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TURKISH VALIDITY AND RELIABILITY STUDY OF THE PARENT AND CHILD FORMS OF THE PEDIATRIC PAIN COPING INVENTORY (PEDSQL-PPCI)

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Abstract
Background/Aim: This research was performed to assess the validity and reliability of the "PedsQL-Pediatric Pain Coping Inventory" for use in children and parents in Turkey.
Methods: The study was designed as methodological-descriptive. The sample group of the study was composed of 300 children and mothers. The data were obtained by using the Sociodemographic Questionnaire and "Parent and Child Forms of the PedsQL-Pediatric Pain Coping Inventory (PedsQL-PPCI)."
Results: Cronbach's alpha values for the child and parent forms were 0.82 and 0.89, respectively. The indices of Model Fit for child reports were determined to be RMSA = 0.070, GFI = 0.88 and CFI = 0.91. In the construct validity testing, the KMO value was 0.83 and Bartlett's sphericity test resulted in 4244.75 ($p < .001$) and R2 = 71.97%.

The indices of Model Fit for parent reports were determined to be RMSA = 0.08, GFI = 0.86 and CFI = 0.94. In the construct validity testing, the KMO value was 0.83 and Bartlett's sphericity test resulted in 4973.95 ($p < .001$) and R2 = 66.86%.
Conclusions: Our results showed that the scale is a valid and reliable instrument that can be used as a pediatric pain coping inventory for Turkish parents and children. The PedsQL-PPCI is a convenient tool for professionals in managing and preventing pediatric pain.
Keywords: Pediatric pain, PedsQL-Pediatric Pain Coping Inventory, child, parent, validity, reliability, pain coping

INTRODUCTION

The evaluation of pediatric pain comprises cognitive, affective, behavioral, sociocultural, and environmental factors. Such an evaluation should be made based on a child's development, the child's general condition, the type of surgery performed, the child's illness and his/her ability to define the pain (1). Children older than the age of three can use comprehensible words to describe the localization of the pain, its severity and nature, depending upon the extent of their development. However, younger children or those with intellectual disability may not be able to provide adequate information. Under these circumstances, there are measures based on behavioral and physiological parameters that can be used (2,3,4). The appearance of the face, position of the body, movements, crying, change in patterns of sleep, skin color, as well as many other different behavioral characteristics and physiological changes may be indicative of a child's suffering from pain. Thastum et al.(5) assert that psychosocial factors make a significant contribution to a child's perception of pain and that there might be better predictors of a child's degree of pain than clinical illness activity.

Pain management can be achieved through a conceptual understanding of individual differences and by observing the coping strategies that can be detected in the patient's cognitive-behavioral reactions. When pain evaluation and the methods a oping strategies based on the child's responses to pain (6,7).

In the case of children who are developmentally able to evaluate their pain and the mechanisms of coping with pain, self-reporting is of great importance. On the other hand, the child and family are integral parts of a whole and therefore the family takes a primary role in the care of the child. Because of this, the assessment of pain and coping mechanisms must be carried out by both the child and the parent. Although there are pain assessment tools that are used in the assessment of pediatric pain such as the Modified Behavioral Pain Scale, the Behavioral Pain Scale, Cheops Pain Scale, and FLACC, (7-10) there is as yet no valid and reliable measure in the Turkish literature that can be used to assess pain and mechanisms to cope with pain that address both children and parents.

Pain coping strategies are the cognitive and behavioral responses of patients to manage their pain processes. Coping efforts to relieve or reduce pain may result in success or failure, depending on the patient's mood and adaptation (11-13). Thus, coping is conceptualized as a process mechanism, not as an outcome measure. Studies with pain are generally related to acute and chronic pain. However, studies focusing on coping strategies in pediatric pain seem to be less. In contrast, extensive empirical literature has documented the effect of pain coping strategies on pain and adjustment in adult chronic pain patients. A look into the literature reveals the measure developed by Varni et al.(14) that was designed to assess strategies for coping with pediatric pain.

Materials and methods

The research was designed as methodological and descriptive. The main purpose of designing the research is to test the validity and reliability of the "PedsQL Pediatric Pain Coping Inventory (PPCI)" in Turkish language. Approval for the study was obtained from the university's Ethics Committee (2019-140-31/12) and permission was received from the OB&Gyn and Children's Hospital administration.

1. Participants

The study was conducted with 300 children between the ages of 6-12 and their parents at the Hospital where the children were being treated. The criteria for inclusion in the study were that the Children and parents do not have any barriers to reading comprehension, the children should have presented at the hospital's clinical or outpatient healthy and sick child facilities, be between the ages of 6 and 12, and be fluent in speaking and writing Turkish.

2. Cross-cultural adaptation

The translation/back-translation method was used in testing the language validity of the scale. The inventory was then presented to eight specialists for their opinions. The form that the experts were asked to fill out was drawn up as a four-point Likert scale in line with Polit & Beck's suggestion (17). The CVI value for the content validity of this study was found to be 0.92.

3. Reliability

Reliability methods used for reliability analysis in this study, which are internal handling (homogeneity), two-half reliability and item-total conditions requirements.

4. Validity

Construct and factor validity analyzes were used to test the extent to which what was intended to be measured was measured. Factor analysis determines the sub-factors by gathering the highly correlated variables together.

5. Instruments

Sociodemographic Questionnaire

This investigator-developed questionnaire was used to depict sample characteristics.

PedsQL-Pediatric Pain Coping Inventory (PedsQL-PPCI)

PedsQL, developed by Varni et al.[14], takes its place among a series of pediatric quality of life scales and is used to evaluate strategies for coping with pediatric pain. The questionnaire measures strategies of coping with pediatric pain and assesses both the child and the child's parents. In keeping with this aim, the assessment of coping strategies for pediatric pain is carried out by parents and their child. In both forms of the original measure, there are five subscales: cognitive self-instruction, problem-solving, distraction, seeking social support and catastrophizing/helplessness. Higher scores obtained from the scale indicate that children have more coping skills.

6. Statistical analysis

Factor analysis was used for the validity analysis of the scale. In this analysis, exploratory and confirmatory factor analysis was used. Cronbach's alpha and maximum likelihood method were used to evaluate the internal consistency of the scale.

Results

Participants' Demographic Characteristics

The children's mean age was 9.55 ± 1.47 at an age range of 6-12; the mean age of the mothers was 31.42 ± 4.50, at an age range of 20-45. The mean age of the fathers was 35.22 ± 4.90, at an age range of 26-51. Of the parents, 86% comprised mothers; among the mothers, 59.4% had a secondary education, 32.2% were unemployed. Of the fathers, 42.1% had a secondary education; 36.8% were civil servants.

Validity analysis of the PedsQL-Pediatric Pain Coping Inventory (PedsQL-PPCI)

Item Content Validity Index (I-CVI) and scale CVI (S-CVI) were used for the content validity of the scale.. The CVI value for the eight experts in the form is required to be 0.78 or above (15,16).

The CVI value calculated for each item was between 0.80-0.96, and the CVI value of the scale was calculated as 0.92.

As a result of the EFA for the *PedsQL-PPCI child reports*, the Kaiser Meyer Olkin (KMO) coefficient was found to be 0.830 and Barlett's sphericity test result was $\chi 2 = 4244.748$, $p < .001$. As a result of the EFA for *parent reports*, the KMO coefficient was found to be 0.829 and Bartlett's sphericity test result was $\chi 2 = 4973.952$, $p < .001$.

Seven factors for child reports were detected with eigenvalues of less than 1. The total explained variance rate was 66.86%. The factor loadings were between 0.45-0.62. Six factors for parent reports were detected with eigenvalues of less than 1. The total explained variance rate was 66.86%. The factor loadings were between 0.42-0.85 (Table 1). As a result of the CFA for the *child reports*, factor loadings were between 0.61-0.82. Model compliance indicators were $0.85 \leq GFI = 0.88$, $0.90 \leq NFI = 0.90$, $0.90 \leq CFI = 0.91$, $3 \geq \chi 2 /df = 2.44$, $p < .001$ and $0.08 \geq RMSEA = 0.070$ (Fig. 1). The fit indexes were acceptable and showed a good fit on the child report. When the correlations between the scale and sub-dimensions are examined, the correlation coefficients vary between 0.57-0.82 for all sub-dimensions (Fig. 1).

As a result of the CFA for the *parent reports*, factor loadings were between 0.35-0.82. Model compliance indicators were $0.85 \leq GFI = 0.86$, $0.90 \leq NFI = 0.90$, $0.90 \leq CFI = 0.94$, $3 \geq \chi 2 /df = 3.00$, $p < 0.001$ and $0.08 \geq RMSEA = 0.08$ (Fig. 2). The fit indexes were acceptable and showed a good fit on the parent report. The correlation coefficients between the subscales of the scale were 0.48-0.78 for all factors.

Reliability analysis of PedsQL-PPCI child and parent reports

Tukey's summability test was performed to narrow the additiveness. In addition, split-half reliability analysis was performed by calculating the Spearman-Brown formula and the Guttman Split-half value. Please see Table 2.

Content and construct validity analysis were used for reliability analysis. The total content validity index (CVI) of the scale was obtained as 0.92. Varimax rotation is the most common axis rotation method for orthogonal factor solutions Varimax rotation method, which is widely used in scales used as sub-dimensions, was used for EFA analysis (16,18). As a result of the EFA analysis, it was seen that the child form had seven sub-dimensions with item loads ranging between 0.40-0.82. Cronbach's alpha coefficients for the child reports for each factor were between 0.62-0.85; the total Cronbach's alpha coefficient for child reports was 0.88.

EFA results of parent form, for the seven factors that emerged varied in the range of 0.44-0.86. Cronbach's alpha coefficients for the parent reports for each factor were between 0.62-0.89; the total Cronbach's alpha coefficient for child reports was 0.89.

Discussion

The PedsQL-PPCI is a measurement tool that requires parent and child assessment designed to assess child and parent perceptions of pain coping strategies in situations where the child is experiencing pain. However, when the literature is examined, it is seen that the scale has not been adapted to the Turkish language. As a result of the validity and reliability analysis for the Turkish version of PedsQL-PPCI, it shows that the scale is valid and reliable in the Turkish population. The Turkish version of this study, which was conducted with 7 children and parents in the original version, was conducted with 300 children and their parents.

To test scale validity, a measure is applied simultaneously with another measure that has been developed for the same or similar purpose and has been proved to be valid (19,20). The correlation coefficients between the two scales are assessed. It is accepted that the higher the correlation between the scales, the higher the level of validity of the measure tested (18,20,21).

However, to attain a high correlation coefficient, a comparison needs to be made with another measure on the same subject matter that has already been tested for validity and reliability and can be accepted as a "gold standard." At the same time, it is not always possible to find a measure that can be accepted as a gold standard (20, 22).

Validity analyses of PedsQL-PPCI child and parent reports

Validity and reliability are the two essential properties of a standard scale used to measure concrete or abstract characteristics (17,24). Validity is an indication of what an instrument measures and how correctly it functions as a measure. It is the quality of a measure that deems it capable of using the data obtained for the intended purpose. The basic question to be answered in the context of validity is, "Can the items correctly measure what is meant to be measured in line with our aim?" In exploring validity, the methods of testing content validity, criterion validity and construct validity are used (16,25).

Content and construct validity were explored in this study. Seven factors were determined whose eigenvalues were higher than 1 in the child reports. These seven factors explained 71.96% of the total variance. Since the factor with an eigenvalues greater than 1 was six in the parent reports. These six factors explained 66.86% of the total variance. Values between 40.0-60 are acceptable values for variances 40.0-60.0% (23-25). The original form of the scale comprises 5 factors, an explained variation of 39%, and factor loadings in the range of 0.40-0.71. The total variance in this study was within accepted values. This result shows that the child and parent scales have a strong factor construct.

According to the CFA results of the scales, factor loads of all sub-scales were found to be greater than 0.30 and the fit indexes were higher than 0.90, and the RMSEA value was lower than 0.080 at the same time. According to the results of the fit index, there was a strong correlation between the subscales (Fig.1 and Fig.2). According to the literature, Model compliance indicators should be > 0.90 and RMSA should be < 0.08 (16,18). In our study, CFA results show that the data and the model are compatible with each other and that the scale items adequately explain their own factors. The results of the EFA and CFA in our study support the construct validity of the scale.

Reliability analysis of PedsQL-PPCI child and parent reports

The literature explains that a Cronbach's alpha coefficient between 0.60 and 0.80 shows that a scale is very reliable (16,18). In this study, Cronbach's alpha coefficient for the children's and parents' reports was detected to be 0.88 and 0.89 for the overall scale, respectively. These findings show that Cronbach's alpha values for the overall scale and the first subscale were highly reliable as well as reliable in other subscales. In the original form of the scale, Cronbach's alpha coefficients ranged between 0.67-0.77. The results of this study confirmed the reliability of the scale.

Another method that is recommended for reliability analysis is the test-retest method. The test-retest method explores how much the results of a scale change over time. The same research instrument is applied two or more times to the same participants under the same conditions (19,20). The similarity of measurement results taken at different times points to the consistency of a scale (21,22). The desired circumstance is that the test-retest method indicates no significant or least a very slight difference between any two measurements (18,19). Since the time interval between measurements can affect the interpretation of reliability in a test-retest, it is recommended that the interval between two applications be set at 14-28 days (23,24).

On the other hand, since there can be differences in variables such as the severity of pain, its intensity or its perception depending on factors of time and environment, test-retest analysis was not performed in the validity analysis in this study. Reliability was investigated in terms of internal consistency (homogeneity), split-half reliability and item-total correlations.

All values in the study were found to be higher than 0.78. The findings indicate that the scales for the child and parent reports and their subscales have high reliability. item scale scores and item total scores are between 0.30-0.83. In the original form of the scale, total variances, total item scores and item subscale scores were between 0.15-0.58. According to these results, the total scores of all items of the scale and the total scores of their subscales show sufficient correlation, they adequately measure the desired quality, and item reliability of the scale and subscales are high ($p < .001$). The results of this study show that the Turkish version of PedsQL-PPCI is a scale of validity and reliability.

Construct validity and concurrent validity results strongly validate the PedsQL-PPCI child and parent form. This study can be used in the management of pain through obtaining an assessment of pediatric strategies related to coping with pain from both children and their parents. There is however a need for more studies to make an extensive evaluation of strategies related to coping with pain.

Table 1. Factor loadings, eigenvalues and explained variance for the PedsQL-PPCI child and parent reports (%) (n = 300)

Parent reports					Child reports				
Sub-scales	**Items**	**Factor loadings**	**Eigen value**	**Explained variance**	**Sub-scales**	**Items**	**Factor loadings**	**Eigen value**	**Explained variance**
F1	I.6	.853	9.727	15.992	**F1**	I.14	.653	9.226	13.98
	I.8	.791				I.15	.626		
	I.9	.713				I.16	.620		
	I.10	.670				I.17	.600		
	I.14	.422				I.18	.537		
	I.16	.568				I.19	.448		
	I.17	.474			**F2**	I.6	.839	7.232	11.90
	I.18	.523				I.7	.625		
	I.19	.424				I.8	.671		
						I.9	.842		
						I.10	.796		
F2	I.12	.544	4.05	12.153	**F3**	I.26	.682	3.586	10.808
	I.22	.691				I.23	.681		
	I.23	.666				I.24	.679		
	I.24	.585				I.22	.647		
	I.25	.718				I.25	.545		
	I.40	.540				I.40	.540		
						I.12	.485		
F3	I.5	.440	3.449	11.059	**F4**	I.5	.555	3.387	10.206
	I.20	.784				I.20	.619		
	I.36	.686				I.36	.781		
	I.37	.456				I.37	.761		
	I.41	.600				I.41	.550		

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F4	I.1	.734			**F5**	I.21	.497	2.823	9.82
	I.2	.690				I.27	.429		
	I.11	.445				I.28	.674		
	I.15	.679				I.31	.487		
	I.26	.689				I.32	.757		
	I.27	.685				I.33	.535		
	I.30	.668				I.34	.530		
	I.33	.716				I.35	.528		
	I.34	.490							
	I.35	.689							
F5	I.3	.797	2.681	9.35	**F6**	I.1	.749	2.786	8.65
	I.4	.678				I.2	.495		
	I.7	.638				I.3	.683		
	I.13	.553				I.4	.678		
	I.28	.664				I.13	.517		
	I.29	.528							
	I.37	.678							
F6	I.21	.628	3.634	8.438	**F7**	I.11	.820	2.102	6.605
	I.31	.569				I.29	.540		
	I.32	.548				I.30	.710		
	I.38	.504				I.38	.673		
						I.39	.579		
Total Explained variance (%)				**66.86**	**Total Explained variance (%)**				**71.969**
Total Scale Cronbach's Alpha				**.882**	**Total Scale Cronbach's Alpha**				**.887**

Table 2. Tukey's test of additivity, Split-half Coefficient test for the PedsQL-Pediatric Pain Coping Inventory (PedsQL-PPCI) child and parent reports

	Child reports	Parent reports
Tukey's test of nonadditivity	0.092	0.091
Spearman-Brown	0.828	0.825
Guttman Split-half coefficient	0.828	0.823

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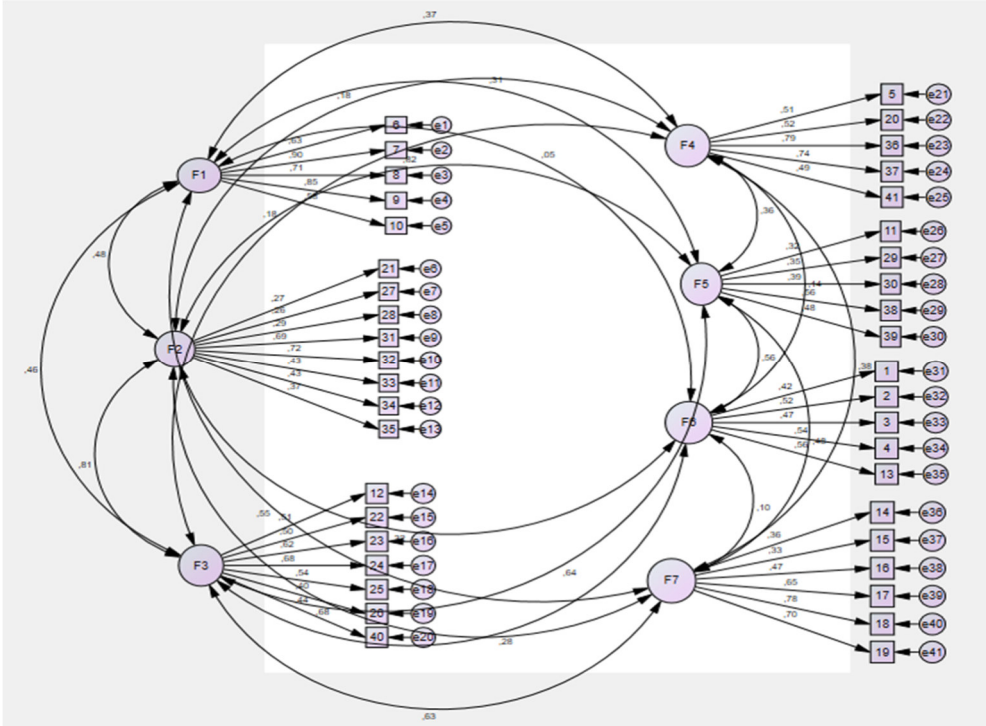
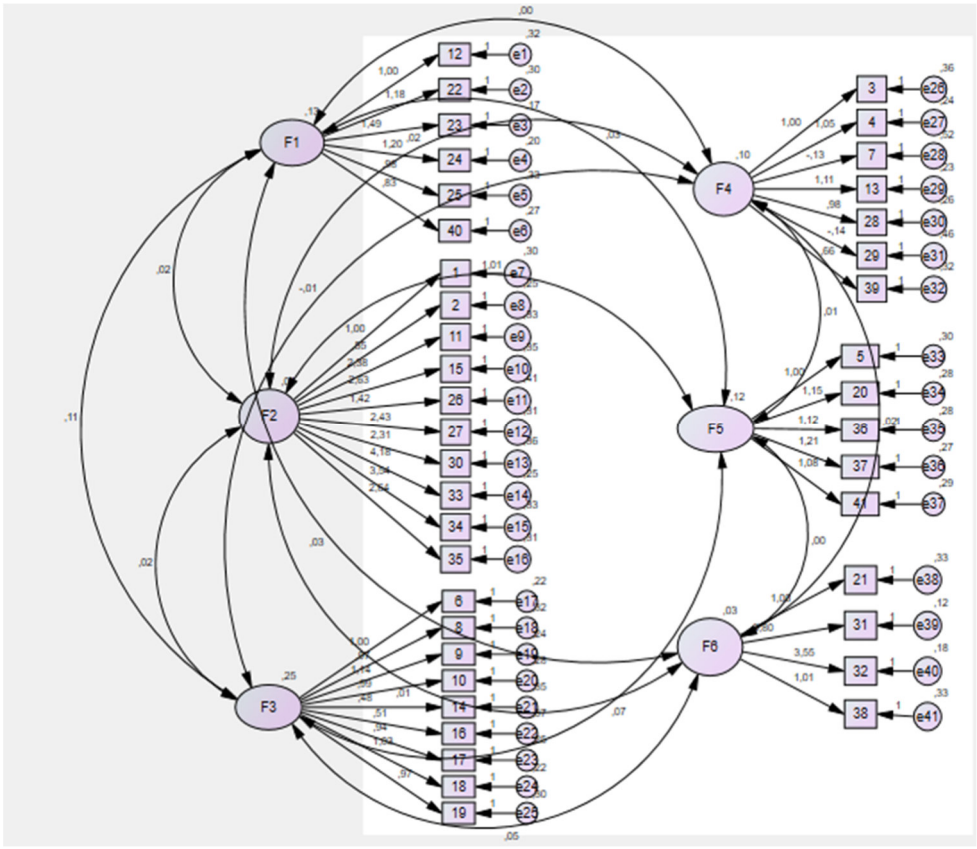
FIGURE LEGENDS



$\chi 2$ /df = 2.44, p < .001

Fig. 1. Confirmatory factor analysis of PedsQL-PPCI child reports



$\chi 2$ /df = 3.00, p < .001 RMSEA = 0.083

Fig. 2. Confirmatory factor analysis of PedsQL-PPCI parent reports

References

(1). Koç Özkan T, Balcı S. The Effect of Acupressure on Acute Pain During Venipuncture in Children: Implications for Evidence-Based Practice. Worldviews Evid Based Nurs 2020; 17(3): 221-8.

(2). Kozlowski LJ, Kost-Byerly S, Colantuoni E, Thompson CB, Vasquenza, KJ, Rothman SK, Monitto CL. Pain prevalence, intensity, assessment and management in a hospitalized pediatric population. Pain Manag Nurs 2014; 15(1): 22-35.

(3). Jee RA, Shepherd JR, Boyles CE, Marsh MJ, Thomas PW, Ross OC. Evaluation and comparison of parental needs, stressors, and coping strategies in a pediatric intensive care unit. Pediatr Crit Care Med 2012; 13(3): e166-75.

(4). Karakaya A, Gözen D. The effect of distraction on pain level felt by school-age children during venipuncture procedure—Randomized controlled trial. Pain Manag Nurs 2016; 17(1): 47-53.

(5). Thastum M, Zachariae R, Herlin TS. Pain experience and pain coping strategies in children with juvenile idiopathic arthritis J Rheumatol 2001; 28(5): 1091-8.

(6). Craig KD. A child in pain: A psychologist's perspective on changing priorities in scientific understanding and clinical care. Paediatr Neonatal Pain 2020; 2(2): 40-9.

(7). Crellin DJ, Babl FE, Santamaria N, Harrison D. A systematic review of the psychometric properties of the Modified Behavioral Pain Scale (MBPS). J Pediatr Nurs 2018; 40: 14-26.

(8). Hylén M, Akerman E, Alm-Roijer C, Idvall E. Behavioral Pain Scale–translation, reliability, and validity in a Swedish context. Acta Anaesthesiol Scand 2016; *60*(6): 821-8.

(9). García-Galicia A, del Carmen Lara-Muñoz M, Arechiga-Santamaría A, Montiel-Jarquín ÁJ, López-Colombo A. Validity and consistency of a new scale (Faces Pain Scale) and of the Spanish version of the CHEOPS scale to evaluate postoperative pain in children. Cirugia y cirujanos 2012; *80*(6): 510-5.

(10). Voepel-Lewis T, Shayevitz JR, Malviya S. The FLACC: a behavioral scale for scoring postoperative pain in young children. Pediatr Nurs 1997; 23(3): 293-7.

(11). Castarlenas E, Jensen MP, von Baeyer CL, Miró J. Psychometric properties of the numerical rating scale to assess self-reported pain intensity in children and adolescents. Clin J Pain 2017; 33(4): 376-83.

(12). DiLorenzo MG, Riddell RP, Flora DB, Craig KD. Infant clinical pain assessment: core behavioral cues. J Pain 2018; 19(9): 1024-32.

(13). Tang WX, Zhang LF, Ai YQ, Li ZS. Efficacy of internet-delivered cognitive-behavioral therapy for the management of chronic pain in children and adolescents: a systematic review and meta-analysis. Medicine 2018; *97*(36).

(14). Varni JW, Waldron SA, Gragg RA, Rapoff MA, Bernstein BH, Lindsley CB, Newcomb MD. Development of the Waldron/Varni pediatric pain coping inventory. Pain 1996; 67(1): 141-50.

(15). Hayes AF, Coutts JJ. Use omega rather than Cronbach's alpha for estimating reliability. But…. Commun Methods Meas 2020; 14(1): 1-24.

(16). Polit DF, Beck CT. The content validity index: are you sure you know what's being reported? Critique and recommendations. Res Nurs Health 2006; 29(5): 489-97.

(17). Taber KS. The use of Cronbach's alpha when developing and reporting research instruments in science education. Res Sci Educ 2018; 48(6): 1273-96.

(18). Erdogan Z, Kurcer MK, Kurtuncu M, Catalcam S. Validity and reliability of the Turkish version of the weight Self-stigma questionnaire. J Pak Med Assoc 2018; *68*(12): 1798-803.

(19). Souza ACD, Alexandre NMC, Guirardello EDB. Psychometric properties in instruments evaluation of reliability and validity. Epidemiol Serv Saude 2017; 26: 649-59.

(20). Lin CY, Imani V, Cheung P, Pakpour AH. Psychometric testing on two weight stigma instruments in Iran: Weight self-stigma questionnaire and weight bias internalized scale. Front Psychol 2019; 1-13.

(21). Watkins MW. The reliability of multidimensional neuropsychological measures: From alpha to omega. Clin Neuropsychol 2017; 31(6-7): 1113-26.

(22). Keszei AP, Novak M, Streiner DL. Introduction to health measurement scales. J Psychosom Res 2010; 68(4): 319-23.

(23). Onojakpor O, de Kock HL. Development and pilot testing of a questionnaire to assess sensory quality control (SQC) knowledge, attitudes and practices (KAP) of food company employees. Food Qual Prefer 2020; 86: 103996.

(24). Mortazavi F. Validity and reliability of the Farsi version of Wijma delivery expectancy questionnaire: an exploratory and confirmatory factor analysis. Electron physician 2017; 9(6): 4606-15.

(25). Swami V, Todd J, Barron D. Translation and validation of body image instruments: An addendum to Swami and Barron (2019) in the form of frequently asked questions. Body image 2021; 37: 214-24.