, both translated questionnaires performed well in the factor analysis. For the Malaysian parent version CHSA in regard to factor analysis; child's physical health, child's emotional health and child's activity domains support the design of the scales. However, the other domains have some items relatively weaker but not a serious problem. Only when the factor loading is below  $< 0.2$  it is considered a serious problem [\[19\]](#). Furthermore,  $KMO = 0.821$  and this indicates that data was well factored Analysis. For other studies conducted to test psychometric properties of the English versions of CHSA the validity was assessed by evaluating whether the English parent Version of CHSA scales were sensitive to differences in disease activity or severity [\[12\]](#) or by illustrating differences in the English child version of CHSA-C scale scores according to asthma symptom burden [\[20\]](#) rather than factor analysis; both two studies revealed that English CHSA questionnaires are valid to be used for research purposes which supports the finding of the present study. These findings support the use of these instruments in a different culture. Thus future studies may use this instrument to compare quality of life among asthmatic children across different countries and ethnicities. The translated versions of CHSA and CHSA-C were administered twice, over one month interval, to about 20% of the sample of the asthmatic children and their parents. Intra Class Correlation had been used to determine the correlation between test-retest responses of both asthmatic children and their parents. The findings from the present study are consistent with [Asmussen, et al. \[12\]](#)

who reported test-retest results for English parent version of CHSA which ICC values from a low of 0.60 to a high of 0.85. The present study was also consistent with Radecki, et al. [20] who reported the test-retest findings for English child version (CHSA-C). ICC values were 0.84, 0.86, and 0.89 for child's emotional health, child's physical health, and child's activity respectively. It is noticed that ICC values in English child version were better than ICC values for the Malaysian child version in the present study. This may be because the questionnaires were completed by asthmatic children after one month interval and might have resulted from a less stringent criterion for identifying stable patients, while the English version recruited only asthmatic children whose asthma remained stable with 48-hour interval as a shorter time will encourage optimal memory and also will ensure the stability of the patient's health condition. In the present study, asthmatic children and their parents completed the Malaysian version of CHSA and CHSA-C twice over one month test interval. The findings indicate that both translated CHSA and CHSA-C have acceptable test-retest reliability.

## 5. CONCLUSION

As conclusion, Results of the study reveal that the Malaysian versions of CHSA and CHSA-C are reliable and valid to use it as health outcome instrument in clinical trials and practices.

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