

ORIGINAL ARTICLE

Validity and Reliability of a Malay Version of the Management Behaviour Survey for Familial Caregivers Among Parents of Asthmatic Children in Malaysia

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ABSTRACT

Introduction: Little is known about the management behaviour of parents caring for asthmatic children. To the best of our knowledge, there is no validated instrument to measure the management behaviour of caregivers with asthmatic children in the Malay language. In this study, the objectives were to translate the Management Behaviour Survey for Familial Caregivers (MBSFC) into a Malay version and to determine its validity and reliability. **Methods:** MBSFC was translated from English into Malay by experts in paediatric asthma management. This was followed by face validation of the Malay version of the MBSFC (MBCFC-M) involving six parents with asthmatic children. Next, a cross sectional study was conducted, involving 26 parents with asthmatic children. The internal consistency reliability of the MBSFC-M was checked using Cronbach's alpha. **Results:** Face validation was done by six parents. They were asked to assess wording clarity, readability, and the formatted appearance of the questionnaire. Most of the parents report they understand the questions. In the MBSFC-M, five items were dropped from the original MBSFC, which had 20 items due to irrelevancy in local settings. The Cronbach's alpha value for this version was 0.83. **Conclusion:** The MBSFC-M showed good validity and reliability among parents of asthmatic children in Malaysia. It can be used to assess the management behaviour of Malay-speaking parents with asthmatic children in Malaysia. In future studies, it is recommended to cross-validate the MBSFC-M among parents of asthmatic children in other clinics and states in Malaysia.

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The caregivers must be educated that asthma is not purely inherited, and that episodes can be triggered by environmental factors, which play a significant role in asthma susceptibility (1).

INTRODUCTION

A caregiver's management behaviour plays an important role in asthma management in children. Until a child has reached the required level of cognitive and psychosocial development to manage their own sickness, parents are generally responsible for asthma management. The child's health status depends on the practices of caregivers at home. As the child is dependent on their caregivers' behaviours it is important to make sure that caregiver understand about asthma management.

Majority of parents learn about asthma from family members who had it or had witnessed someone having an asthma attack (2). Nookong found that children who were diagnosed with prolonged asthma, their family had been informed about asthma management by the health care providers (3). Therefore, asthmatic children and their families are aware of asthma management. In addition, they have developed asthma management skills through familiarization of recognizing symptoms, adhering to medication regimens, and identifying and

avoiding triggers.

As mothers are the main caregivers of children in many households, it is key to analyze their knowledge as well. Al-Binali et al. reported that younger mothers had less knowledge compared to older mothers. This study report that mothers' knowledge on asthma and asthma management behaviour were found to have a significant relationship (4).

Asthma in children is a chronic condition that requires regular home management. A family's management behaviour is important in order to control a child's asthma attack. This is key as strategies to maintain and enhance the quality of life (QoL) for children with asthma and prevent long-term negative effects should be initiated by the family. Wrong practices would affect the child's health status. Juliana et al. found that family with asthmatic children in Kuala Lumpur and Terengganu was still smoking and use mosquito coils at home (5). These results showed that most family with an asthmatic child did not practice the right prevention strategy for asthma.

Family caregivers reported high scores for exacerbation-intervention strategies, but low scores were reported for prevention/adherence to treatment measures. This was especially for environmental control including, use of dust-proof pillow covers, an encased mattress/box spring, avoiding chemicals, personal and household scents, and weekly hot water washing of bed covers and stuffed toys (3). Similarly, a study from Juliana et al. reported that majority of families with asthmatic children (70.6%) in Kuala Lumpur and Terengganu (76.3%) still had carpets in their home (5). Nookong reported that on the contrary, caregivers paid more attention to avoid allergy triggers both within and outside the home, compared to other general environmental controls (3).

Moreover, evidence reports poor general awareness of asthma in the community (6). This reflects that although having an asthmatic child at home, other family members practice activities that can do more harm to the child's health status. Ideally, caregivers should possess knowledge on good practices to manage asthma. With the responsibility to manage the condition lies with caregivers, they should assist children during medication administration, identify and reduce asthma triggers, recognize the early signs of asthma symptoms and manage asthma exacerbation. In addition to monitoring daily symptoms, making home environmental alterations, coordinating health care appointments, and purchasing health supplies, caregivers must also manage their child other fundamental care needs, for example school and family time, in order to manage childhood asthma (7,8,9). Evidence shows that when caregivers believe they have put in a lot of effort but aren't confident in their abilities to manage their child's asthma, the child's asthma symptoms worsen (10).

In light of these circumstances, it is important to assess the caregiver's management behaviour. Asthma management behaviors have been reported in some studies as strategies that can directly improve children quality of life (11,12). Study also report that caregiver management behaviour was related to child management behaviour (13). However, to our knowledge, there is no validated instrument to measure the management behaviour of caregivers with asthmatic children in the Malay language. Thus, this study is essential to translate the Management Behaviour Survey for Familial Caregivers (MBSFC) to a Malay version and to determine its validity and reliability.

MATERIALS AND METHODS

Study Setting and Participants

This study comprised of two parts. The first was the translation of the MBSFC into the Malay language. The second was a cross-sectional study to determine the validity and reliability of the Malay version of the MBSFC (MBSFC-M). This is summarized in a flowchart in Fig. 1. This study was conducted among caregivers with asthmatic children aged between 8 to 12 years old at the paediatric clinic of a local university hospital, Hospital Universiti Sains Malaysia (HUSM).

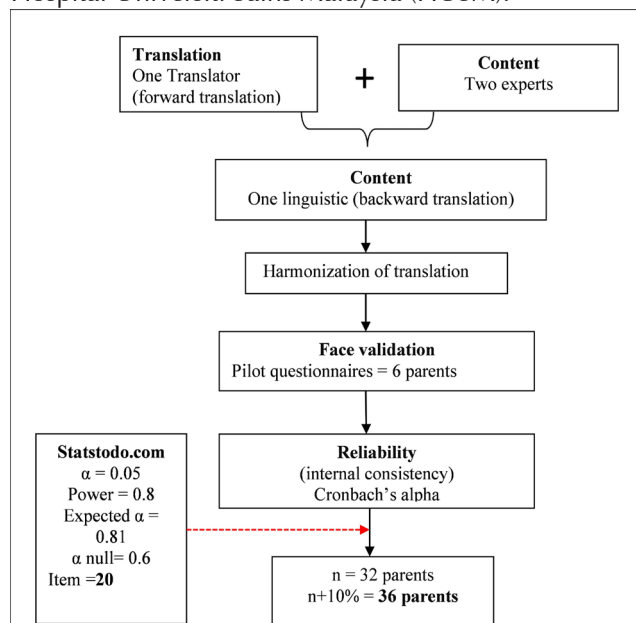


Fig 1: Flowchart

The purposive sampling method was applied due to the limited number of patients that fulfilled the required criteria. The inclusion criteria were; (1) caregivers of asthmatic children between 8 to 12 years old (2) The child had visited a health care provider for asthma in the previous year (3) The child was prescribed daily asthma medication (4) Caregivers had a telephone and (5) The primary caregiver communicates in Malay. The exclusion criteria were: (1) If the child had other

health problems (heart diseases, cancer, diabetic or other chronic condition) and (2) If parents refuse or did not consent to participate. Eligible parents were then approached at the waiting area of the clinic and they were given the Malay version of the Management Behaviour Survey for Familial Caregivers.

The sample size for internal consistency reliability analysis was calculated using a sample size calculator for Cronbach's alpha at Statstodo.com, with $\alpha = 0.05$, power = 0.8, expected $\alpha = 0.81$, α null = 0.6 and item number = 20. A sample of 32 parents was required for the analysis, or 36 parents after the inclusion of a 10% expected drop-out rate.

Management Behaviour Survey for Familial Caregivers (MBSFS)

The MBSFC developed by Nookong was adapted in this study (3). The original instrument was in English and comprised of 20 items. All questions used a five-point Likert-type response ranging from 1-5, with a score of "1" indicating that a certain behaviour was never performed and "5" indicating that the behaviour was always performed. If necessary, respondents could use the option "not applicable" score = "8" (3). The original questionnaire had three sections. They were prevention/adherence to treatment (12 questions), assessment and monitoring (four questions) and exacerbation – intervention strategies (four questions). Internal consistency was reported with a Cronbach's alpha of 0.73 in the original study (3). MBSFC questionnaire is specifically to measure asthma management behaviour of caregiver at home. The modified instrument has 15 items consisting of the same indicators: asthma prevention activities (eight items); asthma assessment and monitoring (three items); and asthma exacerbation-intervention activities (four items). All of the questions used a five point, Likert-type responses ranging from 1-5, with "1" for never performed to "5" for always performed with possible range 0-75. The higher scored showed the greater practiced in behaviour management for asthma

Translation of MBSFC into Malay

Forward translation was done by a researcher and the first draft was sent to three experts in paediatric asthma for revision and comments. The experts review the sentence structure, problematic words and phrases that are not suitable in Malaysia context. Then the word was replaced with contextually synonymous terms. Correction was done based on comments and the modified measurement was sent back a second time for confirmation. The translated content was then sent to the linguistic department of the University Sains Malaysia (USM) for backward translation. Harmonization of translation was done by experts and three paediatric asthma experts. An expert panel assessed the questionnaire's content validity. The five expert panel consisted of a pediatric specialist, a pediatric lecturer,

a biostatistician and two linguistic lecturers.

The questionnaire was then checked for face validation by six parents with asthmatic children. They were asked to assess wording clarity, readability, and the formatted appearance of the questionnaire. Second modifications were made following their suggestions and corrections. Parents were also asked to read the questions and comments if they had any problems in understanding the questions. Most parents reported having problems in differentiating question number one and two. They suggested to bold the words "triggers outside" and "triggers inside" the home to avoid misunderstanding.

Ethics

Permission to conduct the study was obtained from the Ethical committee of USM prior to the data collection process, reference number: USM/JEPeM/140381. An ethical clearance from Hospital Universiti Sains Malaysia was gained to conduct this study among parents with asthmatic children, reference number: HUSM/11/020/Jld.6. Parents provided their written consent prior to data collection.

Statistical Analysis

The data was analysed using the Statistical Package for Social Sciences (SPSS) version 22. Internal consistency reliability was determined by Cronbach's alpha, where a value of > 0.7 was considered as a good reliability (14,15).

RESULT

A total of 37 parents responded to the Malay version of the MBSFC. The parents' characteristics presented in Table I include gender, age, ethnicity, education level, monthly income, family member who is smoking and history of asthma. Majority of the parents were females (n = 33, 89.2%). Data revealed that age of the parents ranged from 29 to 68 years (Mean = 40.57, SD = 7.39). All parents were Malay (n = 37, 100.0%). Most of the family members were smokers (n = 22, 59.5%), as reported by the parents. Most of the parents (n = 30, 81.1%) reported a family history of asthma.

Five questions were removed from the questionnaire due to irrelevancy to the Malaysian local community. The five questions were question number six "Vacuum carpet at least two times a month", question number eight "Use furnace and air conditioner filters and change the filter regularly", question number ten "Have influenza vaccine yearly", question number 11 "Have a written asthma management plan at home" and question number 13 "Use peak flow meter". These questions were removed as most parents responded as "not applicable" (score of 8). Families in the community did not practice or do not have the stated items at home.

Table I: Frequency distribution of parent’s characteristic (n=37)

Parents characteristic	Frequency (Percent %)	Mean (year)
Gender		
Female	33 (89.2)	40.57 (SD = 7.39)
Male	4 (10.8)	
Age		
Ethnicity		
Malay	37 (100.0)	
Education level		
Primary school	4 (10.8)	
Secondary school	22 (59.5)	
College / university	11 (29.7)	
Monthly income		
Low income	18 (48.6)	
Moderate income	7 (18.9)	
High income	12 (32.4)	
Family members who are smoker		
Yes	22 (59.5)	
No	15 (40.5)	
History of asthma		
Yes	30 (81.1)	
No	7 (18.9)	

Detailed modifications to the questionnaire are summarized in Table II. The modified instrument has 15 items consisting of the same indicators: asthma prevention activities (eight items); asthma assessment and monitoring (three items); and asthma exacerbation-intervention activities (four items).

Table II: The modification of management behaviours survey for familial caregivers

Question number	Original version	Modified version	Reason to change
Question 6	Vacuum carpet at least 2 times a month	Deleted	Deleted because not applicable to our community where majority of the family who have asthmatic child do not have carpet at their home
Question 8	Use furnace and air conditioner filters and change the filter regularly	Deleted	Deleted because not applicable to our community where majority of the family who have asthmatic child do not have air conditioner at their home
Question 10	Have influenza vaccine yearly	Deleted	Deleted because not applicable to our community where the influenza vaccine is not compulsory and Malaysia do not have four season.

CONTINUE

Table II: The modification of management behaviours survey for familial caregivers (cont.)

Question number	Original version	Modified version	Reason to change
Question 11	Have a written asthma management plan at home	Deleted	Deleted because not applicable to our community where majority of the parents said they did not been given an asthma management plan from clinic.
Question 13	Use peak flow meter	Deleted	Deleted because not applicable to our community where majority of the parents said they do not have peak flow meter at home

The Cronbach’s alpha value for the MBSFC-M was 0.83, based on the data analysis from 26 parents (Table III). However, data from the remaining 11 parents could be not utilized for Cronbach’s alpha analysis because of missing values (i.e. not applicable responses). The item-total statistics and item statements are shown in Table IV.

Table III: Item-Total Statistics for Management Behaviours Survey for Familial Caregivers among pilot study (n=26)

Question Number	Statement	Corrected item-total correlation	Cronbach’s Alpha if Item Deleted	Cronbach’s Alpha
1	Avoid allergic triggers outside the home (second-hand smoke, pollen, dust)	.636	.807	.83
2	Avoid allergic triggers inside the home (second-hand smoke, dust, pet, mold, cockroaches)	.622	.807	
3	Remove allergic triggers from bedroom (fur stuff animals, down comforters, pets)	.391	.823	
4	Avoid chemicals, personal, and household scents (perfumes, air fresheners, cleaning agents)	.448	.820	
5	Use dust-proof pillow covers an encased mattress/box spring	.599	.809	
7	Wash bed covers, stuffed toys weekly in hot water	.433	.821	
9	Regularly use preventive prescribed medication	.016	.848	
12	Have asthma medication with the child at all time	.238	.834	
14	Recognize early signs of asthma (cough, stuffy/runny nose, waken up at night)	.058	.820	
15	Recognize asthma symptoms (wheezing, breathing difficulty)	.676	.814	

CONTINUE

Table III: Item-Total Statistics for Management Behaviours Survey for Familial Caregivers among pilot study (n=26) (cont.)

Question Number	Statement	Corrected item-total correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
16	Count the number of times your child uses rescue medications when asthma symptoms are present	.203	.833	
17	Correctly use rescue medication	.647	.810	
18	Add medication based on symptoms /signs	.497	.817	
19	Remove triggers	.578	.814	
20	Communicate with a doctor or nurse for asthma exacerbation and the treatment plan	.651	.811	

Mean (SD) = 56.88 (10.06)

Table IV: Item-Total Statistics for Management Behaviours Survey for Familial Caregivers among pilot study (n=26)

Question number	Statement	Mean (SD)	Range (Low-High)
1	Avoid allergic triggers outside the home (second-hand smoke, pollen, dust)	3.80 (1.29)	(1-5)
2	Avoid allergic triggers inside the home (second-hand smoke, dust, pet, mold, cockroaches)	3.80 (1.52)	(1-5)
3	Remove allergic triggers from bedroom (fur stuff animals, down comforters, pets)	4.11 (1.24)	(1-5)
4	Avoid chemicals, personal, and household scents (perfumes, air fresheners, cleaning agents)	3.53 (1.33)	(1-5)
5	Use dust-proof pillow covers an encased mattress/box spring	2.46 (1.77)	(1-5)
7	Wash bed covers, stuffed toys weekly in hot water	2.42 (1.41)	(1-5)
9	Regularly use preventive prescribed medication	3.84 (1.31)	(1-5)
12	Have asthma medication with the child at all time	4.11 (1.33)	(1-5)
14	Recognize early signs of asthma (cough, stuffy/runny nose, waken up at night)	4.50 (0.70)	(2-5)
15	Recognize asthma symptoms (wheezing, breathing difficulty)	4.53 (0.70)	(2-5)
16	Count the number of times your child uses rescue medications when asthma symptoms are present	3.84 (1.04)	(1-5)
17	Correctly use rescue medication	4.34 (1.01)	(1-5)
18	Add medication based on symptoms / signs	3.46 (1.42)	(1-5)
19	Remove triggers	4.30 (0.92)	(1-5)
20	Communicate with a doctor or nurse for asthma exacerbation and the treatment plan	3.76 (0.90)	(1-5)
Total	Mean score	56.88 (10.06)	(5-75)

DISCUSSION

The MBSFC was translated to Malay and its validity and reliability determined. Content validation was conducted via a detailed translation process. Here, the translation and harmonization involved experts relevant to the content of the MBSFC. This yielded the initial version of the MBSFC-M. This was followed by face validation, which involved parents of asthmatic children, from whom their suggestions and comments were taken into account to further improve the initial version of the MBSFC-M. The MBSFC-M was then checked for internal consistency reliability with other parents of asthmatic children, from which the reliability was good with a Cronbach's alpha value of 0.83, for the version with 15 items.

The internal consistency of the MBSFC-M far exceeded the minimum cut off set for the Cronbach's alpha for good reliability, which was > 0.7. This finding was better than the original version of MBSFC from Nookong, which was 0.73 (3). This instrument also was used in a study by Horner and Fouladi (8), who reported internal consistency of .82 (Cronbach's alpha) using 16 items of the instrument. While other study report that the Cronbach's alpha for reliability was 0.81 using 29 items of the instruments (13). However, it should be noted that the original MBSFC consisted of 20 items, while the MBSFC-M consists of 15 items. Thus, the interpretation of the result should take into account the differences in the number of items. Other studies which validated the MBSFC could not be identified, so the findings in the present study can only be compared to the original MBSFC study (3).

This study had a number of limitations. Firstly, due to limited resources, the sampled parents was limited to a paediatric clinic in a teaching hospital in the state of Kelantan (HUSM), which is located in the east coast of Malaysia. The population in this community is predominantly of the Malay ethnicity, explaining the current study's ethnic demographic. This may limit the generalizability of the current results as Malaysia is a multiracial country with different ethnicities. It is recommended that cross-validation studies are conducted in other locations in Malaysia to improve the sample composition to be more representative of the Malaysian population. Secondly, the minimum calculated sample size for Cronbach's alpha analysis is 32 parents. However, because of missing values for a number of items, only the data for 26 parents could be analyzed. This might have impacted the power of the analysis. The post-hoc power of 0.81 was obtained after calculating post-hoc power for the analysis (for $\alpha = 0.05$, obtained $\alpha = 0.83$, α null = 0.6 and item number = 15). Thus, the sample size for the reliability analysis in this study was sufficient despite a drop in the sample size. Thirdly, Cronbach's alpha was used as a measure of internal consistency reliability, which also indicated

the internal structure validity of the MBSFC. Ideally, internal structure validity is analyzed by factor analytic methods, which are exploratory factor analysis (EFA), and confirmed by confirmatory factor analysis (CFA). However, due to the study limitation, the number of children and parents that fulfilled the study criteria was limited. For that reason, Cronbach's alpha was utilized in this study, which provided a commonly used measure of internal structure validity.

CONCLUSION

The Malay version of the MBSFC, namely MBSFC-M, showed good validity in terms of content and face validity among parents of asthmatic children in Malaysia. MBSFC-also have a good reliability with a Cronbach's alpha value of 0.83. The translated version can be used to assess the management behaviour of Malay-speaking parents with asthmatic children in Malaysia. In future studies, it is recommended to cross-validate the Malay version of the MBSFC among parents of asthmatic children in other clinics and states in Malaysia.

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