Research Paper

The Psychometric Properties of Iranian Children's Participation Assessment Scale for Iranian Children With Attention-deficit/hyperactivity Disorder

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ABSTRACT

Objectives: Attention-deficit/hyperactivity disorder (ADHD) is highly common in children and can continue lifelong. Looking at children's participation in detail is excessively important since it affects their quality of life (QoL). The Iranian children's participation assessment scale is a questionnaire that determines children's participation and is primarily built for children with cerebral palsy. This study aims to estimate the psychometric properties of this questionnaire for children with ADHD.

Methods: The content validity was estimated using the Lawshe method with 8 occupational therapy experts (5 with a PhD and 3 with a MA degree with at least 5 years of experience). Test-retest reliability was done using an intraclass correlation class (ICC) in a two-week interval among 30 children with ADHD.

Results: Regarding content validity, CVI was found to be 1 for all items, and CVR values were between 0.75 and 1 for all items. Regarding reliability, the ICC result was 1 for all the items.

Discussion: No item was omitted in the validity part, and all items showed good reliability. The test is valid and reliable for children with ADHD.

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Highlights

• ICPAS is a valid and reliable test that can be used to measure participation among children with attention-deficit/hyperactivity disorder (ADHD).

• It is important to pay attention to children's participation.

• ICPAS has studied for physical disabilities before, and now is studied for children with ADHD.

Plain Language Summary

Assessing participation among children with mental disorders is important because gives a scientific view to parents and experts that helps them to establish proper interventions and monitor the changes. The ICPAS is a proper test for assessing participation and is proved to have good validity and reliability characteristics to get used among children with ADHD according to this study.

1. Introduction

Children's participation has different aspects. Participation is seen not only as a way of making all the decisions in one's life but it has been mentioned as a children's right too. Considering participation, an important concern in children's lives, made them the center of focus instead of being passive subjects of research [1]. Participation is one of the outcomes of occupational therapy intervention and is defined as an engagement in daily life activities [2]. Participation has different aspects and depends on several factors, such as motivation and interest [3, 4]. The difficulties in participation lead clients to occupational therapy [5].

According to the diagnostic and statistical manual of mental disorders, fifth edition (DSM-5), attention-deficit/hyperactivity disorder (ADHD) is a disorder that has three main symptoms of inattention, hyperactivity, and impulsivity. These symptoms can be seen together or separately and affect occupations [6]. After depression and anxiety, ADHD is the most common mental disorder that almost 3.4% of children and adolescents can experience worldwide [7]. The prevalence of ADHD is studied in Iran as well. It has been estimated that 4% of 6 to 18 years old children in Iran have been diagnosed with ADHD, which is relatively higher than the average world prevalence [8].

Children with ADHD face serious problems in their participation in different occupations, from activities of daily living to play and leisure activities [9]. Participation is related to the quality of life (QoL) [10]. Therefore it is crucial to assess participation carefully and have plans to increase it among children with ADHD.

Several participation measures in Persian are studied to be used among different groups. Fifty measures were introduced in a systematic review in 2020, and participation in their psychometric issues has been studied [11]. Not all of these measures are suitable for children, and some of them only cover one area of occupation. There are only 6 measures for assessing participation that is developed based on the Iranian population. There are some other tools in the world, but none of them are based on Iranian culture. The only suitable for Iranian children is the Iranian children's participation assessment scale (I-CPAS). It has two versions for parents and children and assesses all the occupation domains [11]. I-CPAS was developed in Iran, and it has many similarities with the children participation questionnaire (CPQ). CPQ studies Iranian children and covers age groups from 4 to 6 years old. As I-CPAS is designed for 6 to 12 years old children and these two tests have a great match in their structure, and both of them are developed regarding occupational therapy practice framework (OTPF), considering both as potential tests for participation is beneficial [12-15]. These tests have been used for children with cerebral palsy and cancer [14, 16]. We want to use the test for a quite different population, and these tests have not been used in children with ADHD before; however, it was studied among children with mental disorders before this study. Saljooghi et al. worked on the psychometric issues of I-CPAS for children with mental illnesses [17]. They did not study children with ADHD, so we need to run a psychometric study, including face and content validity and test-retest reliability, to make the test ready to be considered a proper tool for clinical and research purposes.

This study aimed to examine the face and content validities of I-CPAS (parents' version), as well as its test-retest reliability. As the original version was in Persian, we worked based on the same version.

2. Materials and Methods

This psychometric study was done in two major steps: the validity step and the reliability step. Regarding the validity part, occupational therapists were invited to assess the content validity. Regarding the reliability part, a total population of 30 children was included (aged 6-12 years). These children answered the questionnaire twice at a 15-day interval via electronic questionnaire.

Content validity

Regarding content validity, we invited 8 occupational therapy experts with more than 5 years of experience in mental health services. Five people in this group had a PhD in occupational therapy or were PhD candidates, and three had a Master's in occupational therapy. Using the Lawshe method, the content validity index (CVI) and the content validity ratio (CVR) were estimated. For this part, all items were prepared on a table and were studied by experts. Each item was scored in terms of its essentiality for assessing participation in children with ADHD. Three options were available for each item as the experts should answer them: it is essential, it is beneficial but not essential, and it is not essential. For assessing the CVR, the following formula (Equation 1) was used. In this formula, "N_e" denotes the number of experts who voted an item as being essential, and "N" indicates the number of experts who participated in the research [18].

$$1.\ CVR=\frac{N_e-N/2}{N/2}$$

The obtained answer will be compared to what Lawshe has introduced. According to his outcomes, each item needs a minimum score of 0.75 to remain in the questionnaire.

For the CVI part, experts scored each item for being clear, simple, and specific to the topic from 1 to 4, which shows the strongest score in 4 and the lowest score in 1. To calculate CVI, the number of experts who rated an item with 3 or 4 would be subtracted from the whole expert's number [18].

Reliability

To estimate the reliability of the questionnaire, the test-retest reliability was done. The test-retest reliability shows the consistency of a questionnaire throughout the time [19]. Thirty parents of children with ADHD participated in the study [20-22]. Using the intraclass correlation coefficients (ICC), we compared the scores in the questionnaire, completed by 30 parents of children with ADHD twice, with an interval of two weeks. The inclusion criteria were as follows: Having a confirmed diagnosis of ADHD by a psychiatrist, being 6 to 12 years old, living in Tehran, and being able to write and read in Persian for parents responsible for answering the questionnaires. The exclusion criteria were as follows: having no tendency to participate or remain in the study and having any major mental (like Autism spectrum disorder or Down syndrome and so on) or neurological diseases (like cerebral palsy).

3. Results

Validity

Regarding the validity part, 8 experts took part. All the items asked in the I-CPAS are brought in Table 1. As shown, all items scored 1 for the CVI part. In the CVR, parts 54, 62, 64, and 67 scored 0.75, and other items got 1. Table 2 presents the CVR values according to Lawshe's definition. This table indicates that scores higher than 0.75 would be considered acceptable in terms of validity. Therefore, all items remained in the questionnaire, and no item was added.

Reliability

In this study, the test-retest reliability was used to determine the reliability of the I-CPAS. Thirty children entered the study, but two could not participate in the re-test due to infection with COVID-19. They were excluded from the study, and 28 children stayed in the study, and their parents completed the test after two weeks. The absolute agreement and 2-way random were used. The ICC was calculated between the test and re-test and is presented in Table 3. According to Munro, If ICC is higher than 0.8, the reliability is very good, between 0.79 and 0.8 is medium, and less than 0.6 is poor [23]. The ICC values show very good reliability in all dimensions of I-CPAS.

Table 1. Validity of I-CPAS for children with attention-deficit/hyperactivity disorder

	Items	CVI	CVR
Basic activities of daily living	1. Bathing in their house	1	1
	2. Combing	1	1
	3. Brushing	1	1
	4. Putting on and taking off the shoes	1	1
	5. Washing hands and face	1	1
	6. Choosing food over the table or tablecloth	1	1
	7. Going to the toilet in their home	1	1
	8. Going to the toilet in places other than their home	1	1
	9. Selecting, wearing, and taking off the upper and lower body clothes	1	1
	10. Wearing, taking off, and preserving the accessories (eyeglasses, earphones, contact lenses, etc.)	1	1
	11. Using the tableware over the table or tablecloth	1	1
Instrumental activities of daily living	12. Making Sandwiches/ mouthfuls	1	1
	13. Using kitchen appliances for food preparation (crushing, making, and heating food)	1	1
	14. Using Telephone/mobile at home, out of the house, and using public phones/payphones	1	1
	15. Using audio and visual instruments (such as radio, television, computer, mp4, etc.)	1	1
	16. Helping in preparing the meal and setting the table or tablecloth	1	1
	17. Shopping	1	1
	18. Using public transportation (such as taxi, bus, metro)	1	1
	19. Cleaning and organizing their rooms and personal spaces (personal wardrobes, personal drawers, etc.)	1	1
	20. Participating in the activities associated with organizing and cleaning the house (such as dusting, sweeping using a vacuum cleaner or broom)	1	1
	21. Preparing their bag for school or other classes.	1	1
Play	22. Participating in board games (such as Mensch ärgere Dich nicht, chess, card games, Mind Games, etc.)	1	1
	23. Jumping games (such as hopscotch, rope jumping, etc.)	1	1
	24. Games using musical instruments (such as flute, drums, Jingle Bells, etc.)	1	1
	25. Sports and games using balls (such as football, volleyball, basketball, etc.)	1	1
	26. Racquet sports (such as table tennis, badminton, tennis, etc.)	1	1
	27. Games using skates, bicycles, and scooters.	1	1
	28. Ball games (dodgeball, etc.)	1	1
	29. Running games (a game of tag, chasing games, running, hides and seek, etc.)	1	1
	30. Playing with building toys (like puzzles, building blocks, and Lego)	1	1
	31. Playing computer or video games (like PlayStation and x-box, etc.)	1	1
	32. Playing simulated or imaginative games (e.g. role-playing games, having the role of teachers, doctors, and aunts)	1	1
	33. Water games (swimming, dabbling, etc.)	1	1
	34. Games in the Park (such as swings, slides, see-saw, etc.)	1	1

	Items	CVI	CVR
Leisure activities	35. Going on a picnic	1	1
	36. Going to the park and amusement parks	1	1
	37. Going to the place of worship and going on a pilgrimage (such as a mosque, shrine, etc.)	1	1
	38. Watching TV or CD	1	1
	39. Designing, painting, and coloring, or making crafts and artworks.	1	1
	40. Gathering things for collections (such as coin, stamps, erasers, cards, etc.)	1	1
	41. Letter writing (by hand on paper or electronically)	1	1
	42. Going for a walk or climbing mountains	1	1
	43. Non-major studies (such as newspapers and books)	1	1
	44. Engaging in favorite activities related to housekeeping	1	1
	45. Going to the restaurants	1	1
	46. Visiting your kin and friends	1	1
	47. Dancing	1	1
	48. Hanging out with friends	1	1
	49. Listening to the stories	1	1
	50. Participating in artistic and cultural activities (such as ceramics and pottery, storytelling, poetry reading, calligraphy, drama, etc.)	1	1
Social participation	51. Participating in a friend's birthday party	1	1
	52. Attending school ceremonies (Iftar, food festivals, Yalda, Secretions, etc.)	1	1
	53. Going to parties	1	1
	54. Sleeping in relatives'/friends' house	1	0.75
	55. Inviting friends home	1	1
	56. Go to a friend's home	1	1
	57. Talking on the phone to get things done (contact schools, institutions, clubs, classmates, etc.)	1	1
	58. Visiting people (patients, teachers, managers, etc.)	1	1
	59. Involvement in social institutions (public libraries, cultural centers, the Center for Intellectual Development, local homes, etc.)	1	1
	60. Participation in extracurricular activities of the school held in groups (such as the Quran class, song groups, theatre groups, etc.)	1	1
	61. Going to the cinema	1	1
	62. Going to live performances (including concerts, theater, etc.)	1	0.75

	Items	CVI	CVR
Educational activities	63. Attending art classes (singing, music, drama classes, etc.)	1	1
	64. Having a private tutor (for school work, art projects, etc.)	1	0.75
	65. Participating in classes other than sports and art (such as language, Quran, computers, robotics, social skills, etc.)	1	1
	66. Attending exercise classes outside of school	1	1
Work	67. Doing paid work	1	0.75
	68. Doing homework and other school assignments	1	1
Sleep/rest	69. Sleeping	1	1
	70. Preparing for sleep (making the bed, brushing, wearing comfortable clothes, etc.)	1	1
	71. Resting (knowing the rest time, doing anything to restore the atrophied energy such as lying, showering, yoga, etc.)	1	1

CVR: Content validity ratio; CVI: Content validity index.

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4. Discussion

Attention-deficit/hyperactivity disorder is a common disorder in childhood and affects children's participation and many areas of their lives. Knowing the exact damage of any health issue is always important to provide a proper and beneficial intervention. The I-CPAS is an Iranian test for evaluating participation in children. The test was initially developed for patients with cerebral palsy. In this project, the main purpose was to assess this test's psychometric properties for children with ADHD.

Table 2. Content validity ratio (CVR) crucial scores

Number of Experts	CVR Cut-off Score
5	0.99
6	0.99
7	0.99
8	0.75
9	0.78
10	0.62
11	0.59
12	0.56
13	0.54
14	0.51
15	0.49
20	0.42
25	0.37
30	0.33
40	0.29

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Table 3. The test-retest reliability (ICC, n=28) of the participation dimensions for each occupational area

Occupations	Number of Items	Diversity	Frequency	With whom	Enjoyment	Parent satisfaction
Total measure	71	0.999(0.991-1)	1(0.999-1)	1(0.999-1)	1(0.999-1)	0.999(0.999-1)
The activity of daily living	11	0.989(0.976-0.995)	1(0.999-1)	0.998(0.995-0.999)	0.999(0.998-0.999)	0.997(0.994-0.999)
Instrumental activity of daily living	10	1(0.999-1)	1(0.999-1)	0.999(0.998-1)	0.998(0.995-0.999)	0.999(0.998-1)
Play	13	1(0.999-1)	0.999(0.998-1)	1(0.995-1)	1(0.996-1)	1(0.996-1)
Leisure	16	0.997(0.993-0.999)	0.997(0.994-0.999)	0.996(0.992-0.998)	0.999(0.998-1)	0.994(0.988-0.997)
Social participation	12	1(0.997-1)	1(0.996-1)	1(0.996-1)	1(0.997-1)	1(0.999-1)
Education	4	0.992(0.982-0.996)	0.998(0.996-0.999)	0.997(0.993-0.999)	0.999(0.997-0.999)	1(0.999-1)
Work	2	1(0.998-1)	1(0.998-1)	1(0.997-1)	1(0.997-1)	1 (0.999-1)
Sleep/rest	3	1(0.999-1)	1(0.999-1)	1(0.998-1)	1(0.997-1)	1(0.996-1)

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As this test was in Persian, no translation was needed. The first step was studying the content validity that showed good validity as experts ranked items. Regarding the validity part, no item was deleted. Although some comments on changing words were made, the test passed the validity test. These results were like other studies on children with cerebral palsy and cancer [12, 15, 16, 24].

Regarding the reliability part, all items were stable during the time. The ICC value was 1 for all items. This test also offered great test-retest reliability in other studies [12, 15, 16, 24]. I-CPAS showed good reliability for children with cerebral palsy, cancer, and other mental conditions. Although some participation scales exist for children with ADHD, none consider all the areas of participation in OTPF. For example, household task participation is assessed independently [9], and sports participation is studied in a different study [25]. Therefore I-CPAS sounds like a proper choice to evaluate the whole area of involvement among children with ADHD.

5. Conclusion

I-CPAS is a valid and reliable test for children with attention deficit with or without hyperactivity disorder and can be applied in clinical and research situations.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of the University of Social Welfare and Rehabilitation Sciences (Code: IR.USWR.REC.1398.079).

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Authors' contributions

All authors equally contributed to preparing this article.

Conflict of interest

The authors declared no conflict of interest.

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