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Original Article

Validity and Reliability of the Persian Adolescent Leisure Interest Profile in Adolescents with Cerebral Palsy

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Abstract

Background: This study was conducted to evaluate the psychometric properties of a Persian version of the Adolescent Leisure Interest Profile (ALIP) in Persian-speaking adolescents with Cerebral Palsy (CP).

Methods: Thirty adolescents with CP participated. The test-retest reliability, construct validity of the ALIP with the Children's Assessment of Participation and Enjoyment (CAPE), and discriminative validity were examined.

Results: There were no floor and ceiling effects. Test-retest reliability of the Persian version of the ALIP for the total scores ranged from 0.69-0.94. Cronbach alpha for internal consistency of the Persian ALIP was obtained 0.98. Evidence for construct validity was found with significant correlations between the ALIP and the CAPE domains (r=-0.45-0.69). The standard error of measurement and the smallest detectable change values were 0.08-8.22 and 0.22-22.87, respectively.

Conclusion: The Persian version of the Adolescent Leisure Interest Profile is a useful tool for measuring leisure activities in Persian-speaking adolescents with CP.

Keywords: Adolescent, Child, Reproducibility of results, Psychometrics, Pleasure, Persian people, Leisure activities, Cerebral palsy

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Introduction

Cerebral Palsy (CP) is the most common childhood motor disorder caused by damage to the developing brain (1). The CP characterized by a number of problems such as limitation in activity/participation in social and daily living skills (2). The overall prevalence of CP worldwide is 2.11 *per* 1000 live births (3).

Leisure is an important domain in Occupational Therapy (OT). Concept of Leisure is complex. According to the Occupational Therapy Practice Framework (OTPF-4), leisure is defined as an occupation. It is a "nonobligatory activity that is intrinsically motivated and engaged in during discretionary time, that is, time not committed to obligatory occupations such as work, self-care, or sleep" (4). Leisure activities provide enjoyment and relaxation; therefore they are necessary for human health (5). Evaluating leisure is very important due to the role it plays in human life, and considering that in occupational balance is also significant and contemplative (4). On the other hand, promoting leisure participation as part of the International Classification of Functioning, Disability and Health (ICF) Core Sets of CP is also very necessary (2).

Adolescents spend considerable time engaged in leisure activities and participation in these activities associated with increased social, cognitive, and physical skills as well as well-being (6-8). Leisure researchers believe that people with disabilities use leisure as a way of coping with stress. They provide evidence that leisure helps people with disabilities to achieve coping strategies, and improve their disability acceptance (9-12).

There are some tools for the assessment of leisure activities such as the Children's Assessment of Participation and Enjoyment (CAPE) developed for 5-21-year-old children. This instrument evaluates 55 leisure activities but without school activities, and it is also much more child-friendly in terms of using pictures and cards (13). Children Participation Assessment Scale (CPAS) as a parent report scale examines the participation of children aged 6-12 years in the form of 71 activities outside of school (14). The Adolescent Leisure Interest Profile (ALIP) is a self-report measure and age-appropriate profile of leisure interest and participation which was designed based on the Model of Human Occupation (15). ALIP was used in adolescents with and without disabilities with 83 items in 8 categories (Sports, Outdoor, Exercise, Relaxation, Intellectual, Creative, Socializing, and Club/Community activities) (15). ALIP covers more activities (with and without school activities) and it is easy to use.

ALIP is originally in English (15) and has been used in several studies (16-18) and translated into other non-English languages (19). At the moment, there is no Persian version of the questionnaire that evaluates leisure time activities in different domains (physical, mental, and social) in Persian language adolescents. The aim of this study was to provide a Persian version of the ALIP (ALIP-P), and to determine its validity and reliability.

Materials and Methods

Study design

This study used a cross-sectional design to translate and adapt the ALIP into the Persian language in adolescents with CP after obtaining permission from the developer. Before study initiation, a written informed consent was obtained from all the participants or their caregiver/s.

Translation and cross-cultural adaptation

The translation and cultural adaptation of the ALIP was performed following the forward-backward translation procedure (20). Two professional translators independently translated the ALIP into the Persian language. The research team (three Occupational Therapists and one Physiotherapist and both translators) discussed any misunderstanding and agreed on a synthesized Persian version of the ALIP. Then, two other bilingual translators independently back-translated the agreed version of the Persian ALIP into English. The backward translators were blinded to the study and had no prior knowledge of the scale. To ensure the accuracy of the backward version, it was sent to the developer and her approval was obtained (20) .

Face and content validity was performed with ALIP-P in 30 typically developing adolescents. Adolescents completed a questionnaire and then interviewed them about the meaning and concept of each item. After some changes, the ALIP-P was finalized for further

evaluations of validity and reliability.

Participants

Thirty adolescents with CP and thirty typically developing peers were recruited in this study to satisfy the minimal sample size based on the quality criteria required for reliability and validity (21). Inclusion criteria for adolescents with CP were: 1) aged between 10 and 18 years old for girls and 12 and 20 years old for boys; 2) ability to read and write; and 3) do not have a residence in a care center. Exclusion criteria were: 1) adolescents with current psychotic symptoms, severe depression, and severe mania; 2) an IQ of less than 70.

Procedure

The adolescents with CP were recruited from two schools in Tehran, Iran. An experienced occupational therapist recorded demographic data and determined the adolescents' level of gross motor skills using the Gross Motor Function Classification System (GMFCS) and the cognitive levels of adolescents using the SPARCLE form (22).

As noted, for all 83 items in ALIP, five questions are asked. Question 1: How interested are you in this activity? Very=3, Somewhat=2, Not at all=1. Question 2: How often do you do this activity? 3 to 7 times a week=5, Less than 3 times a week=4, 1 to 2 times a month=3, Less than 1 time a month=2, Never=1. Question 3: How well do you do this activity? Very well=3, Well= 2, Not very well=1. Question 4: How much do you enjoy this activity? Very much=3, Somewhat=2, Not at all=1. Question 5: Who do you do this activity with? By myself=1, With friends=1, With family= A mean score for each activity category and for the total score of each question are calculated (17).

To investigate the discriminative validity, typically developing adolescents also completed the ALIP-P. Finally, 30 adolescents with CP completed the ALIP-P again one week later to study its test-retest reliability. To determine construct validity, adolescents with a diagnosis of CP completed the ALIP-P and CAPE (23).

Statistical analysis

SPSS software, version 25 (IBM Corp., Armonk, New York, USA) was used for data analyses. The percentage frequency of the lowest or highest possible score of respondents was calculated for floor and ceiling effects with ≥15% indicating significance (21). Cronbach's α was calculated to assess the internal consistency. Cronbach's α coefficient greater than 0.7 was regarded as acceptable (24). The intraclass correlation coefficient ($ICC_{agreement}$) (two-way random effects model, absolute type) was applied to measure test-retest reliability. ICC values ≥0.70 indicate excellent reliability (24). The SEM was calculated using the equation SD √1-ICC (21,25). The equation 1.96× SEM ×√2 was utilized to calculate the SDC to reveal whether the change score of a patient is real at the 95% confidence interval (25,26). Discriminant validity was calculated by independent t-test comparing the adolescents with CP and typically developing peers. Pearson correlation was used to determine the construct validity by correlating the ALIP-P to the CAPE.

Results

Sample characteristics

A total of 60 adolescents, 30 with CP and 30 typically developing adolescents (30 girls and 30 boys) participated. Table 1 presents the demographic and clinical characteristics of the adolescents with CP.

Translation and adaptation of the ALIP proceeded without problems. The final version of the ALIP-P was well understood and accepted by adolescents in both field testing and the main stage of the study. They responded to all items of the ALIP, and therefore no missing data were observed. The adolescents interpreted the items of the ALIP as clear and relevant to their leisure activities. During translation and cross-cultural adaptation process, based on the feedback from adolescents, a revision was made for the prefinal version; baseball/softball, soccer, ice or field hockey and cheerleading activities in the sports activities category and BMX/mountain biking and ATV/dirt biking activity in the outdoor activities category were changed to Wrestling, Ping-Pong, Karate, Badminton, Bicycling, Motorcycling Activities, respectively. Also, "Modeling" to "Making maquette", "Discussion" to "Group discussion", and "Youth groups activities" to "Youth cultural groups" were changed. These changes were due to the

Table 1. Characteristics of children with cerebral palsy (n=30) and healthy adolescents (n=30)

	CP	Healthy adolescents
Age (years; mean ± SD*, range)	15.6±2.8, 10-19	14.03±2.65, 10-20
Sex		
Boys	15	15
Girls	15	15
School education (years; mean ± SD [range])	8.8±3.1 (3-12)	7.70±2.8 (4-13)
Type of CP		
Hemiplegia	7	
Diplegia	3	
Quadriplegia	12	
Ataxia	8	
GMFCS		
Level I	5	
Level II	9	
Level III	4	
Level IV	9	
Level V	3	

*SD: Standard Deviation; **GMFCS: Gross Motor Function Classification System.

difference between Iranian and English cultures.

Floor and ceiling effects

The ALIP scores were well distributed. Only two CP adolescents had a minimum score for "By myself?" and "With friends?" questions. None had achieved a maximum or minimum score. Thus, the floor and ceiling effects were not observed for the ALIP total scores.

Internal consistency

Internal consistency was calculated for the subscales and the total scores among adolescents with CP. The Cronbach's alpha for the subscales (Table 2) and the total scores (Table 3) were high ranging from 0.84 to 0.95 and 0.88 to 0.96, respectively.

Test-retest reliability

Test-retest reliability, ICC, of the total scores for all seven questions were good or excellent ranging from 0.69 (With friends?) to 0.95 (How much enjoy?) (Table 4). The Standard Error of Measurement (SEM) and the Smallest Detectable Change (SDC) were calculated for all seven total scores in the ALIP (Table 4). SDC ranging was from 0.22 (How interested?) to 22.78 (with friends?).

Discriminative validity

The comparison of subscale scores and total score for first question (*i.e.*, How interested?) in the ALIP revealed significant differences between sports activities (p=0.001) and outdoor activities (p=0.03). Adolescents with CP had higher scores of interests in these activities than typically developing peers. There were no significant differences in other activities and total score for the first question.

Independent t-test indicated significant differences between two groups for the second question (*i.e.*, How often?) except in the relaxation activities (p=0.06) and intellectual activities (p=0.2).

There was a significant difference between the groups in all of subscale scores and total score on the "How well" question, except for relaxation (p=0.18) and creative activities (p=0.08). Level of self-perception of typically developing adolescents was higher than

Table 2. Cronbach's α values of ALIP* subscales for adolescents with CP (n=30) and healthy adolescents (n=30)

	Sports activities	Outdoor activities	Exercise activities	Relaxation activities	Intellectual activities	Creative activities	Socializing activities	Club/ community activities
Adolescents with CP	0.90	0.86	0.91	0.84	0.90	0.89	0.95	0.91
Healthy adolescents	0.90	0.92	0.85	0.86	0.95	0.94	0.94	0.95

* Adolescent leisure interest profile.

Table 3. Cronbach's α values of ALIP* total scores for adolescents with CP (n=30) and healthy adolescents (n=30)

	How interested?	How often?	How well?	How much enjoy?	With others or alone?
Adolescents with CP	0.96	0.88	0.90	0.88	0.89
Healthy adolescents	0.94	0.92	0.92	0.92	0.96

* Adolescent leisure interest profile.

Table 4. Test-retest reliability for Persian ALIP in adolescents with cerebral palsy (n=30)

Questions	ICC	95% Confidence interval	SEM **	SDC *
How interested?	0.94	0.87-0.97	0.08	0.22
How often?	0.80	0.61-0.90	0.1	0.28
How well?	0.85	0.70-0.92	0.15	0.41
How much enjoy?	0.95	0.89-0.97	0.09	0.24
By myself?	0.79	0.60-0.90	5.7	15.8
With friends?	0.69	0.45-0.84	8.22	22.78
With family?	0.91	0.81-0.96	5.36	14.85

* Standard Error of Measurement. ** Smallest Detectable Change.

adolescents with CP.

A significant difference was found between the groups in the enjoyment total score and enjoyment subscale scores of sports (p>0.001), exercise (p>0.001), and club/community activities (p>0.001). Scores for outdoor activities (p=0.83), relaxation (p=0.53), intellectual (p=0.1), creative activities (p=0.46), and socializing activities (p=0.93) between two groups were not significant. Level of enjoyment of adolescents with CP was lower than typically developing peers.

There were significant differences between the groups in total scores on the "By myself?" (p>0.001) and "With friends?" (p>0.001) questions, but there were no significant differences in total score on the "With family?" (p=0.15) question (Table 5).

Construct validity

A significant correlation was obtained between some of the ALIP items and the domains of the CAPE. Regarding the "How interested?" question in the ALIP, significant correlations with the CAPE domains of diversity (r=0.37, p=0.04) and enjoyment (r=0.50, p=0.006) were found. The "How often?" question in the ALIP was correlated significantly with domains of diversity (r=0.69, p>0.001), intensity (r=0.55, p=0.002) and where (r=0.40, p=0.03) in the CAPE. In the "How well?" question, significant correlations were found with diversity (r=0.60, p>0.001) and intensity (r=0.54, p=0.002) domains. Significant correlations of "How much enjoyment?" question in the ALIP with the domains of diversity (r=0.59, p>0.001), intensity (r=0.55, p=0.002) and where (r=0.37, p=0.04) in the CAPE was found, but a significant correlation was not obtained with the enjoyment domain in the CAPE. In the "By myself?" and "With friends?" questions in the ALIP, significant correlations were found with domain of with whom (r=-0.45, p=0.01) (r=0.42, p=0.02) in the CAPE. The "With family?" question in ALIP was correlated significantly with domain of diversity (r=0.44, p=0.01) and intensity (r=0.52, p=0.003) in the CAPE (Table 6).

Table 5. Comparison of mean (standard deviation) ALIP total scores between adolescents with cerebral palsy (n=30) and healthy adolescents (n=30)

Questions	Mean (SD)		Mean difference	df	p-value
	Adolescents with CP	Healthy adolescents			
How interested?	1.83 (0.33)	1.98 (0.33)	-0.15	58	0.08
How often?	1.68 (0.23)	2.25 (0.46)	-0.57	42.5	<0.001
How well?	1.68 (0.39)	2.44 (0.33)	-0.76	58	<0.001
How much enjoy?	1.94 (0.41)	2.48 (0.3)	-0.53	58	<0.001
By myself?	30.18 (12.45)	49.68 (19.13)	-19.49	49.84	<0.001
With friends?	22.69 (14.78)	48.55 (17.35)	-25.86	58	<0.001
With family?	37.99 (17.87)	31.09 (18.99)	6.9	58	0.15

Table 6. Correlation coefficients between ALIP questions and CAPE** domains

ALIP	CAPE				
	Diversity	Intensity	With whom	Where	Enjoyment
How interested?	0.37 *	0.15	-0.02	0.09	0.50 **
How often?	0.69 ***	0.55 **	0.03	0.40 *	0.20
How well?	0.60 **	0.54 **	-0.25	0.25	0.33
How much enjoy?	0.59 ***	0.55 **	-0.20	0.37 *	0.28
By myself?	0.34	0.28	-0.45 *	-0.02	0.11
With friends?	0.05	- 0.004	0.42 *	0.35	0.03
With family?	0.44 *	0.52 **	-0.30	0.27	0.07

***p<0.001, **p<0.01, *p<0.05. ** Children's assessment of participation and enjoyment.

Discussion

The present study was sought to perform the cultural adaptation of the ALIP into Persian language and to investigate the psychometrics properties of the ALIP. This study indicated that the ALIP-P is a valid and reliable outcome measure for evaluating the leisure activities in Iranian adolescents with CP. The ALIP-P verified in the final version of the questionnaire since adolescents answered all the questions.

Ceiling and floor effects

There were no floor and ceiling effects for the total scores of the ALIP-P. The lack of floor and ceiling effects shows the validity of the ALIP-P. When participants produce the maximum or minimum possible score on a questionnaire, it represents a measuring limitation of the instrument. The presence of floor and ceiling effects reduces sensitivity and makes it impossible to detect any changes after interventions. To our knowledge, the ceiling and floor effect of the ALIP has not been investigated in other studies.

Reliability of the ALIP

Internal consistency and test-retest reliability were examined for the reliability of the ALIP.

Internal consistency

When items of a scale are homogeneous and measure different aspects of a property, it means that the

scale has a high internal consistency (21). The alpha coefficients resulting from the ALIP in this study provided evidence for high internal consistency for total scores and subscales in adolescents with CP and typically developing peers. Henry reported an alpha coefficient of 0.93 in adolescents with disabilities for the total score using the first question (that is, 'How interested?') and coefficients for subscales ranged from 0.59 to 0.80. Adolescents without disabilities reported an alpha coefficient of 0.92 for the total score using the first question and coefficients for subscales ranged from 0.58 to 0.80 (15). In this study, internal consistency for subscales was higher than the English version developed by Henry (1998) and internal consistency for the total score of the first question was similar to the published original English version. Internal consistency was high confirming that the items of the Persian version of the ALIP are homogeneous measuring the same construct.

Test-retest reliability

Test–retest reliability scores for the ALIP in this current study ranged from 0.69 to 0.95, which is slightly higher than the range of 0.68–0.78 as determined by Henry in the original reliability study on a sample of persons with disabilities (15). This could be due to the fact that only adolescents with CP participated in the current study, while children with various disabilities especially learning disabilities participated in the study of the original version.

These results confirm the ability of this tool to measure adolescent leisure interest consistently over time. Constant and stable results over time indicate that ALIP can be examined with assurance.

The SDC is computed to determine whether an individual has achieved a real change after an intervention (26). Based on the findings of the present study, a change of more than 0.22–22.78 points in the Persian version of the ALIP scores can be considered beyond the measurement error or chance variation. This implies that clinicians and researchers using the ALIP to determine the intervention effect in adolescents with CP need to observe change scores more than 0.22–22.78 points. The SEM and SDC were not reported for the original language version (15).

Discriminative validity

The ALIP in the Persian version discriminated adolescents with CP from typically developing adolescents. In the current study, similar to the study conducted by Henry, no differences were found between groups in the interest levels (15).

In most ALIP categories, typically developing adolescents participated more than adolescents with CP. Henry suggested that no significant differences were found in the participation domain between adolescents with disabilities and without disabilities (15). In the domain of participation, there was a significant difference between typically developing children and cerebral palsy that are not consistent with Henry's results. Since most participants in Henry's study had no physical limitations, they can do a lot of leisure activities. The results of other various studies show the wide impact of disability on participation rate (15). The lower participation in adolescents with CP compared to the general population of the same age is consistent with our study (27,28). Of course, no significant difference was found between the groups in participation in relaxation and intellectual activities in our study. This finding may be related to the fact that typical and cerebral palsy groups do not require physical activity or mobility to perform these activities.

There was a significant difference between the two groups in the "How well" question. Adolescents with cerebral palsy feel less competent due to their inability to participate in and perform many leisure activities properly (29,30).

A significant difference was found between the groups in the enjoyment total score. Engel-Yeger *et al* reported that no significant differences were found between the groups in the enjoyment group (27). The Engel-Yeger study used the CAPE questionnaire. Adolescents with CP spend a lot of time at home; thus, they are interested in participating in school and outdoor activities. CAPE dose not evaluate school activities, while ALIP assesses school activities and more activities than CAPE. Differences in questionnaires may be due to inconsistency between the results of the present study and the Engel-Yeger study in enjoyment domain.

There were significant differences on the "By myself?" and "With friends?" questions between the

groups in total scores, but there were no significant differences in total score on the "With family?" question. Compared to typically developing adolescents, adolescents with CP spent less time with friends and they want to stay at home. Healthy adolescents are more self-sufficient than cerebral palsy and have more independence and can do many things by themselves. The results of previous studies were similar to our results (27,28,31).

Construct validity

Construct validity was examined in terms of the convergence between ALIP and CAPE. Until now, the construct validity of the ALIP has not been investigated. In this study, the correlation coefficient between the ALIP and CAPE was obtained range from -0.45 to 0.69, indicating the acceptable correlation between most domains in these instruments. Therefore, ALIP has construct validity. Values of Pearson correlation were considered as follows: >0.75 (good to excellent); 0.50-0.75 (moderate to good); 0.25-0.50 (fair) and 0.00-0.25 (little or none) (32).

No significant relationship was found between some domains (such as enjoyment in both questionnaires) of the ALIP and domains of the CAPE. Likely, the reason for this is due to the nature of these two scales. Adolescents with cerebral palsy spend a lot of time at home, therefore they are interested in outdoor activities and environments such as school activities. CAPE does not evaluate school activities, and the ALIP questionnaire assesses school-related activities as well as more activities than the CAPE. Also, there was a high correlation between some dimensions of the questionnaire (diversity/intensity and how interested/how often/how well). It seems that the variety and intensity of activity can lead to more participation, more satisfaction, and more pleasure.

Conclusion

Identifying, planning, and participating in leisure activities is considered one of the factors in improving one's well-being. The transition from childhood to adolescence is also very critical and accompanied by many challenges, and the participation of adolescents in this occupation can make this path smoother and more enjoyable to a great extent. The results of this study indicated that the ALIP-P is a valid and reliable Persian tool for assessing the leisure activities of adolescents with cerebral palsy. Therefore, the Persian version of this questionnaire with maximum coverage of leisure activities can be used in interventions and research to identify adolescents at risk of problems related to leisure activities, and setting goals related to leisure activities.

Limitations and suggestions

In this research, due to time constraints and lack of access to qualified samples, the sample size did not reach the desired number. Therefore, this study can be considered as a pilot study and it is suggested that in future research, it should be done on more samples of cerebral palsy adolescents. Also, ALIP responsiveness was not examined, and this should be considered as a limitation in the current study. On the other hand, it is suggested that the psychometric properties of this questionnaire be performed among non-physical disabilities such as psychiatric disabilities.

Ethics Committee

The Research Council of School of Rehabilitation and the Ethics Committee of Tehran University of Medical Sciences approved the study protocol (IR.TUMS.FNM.REC.1396.4241).

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