



The linguistic and construct validity of the Malay version of the Coping Self-Efficacy Scale (CSES-My): Evidence from a sample of Malaysian parents of children with leukemia or lymphoma

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Abstract

Background: Parents of children with hematological cancers such as leukemia and lymphoma need to cope with stress related to their child's diagnosis. The Coping Self-Efficacy Scale is a widely used and validated tool to measure an individual's confidence in dealing with stressful situations. Appropriate translation and validation are needed to produce a localized language version suitable for Malaysian contexts.

Objective: The study aimed to examine the linguistic and construct validity of the Malay version of the Coping Self-Efficacy Scale (CSES-My) among parents of children with hematological cancer.

Methods: The CSES-My was created through a sequential series of steps, starting with the translation of the original English version, followed by cultural adaptation, and then cognitive interviewing. The 26-item CSES-My was self-administered in a sample of parents of children with leukemia and lymphoma from October 2021 until February 2022. They were recruited via online or face-to-face methods. Exploratory factor analysis was performed to examine the construct validity of the CSES-My.

Results: A total of 165 complete responses were analyzed. The scale has two factors, including Personal Coping and Social Coping, accounting for 58.3% of the variance. Personal Coping (19 items, Cronbach's alpha = 0.958) represented the respondents' self-efficacy for independently executing coping strategies, whether through solving problems or changing the way they think about the situation. Social Coping (6 items, Cronbach's alpha = 0.867) represented their confidence in executing coping strategies, which involved using social resources such as seeking external support, distraction, and avoiding loneliness.

Conclusions: The CSES-My had reliable and valid psychometric properties, providing evidence for its utility in evaluating coping self-efficacy among parents of children with leukemia or lymphoma in Malaysia. The CSES-My is a valuable tool for nurses and other healthcare professionals investigating coping self-efficacy in Malay-speaking populations, and it may also aid in the development of future coping interventions.

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Keywords

Malaysia; coping skills; self-efficacy; leukemia, lymphoma; psychometrics; factor analysis; linguistics; parents; child

Background

Childhood cancer is a significant health concern worldwide. The Global Cancer Observatory (GLOBOCAN) 2020 estimated 279,419 new cases of cancer in children under 19 years old (Ferlay et al., 2020). Among these, hematological cancers were the most common forms of cancer in children. Leukemia represented 10.9%, while lymphoma (both

Hodgkin's and non-Hodgkin's) represented 3.5% of childhood cancers worldwide (Ferlay et al., 2020).

In Malaysia, leukemia accounted for 25.1% and lymphoma approximately 5.4% of childhood cancers (Ferlay et al., 2020). Besides mortality, hematological cancers result in a high burden of care. Leukemia resulted in an age-standardized disability-adjusted life year (DALY) rate of 148.2 per 100,000 children, while lymphoma resulted in an age-standardized

DALY rate ranging from 7.1 to 24.6 per 100,000 children (Wu et al., 2022).

The diagnosis of a child with cancer inevitably brings about stress, especially during the initial diagnosis and treatment phase. Current standards of care for children with cancer emphasize the importance of providing sufficient psychosocial support to help parents navigate and cope with this stress (Kearney et al., 2015). Parents employ various cognitive and behavioral strategies to manage the stress associated with their child's diagnosis, including problem-focused, emotion-focused, and future-oriented coping (Biggs et al., 2017; Folkman & Moskowitz, 2004). For example, some parents may cope with the stress of diagnosis by seeking more information as part of problem-focused coping. In contrast, others may distract themselves or share their emotions with their social circle as part of emotion-focused coping. The choice of coping strategies can vary based on the individual's circumstances, past experiences, and belief in their ability to manage effectively, also known as coping self-efficacy.

Coping self-efficacy refers to an individual's perceived capability to handle challenges or threats effectively (Chesney et al., 2006). Previous research has demonstrated that coping self-efficacy mediates emotional regulation and influences coping behaviors (Luberto et al., 2014). For parents of children with undiagnosed medical conditions, a higher level of coping self-efficacy has been linked to positive stress responses and enhanced self-esteem (Yanes et al., 2017).

The development of the Coping Self-Efficacy Scale (CSES) aimed to create a valid tool for evaluating the effectiveness of a coping effectiveness training intervention (Chesney et al., 2006). The CSES has been validated to measure a person's self-efficacy in coping with general stressful situations. Understanding a person's coping self-efficacy could provide insight into how they might cope with stress, as self-efficacy precedes behavior according to Bandura's theory of self-efficacy (Bandura, 1978).

The CSES has been utilized in various studies examining coping in parents, including those of children with undiagnosed medical conditions (Yanes et al., 2017) and congenital heart disease (Choi & Lee, 2021). Yanes et al. (2017) discovered a positive association between coping self-efficacy and stress response, while Choi and Lee (2021) revealed that coping self-efficacy was linked to lower levels of parenting stress. Furthermore, the CSES has been employed in diverse populations beyond parents (Dugyala & Poyrazli, 2021; Scheyett et al., 2010; Timkova et al., 2020; Tran et al., 2022; Yuan et al., 2018), highlighting its utility in measuring coping self-efficacy across different groups. However, to date, the CSES has not been used in the context of parents of children with cancer.

An advantage of the CSES is its non-specificity to stressful events (Chesney et al., 2006), making it highly applicable in pediatric cancer where multiple stress-inducing situations can occur. Building resilience in parents to effectively confront these stressors is a crucial objective of psychosocial support (Rosenberg et al., 2013). Notably, the self-efficacy of parents with children diagnosed with cancer has been linked to their underlying resilience (Rosenberg et al., 2013). Consequently, the CSES holds significant promise as an outcome measure in psychosocial interventions aimed at supporting parental coping.

Another commonly used cancer coping self-efficacy tool, the Cancer Behavior Inventory (Merluzzi et al., 2001), was designed for adult cancer patients. This tool is less suitable for measuring coping self-efficacy among parents of children with cancer because the items related to coping behaviors are cancer-specific and include dealing with cancer symptoms. Parents often face stressors that are not directly related to the cancer itself, such as employment, income, and caring for other family members. Therefore, the Cancer Behavior Inventory is less suitable for studying coping self-efficacy among parents who are primary caregivers for children. Conversely, the CSES lists commonly used coping behaviors that are applicable to general stressful situations.

The development of a validated Malay language tool would be precious in advancing research related to coping self-efficacy among Malaysian parents of children with cancer. With a reliable and validated instrument in their native language, researchers and healthcare professionals could more accurately assess coping strategies, emotional responses, and social support among this specific population. This would not only enhance the understanding of how Malaysian parents navigate the challenges posed by their child's cancer diagnosis but also contribute to the development of targeted and culturally appropriate psychosocial interventions to support and empower these parents during their difficult journey.

Initially, the scale consisted of 26 items in English, requiring participants to rate their perceived self-efficacy in coping behaviors when confronted with challenges or threats. Participants were given a Likert scale ranging from 0 (cannot do at all) to 10 (certain can do) to provide their responses. The sum of all items provided the total score for general coping self-efficacy. Through validation, the original tool was found to measure three dimensions: "Using Problem-Focused Coping," "Stopping Unpleasant Emotions and Thoughts," and "Seeking Social Support" (Chesney et al., 2006). However, only 13 items were retained within these three factors. Nonetheless, administering the complete tool without excluding the dropped items was recommended.

The validity of the English version of the CSES has been examined in diverse populations, including men living with HIV (Chesney et al., 2006), military service members receiving mental health treatment (Cunningham et al., 2020), and healthy adults in the United Kingdom (Colodro et al., 2010). Additionally, the CSES has been translated into various languages, such as Chinese (Yuan et al., 2018), Persian (Mahmoudi et al., 2015; Tol et al., 2014), Vietnamese (Tran et al., 2022) and Korean (Choi & Lee, 2021).

When a tool is translated for use in a different population, it is crucial to reassess its psychometric properties to establish its construct validity in the new context. Among the past validation studies conducted for CSES, two studies used only Exploratory Factor Analysis (EFA) (Colodro et al., 2010; Tol et al., 2014), and another three used Confirmatory Factor Analysis (CFA) (Cunningham et al., 2020; Mahmoudi et al., 2015; Tran et al., 2022).

The Vietnamese version yielded a three-factor solution (i.e., emotion-focused, problem-focused, and social support). In contrast, the Persian version yielded a four-factor solution (i.e., stopping unpleasant emotions and thoughts about diabetes, using problem-focused coping, self-efficacy in

diabetes problem-solving, and getting support from friends and family). Therefore, obtaining a different factor structure is possible when the translated tool is tested in a new population. Hence, validating a local language version of the CSES is necessary to guide cross-cultural comparisons while ensuring the validity of the measurement.

Nurses play an essential role in providing psychosocial support for patients and their family members, especially in pediatric oncology nursing. Measuring coping self-efficacy in the local setting will offer new insights into coping, particularly in Asian populations. Asian populations may cope with stress differently from Western populations due to cultural reasons. A validated tool is therefore needed and may facilitate the development of future coping interventions for the local population.

Therefore, this study aimed to examine the linguistic and construct validity of the Malay version of the Coping Self-Efficacy Scale (CSES-My) for use in local parents of children with leukemia and lymphoma.

Methods

This study is part of a larger study evaluating the effectiveness of an online caregiver education resource for Malaysian parents of children with leukemia or lymphoma (Tan et al., 2024; Tan et al., 2022). The translation and validation of the CSES-My involved two phases: linguistic validation and construct validation, using accepted methods (Prinsen et al., 2018; Watkins, 2018; Wild et al., 2005).

Ethical Consideration

The study received ethical approval from the Ministry of Health Malaysia (NMRR-21-513-58896) and Universiti Kebangsaan Malaysia (JEP-2021-413). All participants received verbal and written information about the study and provided informed consent before participating.

Linguistic Validation Phase

The translation and linguistic validation process adhered to the guidelines set by the ISPOR Task Force for Translation and Cultural Adaptation (Wild et al., 2005). The linguistic validation phase was led by a translation team consisting of four bilingual experts. Among them were two consultant family medicine physicians and two consultant pediatricians (one pediatric oncologist and one clinical geneticist). All experts were proficient in English and Malay, with two being native Malay speakers. Additionally, all four were familiar with providing psychosocial support for pediatric cancer.

After obtaining permission from the original author, the translation and validation of the CSES (Chesney et al., 2006) involved a comprehensive process. Content validity is established through the item development process and the evaluation of items' relevance and representativeness by a panel of experts. The original CSES was developed in collaboration with experts in self-efficacy and coping theory, including Professor Albert Bandura and Professor Susan Folkman (Chesney et al., 2006), ensuring adequate content validity. Therefore, content validation was not reiterated for the Malay version.

All 26 items of the CSES were included in the validation study following discussions with the original author. The scale

was translated into Malay by two independent certified bilingual translators. The translation team reviewed and compared the forward translation versions, resulting in a harmonized Malay version. Subsequently, another two independent certified bilingual translators translated the harmonized Malay version into English. All four translators were professional non-clinician translators. Any differences in wording were discussed with the original author for appropriate revisions. Additionally, potentially challenging terms were identified for testing during the cognitive interviewing phase. Table 1 shows part of the forward translation report, highlighting challenges in translating certain terms and decisions made by the translation team.

Table 1 Part of the forward translation report

Examples of the forward translation process	
Item	Title
Original English	Coping Self-Efficacy Scale
Forward-translation 1	"Skala Keberkesanan Diri Menghadapi Tekanan"
Forward-translation 2	"Skala Keberkesanan Diri Menghadapi Sesuatu"
Forward-translation reconciled	"Skala Keberkesanan Diri Menghadapi Tekanan"
Comments	There is no native Malay term for the word "coping." The Malay term " <i>daya tindak</i> " is used in the academic psychology field but is not commonly used in everyday language " <i>Menghadapi tekanan</i> " means "facing pressure", whereas " <i>menghadapi sesuatu</i> " means "facing something". In the local Malaysian context, facing psychological pressure is the closest to coping
Item	1
Original English	Keep from getting down in the dumps
Forward-translation 1	"Mengelakkan diri daripada menjadi <i>sugul</i> "
Forward-translation 2	"Menjauhkan rasa <i>murung</i> "
Forward translation reconciled	"Mengelakkan diri daripada rasa <i>murung</i> "
Comments	" <i>Sugul</i> " is less commonly used as a term for "depressed," whereas " <i>murung</i> " is a more widely used term for "depressed" " <i>Mengelakkan diri</i> " means "to avoid" and is the closest to the context of keeping away from something

Cognitive interviewing was performed to determine the face validity and comprehensibility of the CSES-My. Participants were purposively sampled from different genders, age groups, ethnicities, and education levels. They completed the Malay version and were asked to provide their interpretations of potentially difficult terms. Based on their recommendations, final revisions were made to the Malay version of the CSES-My after a series of discussions involving the original author of the CSES. Figure 1 displays a summary of the linguistic validation process. The finalized CSES-My was then used for the construct validation phase.

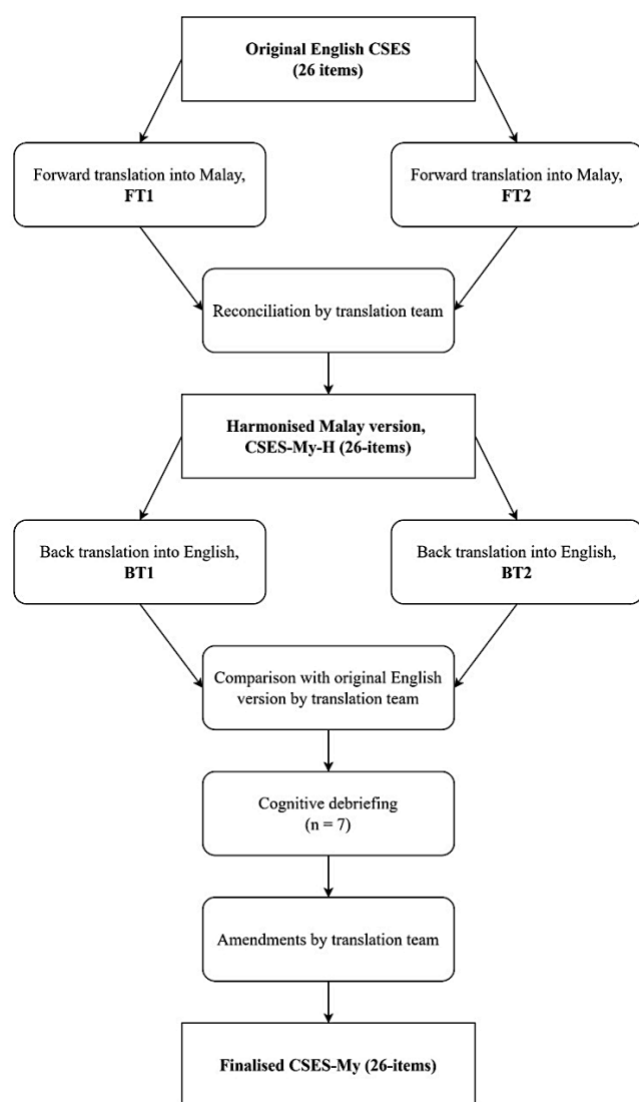


Figure 1 The linguistic validation process

Construct Validation Phase

The CSES-My was intended to serve as an outcome measure for a trial involving parents of children with leukemia or lymphoma. Therefore, a cross-sectional validation study was conducted among this population.

The inclusion criteria for this study were adult parents of patients diagnosed with leukemia or lymphoma before the age of 18 years who were proficient in reading and understanding Malay. There were no specific restrictions regarding the duration of diagnosis or the stage of treatment. This approach aimed to include a diverse range of parents who might have varied levels of stress and coping self-efficacy, aligning with the objectives of the validation study. Patients themselves or other relatives were excluded from participating. A sample size between 100 and 200 is considered acceptable for EFA (Tabachnick & Fidell, 2013). To ensure a variables-to-factor ratio of 5 with high communalities, a minimum sample size of 130 was required (Mundfrom et al., 2005). The intended sample size was adjusted to 163 after accounting for a potential 20% of incomplete responses.

Data were collected between October 2021 and February 2022, utilizing online methods and face-to-face data collection at two major pediatric oncology centers in Kuala Lumpur, Malaysia. These methods were chosen due to institutional

COVID-19 pandemic restrictions during the data collection period. An anonymous online survey using Google Forms was distributed via social media and local cancer support groups. Posters advertising the online survey were also displayed at the two pediatric oncology centers. Potential participants accessed a softcopy of the participant information sheet and indicated consent online before proceeding with the survey.

For face-to-face recruitment, eligible parents were conveniently sampled from pediatric oncology wards and clinics at both centers. Given the limited study population, all parents present at these sites were approached for inclusion. Participating parents provided written informed consent and completed data collection forms while awaiting consultation or in the ward. Both online and face-to-face data collection used identical forms, gathering sociodemographic information such as age, gender, ethnicity, level of formal education, and household income status of the parents. Participants also provided details about their child's diagnosis, age at diagnosis, time since diagnosis, and current treatment phase (whether ongoing or completed). Additionally, parents completed the CSES-My. Personal identifying information was not collected, and all responses were kept confidential, with access restricted to the research team members.

IBM SPSS Statistics version 28 and IBM SPSS Amos version 28 were used for data analysis. Initially, CFA based on the original 13-item CSES factor structure (Chesney et al., 2006; Cunningham et al., 2020) was performed. However, CFA indicated a poor fit between the data and the factor structure. The chi-square goodness of fit was significant (213.979, df 62, $p < 0.001$), comparative fit index (CFI) = 0.885, root mean square error of approximation (RMSEA) = 0.122, and standardized root mean square residual (SRMR) = 0.0939. According to Meyers et al. (2016), for a model to achieve a good fit, the chi-square goodness of fit should not be significant, CFI should be at least 0.90, RMSEA should be less than 0.05, and SRMR should be less than 0.08. Therefore, EFA was conducted to explore the preliminary factor structure of the translated tool.

Only complete responses for the CSES-My were included in the analysis. Descriptive analysis was used to describe participants' sociodemographic characteristics and their child's clinical characteristics. Prior to factor analysis, all items were assessed for normality and linearity. Normality was defined as item skewness between -2 to +2 and kurtosis between -7 to +7 (Watkins, 2018). Linearity was evaluated by examining the inter-item correlation matrix. The number of factors to extract was determined using Cattell's Scree test and Horn's parallel analysis (Watkins, 2018). Horn's parallel analysis involved generating a set of random eigenvalues using Monte Carlo PCA for Parallel Analysis software (Watkins, 2018). Only factors with eigenvalues exceeding the random eigenvalues were retained.

Factor analysis using the maximum likelihood method with Promax rotation was conducted. The maximum likelihood method is appropriate when multivariate normality exists, and there are strong factor-variable relationships (Watkins, 2018). Promax rotation was employed to accommodate correlations between factors, which is typical in psychology research on coping self-efficacy domains (Chesney et al., 2006). In this study, a pattern coefficient greater than 0.512 was considered significant at $p < 0.01$ for sample sizes between 100 and 200

(Field, 2009, p. 644). Items with factor loadings below 0.512 were excluded from further analysis. Internal consistency reliability was assessed using Cronbach's alpha coefficient, with values above 0.70 indicating good internal consistency (Tavakol & Dennick, 2011).

Results

Linguistic Validation Phase

Cognitive interviewing was conducted with seven participants aged between 19 and 55, with a median age of 49. The

majority of participants were female ($n = 5$), Malay ($n = 5$), and had completed tertiary education ($n = 5$). All participants were able to understand the Malay version well. Some amendments to the wording of the items were recommended to ensure the language did not sound odd and to improve understanding (see Table 2). For example, for item 23, the Malay term for 'meditate' was 'bertafakur.' However, this term is rarely used in everyday language and is less familiar to non-Malay participants. Therefore, an alternative translation, 'bermeditasi,' a borrowed term from English, was added in brackets to the item.

Table 2 Amended terms following cognitive interviewing

Item No.	Original English Item	Malay Version	Comments
1	Keep from getting down in the dumps	"Mengelakkan diri daripada rasa murung atau terlalu sedih." (Avoiding self from feeling depressed or too sad)	"Down in the dumps" is an English idiom meaning extremely sad or depressed. Therefore, the Malay version could not be directly translated and had to be revised.
6	Break an upsetting problem into smaller parts	"Membahagikan masalah yang menyusahkan hati kepada bahagian yang lebih kecil agar mudah diselesaikan." (Dividing an upsetting problem into smaller parts so that it is easily solved)	During cognitive debriefing, participants preferred to add the explanatory phrase "so that it is easily solved" to help them understand the concept of breaking a problem into smaller parts.
23	Pray or meditate	"Bersembahyang atau bertafakur (bermeditasi)." (Pray or meditate)	Both terms "bertafakur" and "bermeditasi" meant meditate. From cognitive debriefing, non-Malay participants did not understand the term "bertafakur" but understood the term "bermeditasi." Therefore, this term was added to improve clarity.
26	Resist the impulse to act hastily under pressure	"Menahan diri daripada bertindak secara terburu-buru apabila tertekan." (Stop self from acting hastily when under pressure)	The translators used the term "gerak hati" for impulse. However, during cognitive debriefing, participants suggested removing the phrase to make the sentence more concise and easily understood.

Construct Validation Phase

A total of 172 responses were obtained, but only 165 were analyzed after excluding incomplete ones. Of these, 65.5% were from physical recruitment and 34.5% from online recruitment. The response rate could not be calculated due to the online survey. Table 3 shows the parents' sociodemographic characteristics and their children's clinical profiles.

All items for the CSES-My met the criteria for normality and linearity. The Kaiser-Meyer-Olkin measure was 0.927, indicating excellent sampling adequacy (Field, 2009), and Bartlett's test of sphericity was significant ($p < 0.001$), confirming suitable for factor analysis. Examination of the scree plot (Figure 2) showed that two factors should be retained, confirmed by Horn's parallel analysis (Table 4).

Table 5 displays the pattern coefficients from the EFA. No cross-loading was observed for any items. The item "Get emotional support from friends and family" had a low factor loading of 0.426 for Factor 1 and 0.180 for Factor 2. Factor 1 and Factor 2 were moderately correlated, with $r = 0.671$. The first factor consisted of 19 items representing various coping strategies individuals could employ independently to address problems and reshape their perspectives. Consequently, this factor was labeled "Personal Coping." The second factor, comprising six items, reflected coping strategies reliant on social resources, including seeking support, diverting attention from the issue, and avoiding loneliness. This factor was called "Social Coping." Both subscales demonstrated good internal consistency, with Cronbach's alpha coefficients of 0.96 and 0.87, respectively.

Table 3 Respondents' sociodemographic characteristics and their child's clinical profile

Variables	n (%)	Mean (SD)
Parent's age (years)		40.0 (7.8)
Gender		
Male	37 (22.4)	
Female	128 (77.6)	
Ethnicity		
Malay	131 (79.4)	
Chinese	9 (5.5)	
Indian	9 (5.5)	
Others	16 (9.7)	
Household income category^a		
Low	101 (61.2)	
Middle	51 (30.9)	
High	12 (7.3)	
Missing data	1 (0.6)	
Education level		
Primary	5 (3.0)	
Secondary	68 (41.2)	
Tertiary	57 (34.5)	
Missing data	35 (21.2)	
Child's diagnosis		
Leukemia	144 (87.3)	
Lymphoma	21 (12.7)	
Child's age on diagnosis (years)		5.3 (3.5)
Duration of diagnosis (years)		3.8 (4.2)
Treatment phase		
Undergoing treatment	66 (40.0)	
Completed treatment	99 (60.0)	

Note: ^a = Household income was categorized as low (<USD1013), middle (USD 1013-2290), and high (>USD 2290) per the Department of Statistics Malaysia (2020)

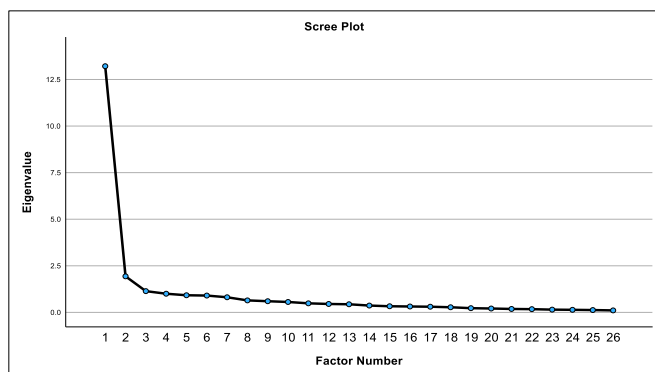


Figure 2 Scree plot

Table 4 Horn’s parallel analysis for determining the number of factors to extract

Factor	Eigenvalue	Random eigenvalue from parallel analysis	Decision
1	13.212	1.8242	Retained
2	1.935	1.6929	Retained
3	1.140	1.5816	Dropped
4	1.002	1.4955	Dropped

Table 5 Pattern coefficients for the Malay version of the Coping Self-Efficacy Scale (CSES-My)

Item Number	Item Statement	Factor	
		1	2
CSES14	Try other solutions to your problems if your first solutions don't work	0.918	-0.045
CSES6	Break an upsetting problem down into smaller parts	0.841	-0.184
CSES15	Stop yourself from being upset by unpleasant thoughts	0.812	-0.007
CSES12	Keep from being sad	0.803	-0.013
CSES7	Leave options open when things get stressful	0.775	-0.003
CSES2	Talk positively to yourself	0.766	-0.088
CSES8	Make a plan of action and follow it when confronted with a problem	0.763	0.067
CSES26	Resist the impulse to act hastily when under pressure	0.743	0.085
CSES25	Stand your ground and fight for what you want	0.731	0.037
CSES13	See things from the other person's point of view during a heated argument	0.730	0.107
CSES3	Sort out what can be changed and what cannot be changed	0.720	0.037
CSES10	Take your mind off unpleasant thoughts. Stop unpleasant thoughts	0.712	-0.056
CSES5	Find solutions to your most difficult problems	0.672	0.106
CSES19	Make unpleasant thoughts go away	0.651	0.106
CSES11	Look for something good in a negative situation	0.635	0.148
CSES1	Keep from getting down in the dumps	0.630	-0.132
CSES23	Pray or meditate	0.556	0.078
CSES20	Think about one part of the problem at a time	0.548	0.317
CSES18	Do something positive for yourself when you are feeling discouraged	0.546	0.264
CSES4	Get emotional support from friends and family	0.426	0.180
CSES16	Make new friends	-0.229	0.916
CSES17	Get friends to help you with the things you need	-0.097	0.903
CSES9	Develop new hobbies or recreations	-0.012	0.742
CSES24	Get emotional support from community organizations or resources	0.075	0.546
CSES21	Visualize a pleasant activity or place	0.237	0.536
CSES22	Keep yourself from feeling lonely	0.196	0.532
	Eigenvalue	13.212	1.935
	% of variance	50.816	7.444
	Cronbach's alpha	0.958	0.867

Discussion

This study aimed to evaluate the linguistic and construct validity of the CSES-My among parents of children diagnosed with leukemia and lymphoma in Malaysia. This study was the first to administer the CSES-My to this specific population. The back-to-back translation process and cognitive interviewing ensured the linguistic validity of the CSES-My by maintaining conceptual equivalence with the original CSES. This process ensured that the translation did not alter the concepts of the items while maintaining understandability for the target respondents (Hambleton & Patsula, 1998).

As previously mentioned, past validation studies of the CSES in various versions obtained varying factor structures. Most of these studies reported a 3-factor model, except for the Iranian version (Tol et al., 2014), which had a 4-factor model. The factors obtained from prior studies were similar, focusing

on problem-focused coping, stopping unpleasant emotions, and securing support from friends and family (Colodro et al., 2010; Cunningham et al., 2020; Mahmoudi et al., 2015; Tran et al., 2022). However, the CSES-My demonstrated a 2-factor structure based on the Scree plot and Horn’s parallel analysis. This 2-factor structure no longer supported the problem-focused, emotion-focused, and social aspects of coping seen in previous validation studies.

The first factor, Personal Coping, measures an individual’s self-rated confidence in executing coping strategies independently, without external help. This primarily consisted of cognitive coping strategies aimed at problem-solving and controlling emotional responses to stressors. Compared to the original factor structure by Chesney et al. (2006), items from the original “Use problem-focused coping” and “Stop unpleasant emotions and thoughts” were merged into this factor.

The second factor, Social Coping, measures an individual's self-rated confidence in executing coping strategies that involve seeking help or support from their social network. The only item that did not fit well was "Visualize a pleasant activity or place," a method of self-distraction that could be performed independently. This item was not retained in the final factor structure of the original tool (Chesney et al., 2006). Conversely, "Get emotional support from friends and family" failed to achieve sufficient factor loading for both factors in this study. This item was previously part of the "Get support from friends and family" factor in the original tool.

The factor structure of the CSES-My suggested that coping self-efficacy among the current sample of parents was differentiated by whether the coping behaviors could be carried out independently (i.e., personal coping) or required social participation (i.e., social coping). This aligns with previous classifications of coping methods into social versus solitary methods (Latack & Havlovic, 1992; Skinner et al., 2003). Although some items, such as "Develop new hobbies and recreation" and "Visualize a pleasant activity or place," may appear to be solitary coping methods, they indicate the individual's inclination towards social activities that may serve as positive distractions from their stressors.

Item CSES4, "Get emotional support from friends and family," had low factor loadings for both factors, with a higher loading for Personal Coping (0.426) than Social Coping (0.180). Researchers use different cut-off values for factor loadings, ranging from 0.30 to 0.71 (Tabachnick & Fidell, 2013; Watkins, 2018). If a cut-off of 0.40 were used, this item would have significantly loaded into Personal Coping. However, qualitative examination suggests that this item should appropriately belong to Social Coping instead of Personal Coping. It is important to note that when determining an appropriate factor solution, there should be no complex or cross-loadings, and all factors should be theoretically meaningful (Watkins, 2018). Therefore, conducting CFA on all 26 items with a new sample is recommended to confirm whether this item should be retained under Personal or Social Coping. Using the recommended cut-off of 0.512, which is appropriate for the current sample size (Field, 2009), avoiding the issue of cross-loading.

Table 6 shows the comparison between the factor structure of the CSES-My and other language versions. It is evident that the factor structure of the CSES varied across different language versions and populations, supporting the need to explore the factor structure for new language versions and different populations.

Table 6 Comparison between the factor structure of the CSES-My and other language versions

Language Version	Population	Analysis	Factor Structure
English (Chesney et al., 2006)	HIV-seropositive men who have sex with men (MSM) with depressed mood in the United States of America	EFA & CFA	Three factors: <ul style="list-style-type: none"> • Use problem-focused coping (6 items) • Stop unpleasant emotions and thoughts (4 items) • Get support from friends and family (3 items)
English (Cunningham et al., 2020)	Military service members in mental health or substance abuse treatment	CFA	Three factors: <ul style="list-style-type: none"> • Problem-focused coping (6 items) • Thought-stopping (4 items) • Getting social support (3 items)
English (Colodro et al., 2010)	Adults living in a British community	EFA	Three factors: <ul style="list-style-type: none"> • Use of problem-focused coping (12 items) • Stop unpleasant emotions and thoughts (8 items) • Get support from friends and family (6 items)
Farsi (Tol et al., 2014)	Iranian patients with type 2 diabetes mellitus	EFA	Four factors: <ul style="list-style-type: none"> • Stop unpleasant emotions and thoughts about diabetes (10 items) • Use problem-focused coping (5 items) • Self-efficacy on diabetes problem solving (5 items) • Get support from friends and family (4 items)
Farsi (Mahmoudi et al., 2015)	Iranian patients with HIV infection	CFA	Three factors: <ul style="list-style-type: none"> • Use problem-focused coping (7 items) • Stop unpleasant emotions and thoughts (5 items) • Get support from friends and family (4 items)
Vietnamese (Tran et al., 2022)	Grade 10 students from Hanoi, Vietnam	EFA	Three factors: <ul style="list-style-type: none"> • Emotion-focused (9 items) • Problem-focused (10 items) • Social support (5 items)
Malay (Current study)	Parents of children with leukemia or lymphoma	EFA	Two factors: <ul style="list-style-type: none"> • Personal coping (19 items) • Social coping (6 items)

The results of this study showed that the 25-item Malay version of the Coping Self-Efficacy Scale (CSES-My) demonstrated good linguistic and structural validity and internal consistency reliability. The difference in factor structure may reflect cultural influences on coping. Malaysia, like many other Southeast Asian countries, has a traditionally

collectivist culture (Hofstede, 2001). Important decisions and events are often faced with close social circles, such as family members, friends, and the community. However, with urbanization, individualism is becoming more common. This shift likely contributed to the distinction between personal and social coping, which is evident in the results of the EFA.

Using the CSES-My could help identify parents' tendencies toward personal or social coping behaviors. Parents who are more confident in personal coping could benefit from various problem-solving or cognitive intervention strategies, whereas those who are more confident in social coping could benefit from identifying resources within their social network. This would help individualize the coping support provided to parents of children with hematological cancers. This hypothesis could be explored through future studies in this population. The original author of the CSES recommended using all 26 items in studies measuring coping self-efficacy (Chesney et al., 2006). The factor structure obtained from this study can be used to derive meaningful scores when researchers wish to study coping self-efficacy specifically related to Personal Coping and Social Coping.

Strengths and Limitations

This study reports the linguistic validation of a newly translated Malay version of the Coping Self-Efficacy Scale (CSES-My). It is also the first to test the CSES-My among parents of children with leukemia or lymphoma, with a broad sample of parents, including those whose children were still receiving treatment and those whose children had completed treatment.

However, several limitations of the study require discussion. Firstly, the CSES-My was only administered once, so test-retest reliability was unavailable. This could be tested in future studies. Secondly, the present study focused solely on evaluating the linguistic and construct validity of the CSES-My. Future research endeavors may investigate its predictive validity in relation to the quality of life. It is recommended that the current factor structure of the CSES-My be verified using CFA in a separate sample of respondents. CFA was not conducted using the same dataset to avoid overfitting (Fokkema & Greiff, 2017).

Secondly, both online and face-to-face data collection methods were used to increase the number of samples recruited for this study, considering partial restrictions posed by the COVID-19 pandemic. While online methods provided a cheap and convenient way to gather data from potential participants without geographical restrictions, they only sampled parents with access to the internet and basic digital literacy. The poor response rate for online questionnaires could be attributed to the proliferation of such surveys during the COVID-19 pandemic. The characteristics of parents who declined to participate in online questionnaires could not be determined. Face-to-face methods allowed for a better response rate as the parents could receive verbal explanations regarding the study. However, this approach was more labor-intensive and slower, as data collection could only be done during clinic and daycare operating hours.

Implications for Practice

Parents of children with cancer may employ coping strategies, which can be categorized into two main groups: personal coping and social coping. Personal coping methods include seeking information, problem-solving, and prayer (Banerjee et al., 2011; Norberg et al., 2005; Polizzi et al., 2015; Tan et al., 2020). Social coping methods include emotional expression and seeking social support (Deribe et al., 2023; Norberg et al., 2005; Tan et al., 2020). Each parent's self-efficacy levels may vary across these coping-method categories, reflecting their

confidence in effectively utilizing each approach. This self-efficacy significantly influences the choice of coping method when dealing with different stressors, emphasizing the importance of considering both personal and social coping approaches in understanding how parents manage stress in this context.

To help parents of children diagnosed with leukemia or lymphoma in the local community cope with stress, a multifaceted approach involving both personal coping and social coping strategies is recommended. The CSES-My facilitates the assessment of general coping self-efficacy among Malaysian parents, including its various factors. This tool is valuable for nurses in discerning an individual's inclination toward specific coping methods. According to Bandura's theory (Bandura, 1978), self-efficacy precedes behavior, suggesting that individuals with higher self-efficacy in certain coping strategies are more likely to have corresponding coping behaviors during stressful situations. By identifying these tendencies, nurses can support individuals by promoting effective coping behaviors and providing training in additional coping strategies.

Furthermore, the CSES-My can be used to develop and evaluate coping interventions tailored for the Malaysian population. Its generality makes it suitable for use with patients or caregivers across different disease conditions. However, it is essential to reassess the reliability and structural validity when applying the CSES-My to diverse populations.

Conclusion

The CSES-My is a valid and reliable tool for measuring self-efficacy in coping with stressful situations among Malaysian parents of children with leukemia and lymphoma. The tool has potential for future research on coping and designing interventions targeting personal and social coping behaviors in Malaysia. It can be used to identify an individual's current coping self-efficacy and to suggest potential coping skills training. By combining both personal and social coping strategies, local communities can create a supportive environment that helps parents better navigate the challenges associated with their child's leukemia or lymphoma diagnosis.

Declaration of Conflicting Interest

CET was a PhD student under the supervision of KAT and SMS during this study. The authors declare no financial competing interests in the preparation of this manuscript. The funder was not involved in the design or conduct of the study.

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Authors' Contributions

CET and SMS conceptualized the study. CET, KAT, and SMS planned the methodology. SCDL secured funding for the study. CET collected the data with support from SCDL and KHT. SMS provided supervision. CET and KAT analyzed the data and drafted the original manuscript. All authors reviewed and approved the final manuscript.

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Data Availability

The datasets supporting the results of this study are available from the corresponding author upon reasonable request.

Declaration of Use of AI in Scientific Writing

The authors did not use any generative AI or AI-assisted technologies in the writing process of this manuscript.

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