Research Article

Participation in Childhood Occupations for 6 to10 years old children – The translation and psychometric evaluations of the PICO Malay version

Siew Yim Loh [1], Su Im Ee [2], Mary J. Marret [3], Mahmood Danaee [4]

Author's Affiliation:
1- Department of Rehabilitation Medicine, University of Malaya
2- Women and Children Hospital, Kuala Lumpur
3- Department of Paediatrics, University of Malaya
4- Department of Social Preventive Medicine, University of Malaya
Correspondence:
Siew Yim Loh, Email: syloh@um.edu.my

Received on: 16-Apr-2021 Accepted for Publication: 10-Jun-2021

ABSTRACT

Background: This study is on the robust validation of the Malay version 'Participation in Childhood Occupation' - a tool for measuring 'limitations in participation' which is an important social determinant of occupational functioning in 6-10 years old children.

Methods: Standard forward-backward translations were conducted to translate the PICO (English version) to PICO-M (Malay version) by bilingual language experts, and reviewed by a panel of 10 expert working in the area of paediatric. A pilot test (30 parents) for test-retest reliability check and content validation. Data were collected (347 parents of healthy 6-10 years old children) using the new PICO_M, and analysed for factor analyses. Both exploratory (n=100), and confirmatory (n=247) factor analyses were conducted to examine the variances attributable to its latent construct and to test the hypothesised 3-factor model.

Results: The psychometric analyses of PICO_M was tested robustly with consideration of its three dimensions of participation - i) difficulties in performance, ii) frequency of performance and iii) enjoyment in performing of the activity being measured. Confirmatory factor Analyses on its latent variables confirmed PICO-M as a modified 3-factor model (Academic, Activities of Daily living, & Play-leisure/Social skill/Habits-routine), with a high composite reliability (CR) for items (ranging between 0.850 and 0.919) and with good discriminant validity.

Conclusions: PICO_M is a valid tool for measuring the pattern of limitation in participation among 6-10 years old children. It is robustly tested as a modified 3-factor instrument. Children with participation-limitations should be screened with PICO-M for earlier detection of functional difficulties, to initiate earlier therapeutic intervention in partnership with the parents.

Keywords: Participation, Cross-cultural Adaptation, Psychometric, PICO_M, Measurement

INTRODUCTION

Children with disabilities has limited activity-participation, recognised as risk factors affecting their functional performances, independence and quality of life (Law, 2002; Cahill et al, 2020; Beisbier & Laverdure 2020). Activity-participations in children are influenced by factors related to the person, everyday occupation, and the environment with impact on health (WFOT, 2016). The concept on activity participation has been expanded by the International Classification of Functioning or the ICF Model (WHO 2007; Belarmino 2018). In the ICF model, functioning and disabilities are conceptualised as multidimensional concepts, which also includes two other important elements - i) *activitie*s of human and the activity limitations being experienced (at the level of individual); and, ii) *participation* of human in all aspects of life with participation restriction experienced (as a member of society). These factors, together with personal and environmental factors, interact in a dynamic mode to influence the level of functioning of the children.

In paediatric care, early detection of activity-limitation and participation-restrictions being risk factors for dysfunctions which impact children's health and wellbeing are emerging outcomes for health. One of the few occupational-based standardized tool to comprehensively measure a child's overall participation is the Participation in Childhood Occupations or PICO (Bar-Shalita et al, 2009). PICO is commonly used by

occupational therapists and it measures three participation scales (***level of activity performance***, ***level of enjoyment of the activity*** and ***frequency of performance of the activity***), to help identify the dimension of participation issues, in order to inform intervention plan to facilitate their participation. Therapy practitioners treating children with disabilities in Malaysia have relied on their own interpretations when using the PICO on Malay-speaking parents, which may be unreliable and inaccurate. There is a need to develop a psychometrically-sound measure for effective clinical practice but also for research and cross-cultural comparisons. Thus, this paper describes the translation and cultural-adaptation of the PICO into Malay for use with Malaysian populations, and to confirm its psychometric (reliability, content validity and construct validity) properties of the PIC0-M version among Malaysian.

METHODS

Design

This is a 2-phased cross-sectional study involving a rigorous translation (from its original English version to a Malay version, and a pilot study in Phase 1. The robust psychometric validation was then conducted using Exploratory factor analysis (EFA) followed by Confirmatory factor analysis (CFA) in Phase 2. The ethical approval for this study was from the Medical Ethics Committee, University of Malaya Medical Centre. The permission to contact the parents of children (via database of 6 to 10 years old healthy children, attending kindergartens/schools) was obtained from the Ministry of Education. We recruited these parents through the Principals-in-charge of the schools/kindergartens. Permission to use the original PICO-Q 2nd edition was provided by the developer of PICO (Tami Bar-Shalita et al., 2009).

Instrument

Demographic and PICO Questionnaires

A demographic and child profile questionnaire was used to gather background data about the participants (e.g. age/gender of child; ethnicity, occupation of parents). *The* **Participation in Childhood Occupations (** *PICO)* (Bar-Shalita et al., 2009), was a 30 item questionnaire (for caregivers), with five areas of functional activities: (1) personal activities of daily living, (2) academic activities, (3) play and leisure, and (4) Social skill (5) habits and routines and 2 general questionnaires. Every item in the tool describes an activity that is scored according to three different scales: (1) *level of activity* performance, (2) *level of enjoyment* of the activity, and (3) *frequency of performance* of the activity, using a 5-point Likert scales parents are asked to provide a rating for each of the three scales.

The PICO tool gives therapist a comprehensive pattern of *activity-participation-restriction*, describing it in detail with coverage on the level of activity, frequency and enjoyment. A total score was calculated for each of the three individual scales, so there were three total scores. PICO has good reliability (Cronbach's alpha 0.86–0.89), test–retest co-efficient (r=0.69–0.86). Prior to data analysis the score of all 30 items of PICO were calculated, using the total score of the three dimensions of measurement (i.e., the level of difficulty, frequency and enjoyment). This was in consideration of the process of evaluation on each child's overall participation, as assessed with the Participation in Childhood Occupations where all these dimensions are involved, to give a total score for each item – for a robust psychometric assessment.

Data collection and finding: Phase 1a (Translation, Cross-cultural Adaptation)

The original English version of PICO was translated into the Malay language and the process followed a stringent guideline (Beaton, Bombardier, Guillemin, & Ferraz, 2000; Sousa & Rojjanasrirat, 2011). Forward and backward translation was simultaneously carried out by two pairs of independent bilingual translators from non-medical backgrounds. This is to ensure that the wordings used are fit for lay persons and not the use of medical jargons. The backward translators were blind to the original English version of the PICO. Upon the returned of the two versions, they were further evaluated by a panel of 10 health experts for further cross-cultural adaption to maintain its content-meaning, with considerations of localised context relevancy (versus a direct word to word translations). Thus, the panel were instructed to check for semantic, idiomatic, and conceptual equivalence on the PICO-Malay draft (and were provided with the English version, for cross checking). This panel consisted

of four bilingual native speakers of Malay, one language expert; three bilingual-speaking therapists and a bilingual-speaking pediatrician. The findings from the group were then proof-read by a native Malay-speaking lecturer (who is also a parent). These processes were aimed to reach a final, harmonised version of a 30-item PICO-M.

Pilot-testing and findings

This step was conducted with 10 experts for content, and then piloted on 30 parent participants as described below. We recruited 10 therapists who consented and provided them with the PICO_M to validate the content. The inclusion criteria included, being proficient in Malay language, has at least 3 years of working experience in the field of pediatrics. The sample size for expert panel of 3 to 10 members was recommended by Lynn (1986). The member individually rated each item as "clear" or "unclear", and if unclear, gave suggestions to improve its clarity. They then rated every item with a 4-point scale from a rating of 1 (not relevant) to 4(very relevant) (Davis L.L., 1992). A mean score was calculated for each of the 30 items and all items were above 4 with a few rated as '3'. Thus, we concluded that the 30-item PICO-M tool was acceptable, for examining child activities and participation in a variety of environment, with a focus on i) the level of difficulty in participant, ii) the frequency and iii) the enjoyment in participation.

A pilot on 30 consented parents were recruited based on inclusions criteria which included, -Malay-speaking parents of various ethnicities, living with a child aged 6 to 10 years old -with **no medical conditions** associated with developmental problems (e.g., attention deficit hyperactivity disorder, Down syndrome, cerebral palsy). These criteria ensured that only parent with 'healthy' children were recruited. This sample size of 30 were based on the recommendation of Beaton et al.(2000). The 30-parent participants were given the PICO-M to comment on words/sentences that were unclear to them, and a brief interview was held with those parents who had issues with the content of PICO-M. This final step of a robust translation check resulted in a PICO-M which meet health literacy principle to ensure it would be easily understood in the community.

Data collection for Psychometric CFA testing of PICO-M

Data were collected from **316** parents of typically developing, 6-10 years old children. These parents were recruited (through the principals/teachers of six kindergartens/primary schools around Kuala Lumpur), based on inclusion criteria which included - (a) parent of typically developing children, aged 6 to 10 years old. (b) no medical condition/s of delayed development (e.g. attention deficit hyperactivity disorder, Down syndrome, cerebral palsy or autism), and (c)able to speak read and understand Malay language. Parents who agreed to participate signed the consent form and completed a questionnaire on demographic profile and the PICO-M. The sample size was calculated based on Hair et al (2010)'s recommendation for handling more than 12 observed variables (items) for a sample size of 250.

Data analysis

Descriptive statistics such as mean, standard deviation, and frequencies were applied to explore the research variables.

Exploratory Factor Analysis

Eigenvalue exceeding 1(Kaiser criterion) were used to determine the factor to retain, while, Bartlett's test of sphericity should be statistically significant at $p < .05$ and the Kaiser-Meyer-Olkin value should be ≥ 0.5 for factor analysis to be suitable in term of measure of sampling adequacy (Hair, Anderson, Tatham, and Black, 1998; Tabachnick, and Fidell, 2007;Hutcheson, & Sofronia, 1999)

Parallel analysis

Parallel analysis (PA) is a method used to define the number of factors in a factor analysis. Parallel Analysis is a Monte Carlo simulation method that helps scholars in defining the number of factors to retain in Principal Component and Exploratory Factor Analysis. This technique delivers a superior technique, different to other techniques that are generally used for the same purpose, such as the Scree test or the Kaiser's eigen value-greater-than-one rule. in this study the parallel analysis was done based on this method using online software for PA (www.statatoddo.com).

Confirmatory Factor Analysis (CFA)

Smart-PLS ver3 was used to examine the construct validity and goodness of fit indices (Tabachnick & Fidell, 2007), to confirm the latent factor of the 30-item PICO-M. The measurement model was evaluated for both convergent and discriminant validity. Factor loadings of construct, average variance extracted (AVE), and construct reliability (CR) estimation are used to assess the convergent validity of each of the constructs (Hair et al., 2010). Composite reliability were calculated from factor loadings for more precise estimates of reliability than those provided by α (Geldhof, Preacher, & Zyphur, 2014). Based on Hair Jr et al. (2016) recommendation, the Fornell-Larcker criterion, cross-loadings, and also the heterotrait-monotrait (HTMT) ratio of correlations were used to examine the discriminant validity to ensure a robust examination.

Table 1: Demographic of Respondents (316 parents) for factor analysis (EFA,CFA) of PICO-M

Characteristics	EFA (n=150)		CFA(n=166)	
	n	%	n	%
RESPONDENT				
Father	46	30.7	60	36.1
Mother	99	66.0	105	63.3
Other	5	3.3	1	0.6
PARENT (AGE)				
Below 21	2	1.3	2	1.2
21-30 years old	7	4.7	7	4.2
31-40 years old	93	62	98	59
41-50 years old	41	27.3	52	31.3
Above 50	7	4.7	7	4.2
Race				
Malay	137	91.3	142	85.5
Chinese	6	4.0	13	7.8
Indian &others	7	4.7	11	6.6
Highest level of Education				
Primary-lower secondary	11	7.3	10	6.0
Upper secondary- Diploma	90	60.0	103	62.0
Degree/Master/PHD	49	32.7	53	31.9
CHILD (AGE)				
6 years old	21	14.0	15	9.0
7 years old	41	27.3	43	25.9
8 years old	19	12.7	47	28.3
9 years old	30	20.0	34	20.5
10 years old	39	26.0	27	16.3
Gender				
Boy	59	39.3	68	41.0
Girl	91	60.7	98	59.0

RESULT

Phase 1 (The Content verification and validation)

The panel of 10 expert reviewed the content of PICO-M for proper semantic of language usage. Only minor changes were made to improve clarity. For examples "camping, bowling" were added into item 19 for context-relevance activities, while the term "sport activities" was replaced with "recreational activities" (item 20). In Malaysian culture, the term "sport" typically refers to activities such as football, badminton, tennis, which our children of 7 years and below would mostly not participate in them. With content-related checking, the inter-rater agreement among the 10 experts for most items were excellent at 80-100%. This is supported by evidence that the minimum inter-ratter agreement among the experts for clarity should be set at above 80 percent (Topf, 1986), or where experts gave a rating 3 or 4 " (Beck, CT. & Gable, 2001; Lynn, 1986). Only three items (item 9, 29 and 30) had an interrater agreement at 60 percent. The phrase in item 9 "pergerakan dalam persekitaran

terdekat", ("movement in the near environment") was substituted with "Pergerakan dalam persekitaran sekeliling" (which means "Mobility in surrounding environment") for better context relevance. The content validation by experts were performed by calculating the content validity index (CVI) at the item level (I-CVI) and at the scale level (S-CVI). The results showed I-CVI at 0.97 and S-CVI/Ave was 0.97. This is acceptable per the recommended I-CVI of between the value of 0 and 1 (Lynn, 1986).

Phase 2 Result Pilot Study (The Dimensionality Analysis)

I) Demographics

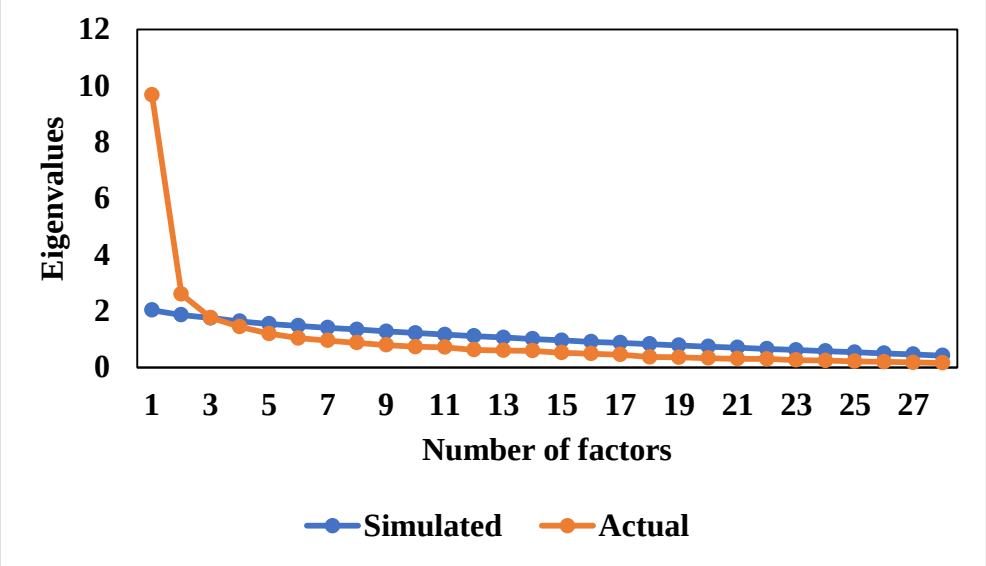
Only completed forms and questionnaires were included in the data analysis. The sample consisted of **316 typical developing children**. The samples size for Exploratory factor analyses (EFA) and Confirmatory factor analyses (CFA) **were 150 and 166** respondents respectively. Table 1 is the demographic of the parents. Most parents (71%) had completed secondary education or had a diploma. The children were aged between 6 and 10 years old (mean= 8.07, SD 1.316) and 60 percent were girls.

II) Exploratory Factor Analysis

Parallel analysis

The parallel analysis (Figure 1) indicated that the eigenvalue for the third extracted factor was nearly equal to the eigenvalue that could be expected by chance ($\lambda = 1.756$). The results of this parallel analysis indicate that only three factors have eigenvalues greater than what can be expected by chance and suggest that three factors can be extracted from the data and therefore in the next step for exploratory factor analysis the number of extracted components is considered as three factors.

Figure1: Scree plot and parallel analysis for items related to knowledge



Exploratory Factor Analysis

Exploratory Factor Analysis was applied to determine the factor structure among 28 aggregated items related to PICO. Several well-known criteria for the factorability of a correlation were used. Firstly, the Kaiser-Meyer-Olkin measure which is related to sampling adequacy which was 0.877, and above the suggested value of .6, and Bartlett's test of sphericity was significant ($\chi 2$ (378) = 2126.2, $p < 0.05$) . In the current study, all initial communalities were above the threshold and all loading factors were above 0.4. The EFA was done based on results of parallel analysis and the number of components was considered according to these results as three components. The eigenvalues and total variance explained by the three factors is shown in (Table 2). The results

after Varimax rotation showed that the first factor is related to "Leisure-play, Social Skills and habits" and explained 22.48 % of the variance (which comprises of **15 items).** Although habits and routine had low eigenvalues , these were added in because they were deemed highly characteristic of autism behaviour. The second factor with 9 items was related to "Daily Care "17.29% of the variance. Result of factor analysis indicated that the third component with 4 items was related to "Academic" with explaining of 10.38% of the variance. Total variance explained by these three components was 50.164% which was greater than the recommended value of 50% as a general rule (Streiner, 1994; Centre for academic success, 2017).

Table 2 Factor Loadings and Mean score of 28 items of the PICO-M (n=150) from EFA

	Component		
	1	2	3
PIC23	0.788		
PIC24	0.764		
PIC26	0.757		
PIC25	0.719		
PIC20	0.702		
PIC19	0.652		
PIC21	0.642		
PIC9	0.613		
PIC8	0.575		
PIC18	0.566		
PIC13	0.544		
PIC22	0.506		
PIC10	0.441		
PIC27	0.325*		
PIC28	0.241*		
PIC2		0.737	
PIC4		0.736	
PIC5		0.698	
PIC1		0.697	
PIC3		0.691	
PIC7		0.618	
PIC6		0.605	
PIC11		0.462	
PIC12		0.452	
PIC15			0.847
PIC16			0.731
PIC14			0.705
PIC17			0.436
Eigenvalues	6.297	4.842	2.907
% of Variance	22.488	17.294	10.381

** These two items (27 & 28) were kept in the model due to expert's recommendation*
Factor1=(Play-leisure, Social-skill, Routine-habit); Factor2: (activities of daily living); Factor 3=(academic)

I) Confirmatory Factor Analysis- PICO-M

Using PLS-SEM the measurement model of PICO-M that was tested to contain 28 based on the results of EFA and applying 3 factor model – Academic, Daily Care and Play-leisure/Social-skill/Routine-habits. Figure 2 showed the **CFA of the modified 3-Factor Model of PICO-M.** Table 3 below shows the outer loadings of all items for all construct in initial and modified measurement model. According to these results all outer loadings except the one item (PIC8) related to "Leisure & Social Skills" subdomain which was deleted from initial measurement model due to low loading factor (less than 0.5) all other items showed an acceptable loading

factor (>0.5). The convergent validity of the constructs can be assessed by examining the average variance extracted (AVE), which attempts to measure the amount of variance that a latent variable component took from its indicators relative to the amount because of measurement. Average Variance Extracted (AVE) is higher than 0.5 but we can accept 0.4. Fornell and Larcker(1981) said that if AVE is less than 0.5, but composite reliability is higher than 0.6, the convergent validity of the construct is still adequate (Fornell & Larcker, 1981) In this study the AVE ranged between 0.451 to 0.588 which indicated adequate convergent validity (>0.4) for all constructs. Composite Reliability (CR) larger than 0.7 is acceptable (Hair et al 2010). As shown in Table 3, composite reliability for each construct is above the 0.7 threshold and are considered good index for reliability (Segars, 1997). The Composite Reliability (CR) for these items ranged between 0.850 and 0.919.

Table 3: The Result of Convergent Validity and reliability

Construct	Item	Loading		Cronbach's Alpha	CR	AVE
		Initial model	Modified model			
Academic	PIC17	0.631	0.631	0.76	0.85	0.588
	PIC14	0.769	0.769			
	PIC15	0.812	0.812			
	PIC16	0.839	0.839			
Daily Care	PIC6	0.566	0.566	0.853	0.885	0.464
	PIC7	0.596	0.596			
	PIC3	0.651	0.651			
	PIC12	0.666	0.666			
	PIC11	0.672	0.672			
	PIC1	0.685	0.685			
	PIC4	0.699	0.699			
	PIC2	0.752	0.753			
	PIC5	0.81	0.81			
Play-leisure, Social-skills, Routines-habits	PIC8	0.387	deleted	0.904	0.919	0.451
	PIC28	0.502	0.508			
	PIC13	0.54	0.537			
	PIC10	0.572	0.564			
	PIC21	0.613	0.61			
	PIC27	0.613	0.615			
	PIC26	0.631	0.637			
	PIC9	0.644	0.639			
	PIC18	0.69	0.688			
	PIC19	0.706	0.706			
	PIC22	0.713	0.717			
	PIC20	0.726	0.729			
	PIC24	0.752	0.759			
	PIC25	0.797	0.802			
	PIC23	0.802	0.805			

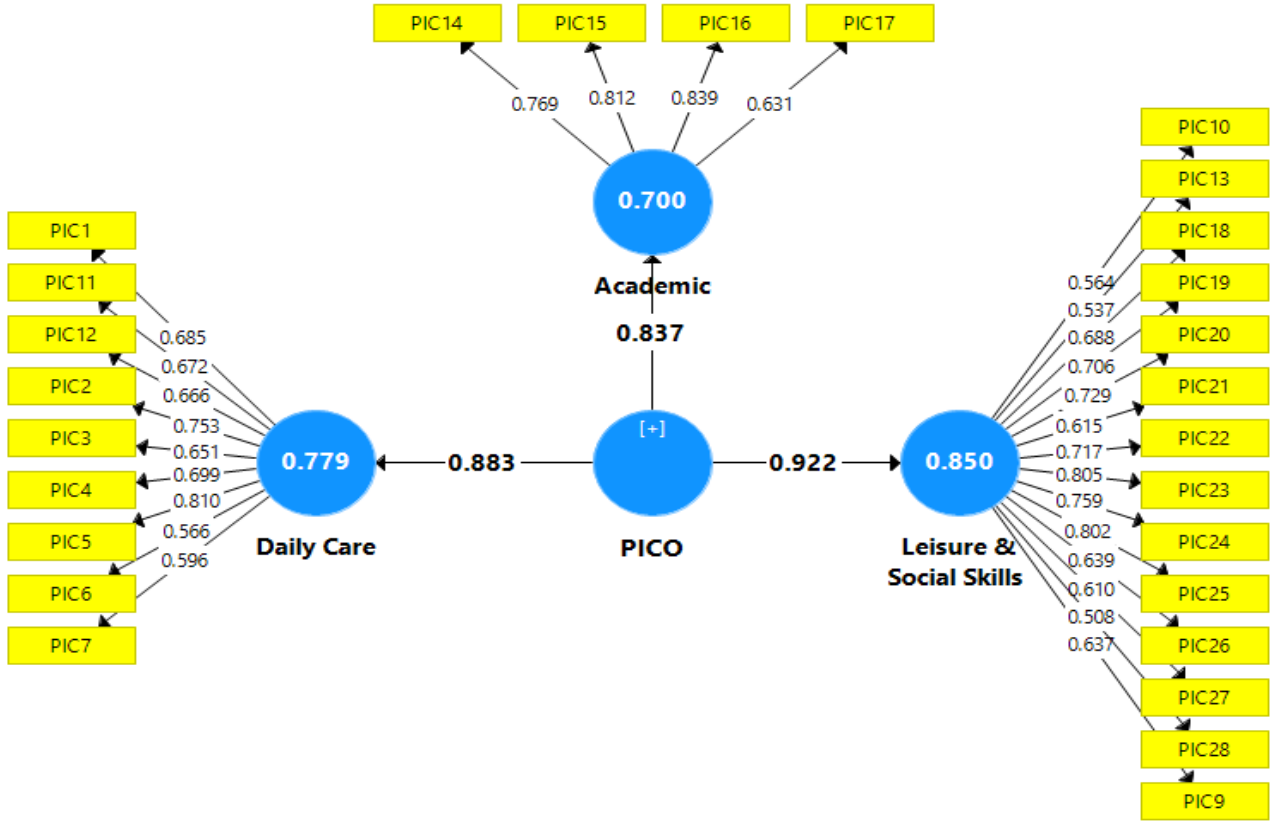
Discriminant validity

Discriminant validity is well-defined once a construct is appropriately different from other constructs by observed standards. Discriminant validity can be asessed by three different methods including Fornell Larcker's (1981) criterion, Hetrotrait-Monotrait ratio of correlations) criterion and cross loading criterion. Hair et al. (2010) recommended that the HTMT value must be less than 0.85. Table 4 reveals the HTMT values for all of the constructs in this research. Thus, the constructs showed sufficient discriminant validity.

Table 4 Correlations of latent constructs and discriminant validity (HTMT method)

3- Factors	Academic	Daily Care	Leisure-Social-skills-Habits-routines
Academic			
Daily Care	0.882		
Play-leisure, Social-skills, habit-routine	0.797	0.771	

Figure 2: The CFA of the modified 3-Factor Model of PICO-M



DISCUSSION

This paper presents the language translation, content-validation and factor analyses of the PICO-M for use in Malaysia. A stringent process of forward-backward translation, expert-panel reviewed of content and psychometric assessment using EFA followed by CFA were conducted to produce a culturally-sound PICO-M. The language assessment was robust based on an established guideline (Beaton et al., 2000; Guillemin et al., 1993; Sousa & Rojjanasrirat, 2011). This ensure that the sematic, idiomatic, conceptual-equivalence and cultural applicability of every items in PICO-M was evaluated for a Malaysian context. Some amendments were made to items for local context relevancy (eg. item 20) to the cultural considerations of Malaysians. Four out of ten experts suggested the removal of items 29 and 30 because of poor clarity. The kappa of intra-rater agreement was 0.60, the minimum acceptance value (Sousa & Rojjanasrirat, 2011). Thus, both (items 29 and 30) were dropped. This study followed a robust procedure where after translation, the 28-items PICO-M were piloted on 30 (parent) participants. These participants commented that the items were clear and they rated the PICO-M with their children in mind (Brislin, Lonner, & Thorndike, 1973). Cicchetti, (1994) provide a guideline for the interclass correlation coefficient where the value <.40 is poor, 0.40 to 0.59 is fair, 0.60 to0.74 is good and 0.75 to 1.00 is excellence]. Based on the guideline, the Cronbach's alpha of the PICO-M showed good value (0.60 - 0.80) for all three scales, indicating that it is a reliable tool to measure activity-participation among children. CFA results suggest PICO-M as a 1-factor tool. Its latent variables are firmly grounded in the ICF theoretical framework for measuring activities and participation comprehensively – ie taking into consideration the level/extend of involvement, the satisfaction/enjoyment and the difficulty of activity (Phillips, Olds, Boshoff, & Lane, 2013). The goodness-of- fit indices of the PICO-M 1-factor model was acceptable and 25 items were

retained. The study confirm that the 1-factor model PICO-M is reliable and valid for use to assess Malaysian children.

This is the first validation study for a PICO-M, a relatively large sample of Malay-speaking parents in Malaysia. The stringent translation steps ensure that the final PICO-Malay version is grammatically and culturally correct, easy to read, no medical jargons and with basic health literacy consideration. The careful forward and backward translation, cultural adaptations, with a final translation of the PICO-M draft back into English by a professional translator ensure that all translations are valid and reliable to the original English version. Additionally, the robust SPSS analyses on CFA on the PICO-M, resulted in a useful valid and reliable screening tool, enable therapists (clinician and researchers) to assess Malay-speaking parents. As the ability to participate in occupation is an important outcome of rehabilitation interventions (Yu, Desha, Ziviani, 2013; Little, Sideris, Ausderau, Baranek 2014), and a very important indicator of quality of life (WHO, 2007), we recommend that further studies to be conducted on a larger cohort of Malaysian children, sampling from not just urban but also rural area and to include children with cluster of specific-disabilities to study on their distinct or shared pattern of participation to highlight risk factors, to ensure greater representation.

CONCLUSION

The PICO-M is a culturally-tested, valid and reliable tool to examine the activities participation in children. Our psychometric finding supports the single-factor structure of the PICO-M as a well-constructed tool for used on Malaysian children aged 6 to 10 years, to examine their activities participation. The three dimensions of participation, in term of i) difficulties in performance, ii) frequency of performance and iii) enjoyment in the performing the activity are measured, and considered in the psychometric analyses. Therefore, PICO-M address the assessment tool deficits, due to the lack of valid tool in the peadiatric clinical practice in Malaysia. Thus, this PICO-M tool is a potentially beneficial tool for both clinicians and researchers in their client-centered practice, and working in partnership with parents to improve childhood participation. It will be useful in enabling occupational therapists to further research on activity limitations - a social determinant and risk factor for the promotion of function and health of children. In conclusion, the development of the PICO-M with good psychometrics, ensures a ready-tool to examine prticipation that could be applied in clinical practice in Malaysia, thereby facilitating an earlier confirmation of 'limitation-in-participation' dysfunctions in children (6-10 years old), and paving the way for early intervention.

FUNDING

This study was funded by a small postgraduate research grant University of Malaya (Grant number: PG090-2013A)

REFERENCES

1. Law, M. (2002). Participation in the Occupations of Everyday Life. American Journal of Occupational Therapy, 56(6), 640–649.
2. Beisbier S & Laverdure P (2020) Occupation- and Activity-Based Interventions to Improve Performance of Instrumental Activities of daily Living and Rest and Sleep for Children and Youth Ages 5–21: A Systematic Review Am J Occup Ther. 74(2):7402180040. https://doi.org/10.5014/ajot.2020.039636
3. Cahill SM, Egan BE & Seber J (2020) Activity - and Occupation-Based Interventions to Support Mental Health, Positive Behavior, and Social participation for Children and Youth: A Systematic Review American Journal of Occupational Therapy, March, Vol. 74, 7402180020. https://doi.org/10.5014/ajot.2020.038687
4. WFOT. (2016). Occuaptional therapy services in school based practice for children and youth -position statements 2016 Available at https://www.wfot.org/resources
5. Bar-Shalita, T. (2009). The participation in childhood occupations questionnaire (PICO-Q): A pilot study. Physical & Occupational Therapy in Pediatrics, 29(3). doi:10.1080/01942630903028440
6. WHO, 2007 International Classification of Functioning, Disability and health: children & youth version. Available at https://apps.who.int/iris/bitstream/handle/10665/43737/9789241547321_eng.pdf?sequence=1
7. Belarmino J.A. Exploring Use of the International Classification of Functioning, Disability and Health in Pediatric Occupational Therapy Am J Occup Ther. 2018; 72(4_Supplement_1):7211505091. https://doi.org/10.5014/ajot.2018.72S1-PO2014
8. Bar-Shalita, T., Yochman, A., Shapiro-Rihtman, T., Vatine, J.-J., & Parush, S. (2009). The participation in childhood occupations questionnaire (PICO-Q): A pilot study. … & Occupational …, 29(3). doi:10.1080/01942630903028440
9. Beaton, D. E., Bombardier, C., Guillemin, F., & Ferraz, M. B. (2000). Guidelines for the process of cross-cultural adaptation of self-report measures. Spine, 25(24), 3186–91. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/11124735

10. Sousa, V. D., & Rojjanasrirat, W. (2011). Translation, adaptation and validation of instruments or scales for use in cross-cultural health care research: a clear and user-friendly guideline. Journal of Evaluation in Clinical Practice, 17(2), 268–74. doi:10.1111/j.1365-2753.2010.01434.x
11. Lynn, M. R. (1986). Determination and Quantification Of Content Validity. Nursing Research, 35(6), 382–386.
12. Davis L.L. (1992). Instrument review: Getting the most from a panel of experts. Applied Nursing Research, 5(4), 194–197. doi:DOI: http://dx.doi.org/10.1016/S0897-1897(05)80008-4
13. Wang J, Wang X. Structural equation modeling: Applications using Mplus: John Wiley & Sons; 2012
14. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). Multivariate Data Analysis (7 th editi.). Upper Saddle River, NJ: Pearson Prentice Hall.
15. Hutcheson, G. & Sofronia, N. (1999). The Multivariate Social Scientist: Introductory Statistics Using Generalized (First edit.). London.
16. Tabachnick, B. G., & Fidell, L. S. (2007). Using Multivariate Statistics (fifth edit., p. 1 to 963). United state of Amerlca: Pearson Education. Inc.
17. Topf. (1986). Three estimates of interrater reliability for nominal data. Nursing Research, 35(4), 253–255.
18. Lynn, M. R. (1986). Determination and Quantification Of Content Validity. Nursing Research, 35(6), 382–386.
19. Streiner (1994) Figuring out factors: the use and misuse of factor analysis. Canadian Journal of Psychiatry, 39(3), pp. 135-140.
20. Centre for Academic Success (2017), Advice on exploratory factor analyses. Birmingham City University. Available at http://www.open-access.bcu.ac.uk/6076/1/__staff_shares_storage%20500mb_Library_ID112668_Stats%20Advisory_New%20Statistics%20Workshops_18ExploratoryFactorAnalysis_ExploratoryFactorAnalysis4.pdf
21. Fornell, C., & Lacker, D. F. (1981). Structural equation models with unobservable variables and measurement error : algebra and statistic. Journal of Marketing Research, 18(August), 382–388
22. Guillemin, F., Bombardier, C., & Beaton, D. (1993). Cross-cultural adaptation of health-related quality of life measures: literature review and proposed guidelines. Journal of Clinical Epidemiology, 46(12), 1417–32. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/8263569
23. Brislin, R. W., Lonner, W. J., & Thorndike, R. M. (1973). Questionnaire wording and translation. In Cross CuItural Research Methods. (pp. 32–58).
24. Cicchetti, D. V. (1994). Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. Psychological Assessment, 6(4), 284–290. doi:10.1037//1040-3590.6.4.284
25. Phillips, R. L., Olds, T., Boshoff, K., & Lane, A. E. (2013). Measuring activity and participation in children and adolescents with disabilities: a literature review of available instruments. Australian Occupational Therapy Journal, 60(4), 288–300. doi:10.1111/1440-1630.12055
26. World Health Organization (2007) The International Classification of Functioning, Disability and Health, Children and Youth version Geneva: WHO. http://www.who.int/classifications/icf/en/
27. Yu ML, Desha L & Ziviani J (2013) Aspects of Activity Participation as Risk Factors for Conduct Problems in Children and Adolescents: A Literature Review Using Ecological Systems Theory. Journal of Occupational Therapy ion mental health Vol 29 2013 (4)
28. Little, L. M., Sideris, J., Ausderau, K., & Baranek, G. T. (2014). Activity Participation Among Children With Autism Spectrum Disorder. American Journal of Occupational Therapy, 68(2), 177–186.