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RESEARCH ARTICLE

CROSS-CULTURAL ADAPTATION, VALIDITY, AND RELIABILITY OF THE TURKISH VERSION OF HEALTH PROMOTING ACTIVITIES SCALE

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ABSTRACT

Purpose: The Health Promoting Activities Scale (HPAS) is a short scale designed to question activities that may be beneficial for the mental and physical health of the mother and to evaluate mothers in this sense. The aim of the study was to cross-culturally adapt the Turkish version of the Health Promoting Activities Scale (HPAS-T) and to assess its reliability and validity.
Material and Methods: Eighty mothers of disabled children who received physiotherapy in a rehabilitation center were recruited in the study. HPAS-T was administered to mothers twice, one-week apart. Internal consistency of HPAS-T was assessed with Cronbach's alpha coefficient. Additionally, test–retest reliability was analyzed using intra-class correlation coefficient. Exploratory factor analysis was conducted to evaluate the construct validity. Besides, known-group validity in terms of body mass index was conducted to reveal the discriminant capacity of the HPAS-T.
Results: The mean age of the mothers and their children was 37.4±6.3 years and 8.1±4.1 years, respectively. The internal consistency and reproducibility of the HPAS-T total score was excellent (α>0.80, ICC>0.80). SEM_{95} and MDC_{95} of the HPAS-T values were 0.58 and 1.61, respectively. HPAS-T, all items were loaded into a single component (0.470-0.833). According to the results of known-group validity model, the HPAS-T score of the mothers in the group whose children's body mass index was ≥18 was significantly lower ($p<0.05$).
Conclusion: HPAS-T is a valid and reliable questionnaire in mothers of disabled children population. HPAS-T should be used to evaluate the level of participation in leisure occupations of mothers with developmentally disabled children.

Keywords: Caregiver, health promotion, reliability, Turkish version, validity

INTRODUCTION

According to the World Health Organization, 10% of the population is disabled and according to this rate, there are more than 8.4 million disabled people in Turkey, and an important part of these is children. The fact that the problems seen in children with disabilities are multifaceted make not only the disabled child but also family members dependent and cause them to encounter various social and social unjust treatments. Culturally and traditionally care for the child in Turkey is assuming most mothers. Therefore, mothers learn more about the level of participation of their children in daily life activities and the amount of support required to increase their participation. (1)

Mothers with disabled children should be conscious, talented and organized in order to meet the health and development needs of their children. It is known that mothers cannot spare time for themselves, especially for their children. This also creates psychological problems for the mother. In such cases, the mental health of mothers may be endangered, so they need more support. The Health Promoting Activities Scale (HPAS) is a short scale designed to question activities that may be beneficial for the mental and physical health of the mother and to evaluate mothers in this sense. (2)

The value of home care and reintegration of a disabled child into the home is not only financially beneficial, but also has a positive impact on the health and well-being of the child and family. (3) Parents express their own reactions to home care as happy, confident, satisfied and generally satisfied with the experience of having the child home. (4) However, these benefits will not have implications for the child's primary care provider, especially mothers. An increase in depressive symptoms and adverse health effects have been reported in mothers and parents caring for disabled children at home. (5) There are no version studies of HPAS in other languages and also its Turkish adaptation is not revealed before. The study was aimed to ensure the cultural adaptation, reliability and the validity of the HPAS-T.

MATERIAL AND METHODS

Required permissions have been obtained from developer of the HPAS (Prof. Helen Bourke-Taylor) prior to initiation of translation work via email. Eighty mothers of children who received physiotherapy in a rehabilitation center were included in the study. Written and verbal consent was obtained from all subjects. The consents were made in compliance with all the rules during the pandemic process.

Inclusion and exclusion criteria were as follows: (1) >18 years old, (2) primary caregiver of child with disability, (3) primary caregiver of child who live in the same house, (4) Mothers who cannot speak and understand Turkish, (5) Caring for more than one disabled child were excluded from the study. This study was approved by Pamukkale University's Ethics Committee (Date: 03.11.2020, Number: 60116787-020/66565).

Outcome Measures

Health Promoting Activities Scale (HPAS)

Health Promoting Activities Scale is a short psychometric measurement tool that can be used in clinical applications. The disabled child is a scale that questions the leisure activities chosen by the mother and also evaluates the physical and mental health. The scale was developed by Bourke-Taylor et al in 2012. Each item is evaluated using a 7-point Likert scale. (1 = never, 2 = 1-3 times a year, 3 = once a month, 4 = 2-3 times a month, 5 = once a week, 6 = 2-3 times a week, and 7 = one or more days at a time). The score is obtained by adding 8 items. Low scores indicate less engagement, higher scores indicate higher engagement. (2)

Translation and Cross-Cultural Adaptation Study

The cultural adaptation process of the questionnaire was formed in four phases and was implemented using the international guidelines. (6, 7). The-pre-final study was conducted to ensure that the latest version still provides linguistic equivalence. For the pre-final version was conducted with the mother of thirty neuro-developmentally disabled children. The acceptability and comprehensibility of the translation was examined taking into account the notes obtained as a result of the interviews made by the translators and physiotherapists and the answers given by the mothers who completed the pre-final version. All kinds of questions related to idioms, synonyms, and casual conversation were recorded. According to these inquires, several changes were performed during pre-final version development. First, the mothers had confusion about the meaning of "fun" and "silent-quiet". In Turkish, the distinction of some words is possible only when they are used in sentences. For example, the word "silent" and the word "quiet" are expressed with the word "sessiz" in Turkish. However, this word can mean "non-sound, muted" or it can mean "calm". The same is true for the words "promoting" and "improving". The Turkish equivalent of both words is "geliştirmek". The word "geliştirmek" corresponds to both "promoting health" and "improving a skill". For this reason, we used this word when translating the scale into Turkish, and while back-translation, translators used the word "improving" as an English word that could correspond to the word "geliştirmek". As a result, the required meaning will come out when the sentence is read in the Turkish version of the scale.

Unfortunately, there is no Turkish word that fully describes the word “recreation”, we just have the word “rekreasyon”. However, the population may

have difficulty understanding this word. The word “recreation” corresponds to meanings such as “rest, relaxation, entertainment and fun” in Turkish. Therefore, the word "fun" may be found in the back translation. No conflicts were encountered in the pre-final version.

Following the pilot testing, HPAS-T was administrated to 80 mothers. Thus, T-HPAS has been successfully translated according to Turkish (Appendix 1). Demographic and clinical data were taken from all mothers through an interview.

Table 1. The characteristics of the mothers

n: 80	Total
Mother’s age (years, mean±SD)	37.4±6.3
Mother’s BMI (kg/m^2, mean±SD)	26.4±4.6
Mother's number of children (count, mean±SD)	2.2±0.8
Mother’s education level (n, %)	
Illiterate	1 (1.2)
Primary school	52 (65)
High school	16 (20)
Undergraduate or higher	11 (13.8)
Mother’s work (n, %)	
Housewife	70 (87.5)
Employee	9 (11.3)
Retired	1 (1.2)
Marital status (n, %)	
Married	70 (87.5)
Single, separated or divorced	10 (12.5)
Assistant to take care of the child (n, %)	
Yes	36 (45.0)
No	44 (55.0)

SD: standard deviation, n: number of patients, BMI: body mass index

Statistical Analysis

“Statistical Package for the Social Sciences 22.0” was used for statistical analyses. Internal consistency of HPAS-T was assessed with Cronbach's alpha coefficient. Cronbach's Alpha value was considered excellent for above 0.80. (9) Additionally, test–retest reliability was analyzed using intra-class correlation coefficient (ICC; one way random). (10) Accordingly, HPAS-T was administered to the same participants (80 mothers) 7 days later following the initial evaluation. Besides. minimal detectable change (MDC) and the standard error of measurement (SEM) was calculated. (11). Exploratory factor analysis was conducted to evaluate the construct validity of HAPS-T. The adequacy of the sample was tested with Kaiser Meyer Olkin Test (KMO) and Sphericity with Bartlett test before construct validity was performed. It has been reported that the lower limit of KMO should be 0.50 so that the data cluster cannot be factorized for KMO>0.50 (un-factorability). (12) Therefore, we determined that factor analysis could be performed for HPAS-T. Besides, known-group validity was conducted to reveal the discriminant capacity of the HPAS-T. The mothers and also children were grouped according to the body mass index classifications. (13, 14) Mann Whitney U or Kruskal Wallis test were used for the demonstrate the statistical difference between the groups.”

RESULTS

A total of 80 mothers (37.4±6.3 years) and their 80 children (8.1±4.1 years, 32 female) were recruited in the study. The BMI of the mothers and children were 26.4±4.6 kg/m^2 and 18.9±5.6 kg/m^2, respectively. A vast majority of the mothers were housewife and married (87.5%). 45% of the mothers were receiving assistance support for the care of their children. Besides, 41.3% of the children were using assistive device. The socio-demographic and physical characteristics of the mothers and children are presented in the Table 1 and Table 2, respectively. The absolute values of the T-PAS test and re-test are given in Table 3.

Reliability

Table 2. Characteristics of the children

n: 80	Total
Children's age (years, mean±SD)	8.1±4.1
Children's BMI (kg/m^2, mean±SD)	18.9±5.6
Gender (n, %)	
Female	32 (40)
Male	48 (60)
Assistive device (n, %)	
Yes	33 (41.3)
No	47 (58.7)
School category of the child (n, %)	
State school	31 (38.8)
Special education	48 (60)
Private school	1 (1.2)

SD: standard deviation, n: number of patients, BMI: body mass index

Absolute values of the test and retest of the HPAS-T is presented in Table-3. The internal consistency of the HPAS-T total score was excellent (α>0.80). In addition, all items' alpha values of the HPAS-T were also calculated to reveal the reliability, comprehensively. The Alpha score of each item shows whichever the actual alpha score will be when the related question is deleted from the questionnaire. The item based alpha values were ranged between 0.778 to 0.826 (Table 3). Besides the alpha, ICC was also calculated for the reliability. Test and retest evaluations was formulated for the total score and the items of the HPAS-T. The reproducibility of the HPAS-T was excellent (ICC>0.80). In addition, all items of the H-PAS were calculated to be excellent in terms of test-retest reliability (ranged between 0.990 to 0.999) (Table 3). To demonstrate reliability furthermore, SEM_{95} and MDC_{95} of the HPAS-T values were 0.58 and 1.61, respectively. All items' SEM_{95} and MDC_{95} were given in Table 3.

Validity

Mothers' response to the items of the HPAS-T and the factor loadings is shown in Table 4. Besides, scree plot of the factor analysis is presented in the Figure 1. Construct validity was revealed by the principal component analysis extraction method with

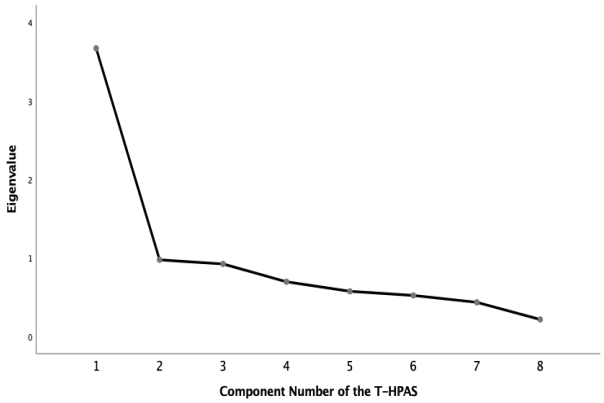

Figure 1. Scree plot of the factor analysis

varimax rotation. The adequacy of the sample was evaluated prior to the factor analysis calculation. The significance level of Bartlett's test of sphericity was less than 0.001. The Kaiser-Meyer-Olkin (KMO) test of the model was 0.814. The extracted factor loading of the items were acceptable to high (except item 2), ranged from 0.470 to 0.833 (Table 4). Since there is no subscore of the HPAS-T, all items were loaded into a single component, as expected. The cumulative variance of the single factored questionnaire in the initial eigenvalue was 45.88% (Figure 1).

DISCUSSION

The present study was purposed to demonstrate the cross-cultural adaptation of the HPAS-T. The relevant psychometric analyses were conducted in terms of reliability and validity to provide the compatibility of the HPAS in Turkish-speaking mothers with disabled children. The results of the study revealed that HPAS-T was adapted in accordance with Turkish culture and had sufficient psychometric validity and reliability. HPAS-T is a practical, short-structured, and standardized patient report outcome measure that provides physiotherapists, occupational therapists, and other rehabilitation specialists to evaluate the level of participation in leisure occupations of mothers with developmentally disabled children. (2, 15, 16) It provides an essential contribution in terms of revealing the level of participation of mothers in health-enhancing leisure activities and raising awareness in order to increase their participation. Besides, through the monitoring of the questionnaire's outcomes and its change over time, it

Table 3. Absolute values, internal consistency and, the test-retest reliability of the T-HPAS

n: 80	Test (Mean±SD)	Retest (Mean±SD)	ICC (95% CI)	α	SEM_{95}	MDC_{95}
Item 1	4.64±1.89	4.60±1.88	0.988 (0.981-0.992)	0.816	0.08	0.23
Item 2	3.84±2.00	3.81±1.95	0.994 (0.990-0.996)	0.826	0.15	0.43
Item 3	3.80±2.14	3.83±2.12	0.995 (0.991-0.996)	0.791	0.15	0.42
Item 4	3.16±2.07	3.14±2.06	0.997 (0.995-0.998)	0.822	0.11	0.31
Item 5	3.87±2.14	3.86±2.15	0.999 (0.998-0.999)	0.783	0.07	0.19
Item 6	3.23±1.90	3.25±1.91	0.993 (0.989-0.996)	0.778	0.16	0.44
Item 7	3.69±1.62	3.69±1.61	0.995 (0.993-0.997)	0.809	0.11	0.32
Item 8	3.55±2.05	3.69±1.61	0.990 (0.984-0.994)	0.785	0.21	0.57
T-HPAS (total)	29.77±10.65	29.66±10.60	0.997 (0.996-0.998)	0.823	0.58	1.61

n: number of patients, SD: standard deviation, α: Cronbach's alpha ICC: intra-class correlation coefficient, CI: confidence interval, SEM_{95}: standard error of measurement, MDC_{95}: minimal detectable change

would be possible to provide specific and personalized recommendations for a healthy lifestyle, which is a specific part of the family-centered approach for the caregivers of disabled children. (17) Considering the lack of studies investigating the relationship between maternal health and recreational/leisure time activities simply reveals the importance of HPAS. In this context, the lack of other patient reporting outcome measures evaluating mothers' participation in health-promoting leisure activities indicates the requirement of HPAS. (2, 15) To our knowledge, no other language versions have demonstrated the cross-cultural adaptation of HPAS. The Turkish version study of HPAS is a unique tool in this respect. Therefore, describing specific clinical practice activities that improve the health and mothers' quality of life will also provide a comprehensive leisure occupation-based factor review.

Heretofore, two further validation studies were conducted in addition to the development study of the HPAS. (2, 15, 16) The initial development study of the HPAS was conducted with the mothers of disabled children. (2) In a secondary, further validation study, school-aged children's mothers were recruited in the study. (15) Besides, a tertiary intra-rater reliability study was carried out with a cohort of school-aged children's mothers. (16) In our study, we included a total of 80 school-aged (8.1±4.1 years) and also disabled children's mothers aged 37.4±6.3 years. Considering the poor health status and morbidity rate of the mothers who have given birth at an advanced age (>40), our sample was calculated to be adequate to provide homogenous data on life quality in terms of health promotion. (18)

In the cross-cultural adaptation phase of the study, it was deemed appropriate to make some modifications, which are explained in detail in the method section. Accordingly, HPAS-T was found suitable for psychometric analysis in terms of comprehensibility. Internal consistency was analyzed with the Cronbach's alpha coefficient. Internal consistency reliability measures whether each item in a standardized questionnaire is related to each other and consistently aimed to assess the same matter. (19) Due to the high coefficient of consistency in HPAS-T (>0.70), the survey items were found to measure health-promoting activities reliably and consistently. In addition, by measuring each item's consistency level, it is possible to detect the possible lowly reliable and unnecessary test items in HPAS-T. The HPAS-T total score's alpha coefficient was 0.823, and the independent items ranged between 0.778 to 0.826. The HPAS-T was found to provide a consistent and standardized assessment despite questioning health-promoting items that question broad-spectrum

Table 4. Response to items and factor loadings of the T-HPAS

n: 80	Never (n, %)	1-3 times/year (n, %)	Once a month (n, %)	2-3 times/month (n, %)	Once a week (n, %)	2-3 times/week (n, %)	Once or more everyday (n, %)	Component 1
Item 1	9 (11.2)	4 (5.0)	7 (8.8)	12 (15.0)	18 (22.5)	15 (18.8)	15 (18.8)	0.575
Item 2	13 (16.2)	8 (10.0)	18 (22.5)	13 (16.3)	10 (12.5)	4 (5.0)	14 (17.5)	0.470
Item 3	20 (25.0)	6 (7.5)	9 (11.3)	12 (15.0)	14 (17.5)	6 (7.5)	13 (16.2)	0.744
Item 4	27 (33.6)	10 (12.5)	11 (13.8)	7 (8.8)	13 (16.3)	4 (5.0)	8 (10.0)	0.519
Item 5	18 (22.5)	9 (11.2)	6 (7.5)	12 (15.0)	16 (20.0)	5 (6.3)	14 (17.5)	0.787
Item 6	22 (27.5)	12 (15.0)	10 (12.5)	14 (17.5)	11 (13.8)	6 (7.5)	5 (6.2)	0.833
Item 7	9 (11.4)	11 (13.8)	13 (16.4)	25 (31.3)	13 (16.3)	3 (3.8)	6 (7.5)	0.610
Item 8	19 (23.7)	11 (18.7)	11 (13.8)	10 (12.5)	14 (17.5)	5 (6.3)	10 (12.5)	0.781

n: number of patients, extraction method: principal component analysis; rotation method: varimax with Kaiser normalization

leisure occupations (e.g., nutrition, physical activity, religious worship, and social activities). The sixth item with the lowest alpha value (0.778) was considered to express a more general concept ("time out for yourself to spend as you wish") compared to the other items. Therefore, it was considered to slightly lower due to the personal comprehension of the participants. However, despite this, the coefficient was almost perfect and highly consistent (>0.70). The initial development, secondary and tertiary psychometric analyze studies calculated Cronbach's alpha of the HPAS's total score as 0.78, 0.78 and 0.73, respectively. Although these studies' coefficients were found to be slightly lower than our study, all of them had an acceptably high consistency. (2, 15, 16) Furthermore, our study is unique in that it also presents alpha values of HPAS substances for the first time.

The reproducibility of the HPAS-T's total score and the items were excellent (ICC>0.80). Test-retest reliability is an indispensable psychometric parameter for measuring the reliability of the patient-reported outcome measures. Test-retest reliability is carried out in intervals of 7 days according to internationally accepted recommendations. It shows the reliability of the HPAS-T in terms of whether it properly reflects the participant's actual status in repeated measurements conducted at different times. (19) Only the tertiary psychometric analysis study was presented the intra-rater reliability (i.e., test-retest). The ICC was found to be 0.90 for the total score of the HPAS (16). Likewise, ICC was found to be highly reliable as in our study (>0.80). On the other hand, the reproducibility of the items of the HPAS was firstly given in our study. Generally, some items may have a low ICC score, which may indicate low reliability in terms of understandability. However, all HPAS-T items were also found to be perfectly reliable.

The minimal detectable change is described as an actual difference amount of the participant by the time that is not due to bias or chance. (20) In our study, the MDC95 score was 1.61 for the total score. However, the tertiary validation study of the HPAS presented the MDC as 5.0. (16) Nevertheless, it should not be overlooked that there was not enough sample size to calculate the MDC in a healthy-way with a 56-person cohort study. (21) In studies with small sample size, the standard deviation may be large due to the inhomogeneous sample, which affects SEM and thus MDC. (22) Therefore, the MDC value may have been different between the two studies. In addition, the psychometric analysis was performed in mothers of school-age children in the tertiary validation study, and in mothers of children with disabilities in our study. (16) As a matter of fact, this MDC difference could be considered natural in terms of methodologic

Table 5. Known-groups validity of the T-HPAS for BMI

		n (%)	Median HPAS score	p	x
Mother's BMI	18.5−24.9	33 (41.3)	35	0.071[a]	5.286
	25.0-29.9	34 (42.5)	26.5		
	≥30	34 (16.2)	29		
Children's BMI	<18	39 (48.8)	27	**0.038**[b]	-2.071
	≥18	41 (51.2)	34		

n: Number of patients, a: Mann Whitney U test, b: Kruskal Wallis test, x: H or Z depending on a or b

contrarieties. As a result, it should be noted that these data are valuable for rehabilitation specialists to use MDC changes in clinical practice in maternal health monitoring.

Since there were no equivalent Turkish PROMs for construct validity, factor analysis and known-groups validity methods were used in our study. Explanatory factor analysis is used to explain the factor structure of the questionnaire. (23) The principal component analysis is presented to show the structure of the HPAS-T by defining the primary relationships between the variables that measure. (24) Since HPAS is a questionnaire that evaluates only health-promoting activities with a total score, it was expected to have a single factor structure. According to the analysis results, all items were loaded into a single component (0.470-0.833). HPAS had a single factor and high structural validity in both the initial development study (0.56-0.68) and the secondary validation study (0.54-0.77). (2, 15) Both studies were similar to our study in terms of factor loadings. In our study, the only item with a factor loading below 0.50 was "2". The possibility that the recreational activities performed alone by the individual may be related to an asocial personality style in some cases or that the expression of recreational activity may be considered as an activity that cannot be performed alone may bring this factor with the possibility of having a low coefficient. (25)

A known-group validity model was built to consider the discrimination capacity of the questionnaire. (26) One of the most critical parameters that negatively affect mothers' leisure activities is body mass index (both children's and mother's) since caregiving include heavy lifting (e.g., child transfer, vehicle transport). (2) Therefore, according to the recommended cut-off values, we divided mothers and children into triple and double groups, respectively. (27, 28) The HPAS-T score of the mothers in the group whose children's body mass index was ≥18 was significantly lower ($p<0.05$). On the other hand, there was no significant difference between the groups formed according to the mothers' body mass index ($p>0.05$). The secondary validation study was demonstrated a significant difference between the groups classifies in terms of mothers' body mass index ($p> 0.001$). (15) HPAS scores of obese and overweight mothers were found to be low. Considering that mothers' mean body mass index in our study was 26.4±4.6 kg/m^2, the low number of overweight (or obese) participants may be the reason for the lack of statistically significant difference.

The limitations of our study should be emphasized to designing further studies comprehensively. Firstly, no other PROMs were used for the construct validity due to the lack of equivalent questionnaires available. However, validity could be investigated with similar subscores by comparison with the quality-of-life questionnaires (e.g., Short Form-36). Secondly, a more homogeneous set of cases (e.g., mothers and their children with cerebral palsy) and a psychometric analysis with a cohort representing Turkish-sample can provide more accurate results. Lastly, known-group validity was analyzed with a small sized separate group of mothers and children. Therefore, the intergroup discrimination capacity of our analysis may be low.

CONCLUSION

HPAS-T found to be valid and reliable in mothers with disabled children. HPAS-T is a practical, short, and user-friendly questionnaire that can be used by rehabilitation specialists, especially occupational therapists and physiotherapists, in maternal health follow-up. Besides, actual change monitoring of the

mothers' health-promoting activities will also be possible through MDC scores.

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Ethical approval: The permission for the translation for the Turkish version of Health Promoting Activities Scale was acquired from the developer of the original questionnaire. The study was carried out in accordance with the ethical principles and the Helsinki Declaration. Informed consents of the patients were obtained. The study protocol was approved by the ethics committee of Pamukkale University (Date: 03.11.2020, No:60116787-020/66565).

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