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ORIGINAL ARTICLE

Translation and Validation of Edinburgh Handedness Inventory in Urdu Language for Cerebral Palsy

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ABSTRACT

Aim: To translate and validate EHI in Urdu language.
Methods: Non-probability convenient sampling approaches used in a descriptive cross-cultural validation research design. The study also included twenty parents of children with cerebral palsy and specialists in pediatric rehabilitation. An English professor or physician completed the back translation, while two separate multilingual translators translated EHI forward into Urdu. These translators were proficient in both Urdu and English. An expert panel committee created and approved the final version of EHI in Urdu. The consent of the guardian acquired beforehand, and confidentiality ensured. The SPSS version 21 used to input and analyzes the data, and a pretest sample of 150 people used[1].
Result: For reliability statistics, the mean age of participants was 40.4 with standard deviation of 15.994 and Cronbach alpha of EHI questionnaire after translation was 0.943 or after testing on parents of cerebral palsy patients was 0.964 andcontent validity also showed good content validity ratio which was 0.72. Pearson correlation showed an excellent test-retest reliability and internal consistency 0.946 and after testing intraclass correlation varied from 0.523 to 0.956-show high reliability respectively.
Conclusion: The Urdu version of EHI is a valid and reliable tool for Urdu speaking population of Pakistan.
Keywords: Cerebral palsy, Edinburgh handedness inventory, Ghurki trust teaching hospital, Lahore College of physical therapy

INTRODUCTION

When doing a task, a person's constant inclination or desire to use one hand rather than the other is referred to as handedness. Handedness reveals a person's habitual preference for acting with one hand, but it is not the same as having a strong asymmetry in dexterity, or the ability to do skilled hand activities[2]. For neuropsychologists who work in more culturally varied contexts, hand dexterity is still a factor to consider. Handedness is a broad term that refers to a wide range of neurological and behavioral processes, genetic as well as environmental factors. However before delving more into these cultural occurrences, the methodological challenge of measuring handedness and its impacts must be addressed. Edinburgh Handedness Inventory is the most widely used in handedness from others questionnaire. The EHI has the advantage of being a quick and easy way to assess laterality on a quantitative basis; it was developed by Richard Charles in 1971 to assess activities of daily living. Several researches have looked into the reliability of the English version of the EHI, and it has shown to have good measuring qualities, with a test–retest reliability of 0.97. Cronbach alpha and acceptable internal consistency from 0.93 to 0.96, values were reported[3].

The original version of the Oldfield Inventory was based on a 20-item modified version of the Humphrey inventory. There is evidence that the original instructions and answer format were confusing, and that they featured questionable issues. The mostly used version of Oldfield inventory contain 10 item**s** related handedness including 10 motor tasks (writing, drawing, throwing, scissors, toothbrush, knife (without fork), broom (upper hand), striking match (match), opening box (lid)[4].

Cerebral palsy children represent asymmetric weakness of upper extremity is characteristically seen in hemiplegics and left handedness is seen when the topographical pattern of involvement in right hemiplegic[5]. CP can be defined as group of permanent disorder of development of movement and posture causing activity limitation or CP can defined as A group of permanent disorder group of permanent disorders of movement and posture, causing activity limitation, that are attributed to non-progressive disturbances that occurred in the developing fetal or immature brain[6].

The current literature regarding the use of EHI in hemiplegic cerebral palsy was missing or lack of translation in Urdu version, so the study aims to translate this tool into Urdu language for parents who are unable to understand or use EHI Questionnaire to identify whether their child has cerebral palsy with risk of left-handedness. This screening will help to develop awareness and encourage performing activities of daily living with right hand

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MATERIAL AND METHODS

The approval had taken via email from Richard Charles for the Urdu translation of EHI. The translation and the cross-cultural modification of EHI in the Urdu language were executed using five steps in compliance with previously published guidelines and in accordance with international guidelines[7]. This research was ethically approved by the Committee of Lahore College of Physical Therapy, LMDC.

Stage1: Forward Translation: The translation of EHI was done by two native Urdu-speaking Pakistani translators.One of them was a medical doctor who was aware of the concept of this study, and the other was a native translator with foreign Nationality[8].

Stage2: Synthesis: During this step, the original version of the scale along with translations 1 (T1) and 2 (T2) were synthesized to obtain a common translation version (T-12).Urdu. The full Urdu translation of EHI (T-12) was completed at this stage[9].

Stage 3: Backward Translation: At this stage, the back translation of the Urdu-translated version into the Englishlanguage managed. For this purpose, the help of two bilingual translators was taken. both were native translator and both had great command in Urdu and English Language[10].

Stage 4: Expert Review: The expert committee's role was to consolidate all the versions of the questionnaire and develop and considered the pre-final version of the questionnaire for field-testing. As the committee of 10-20 Pediatric rehabilitation specialists was already aware of the purpose of the study, they compared both of the versions. After comparing the Urdu and English versions of the scale, it was further updated and edited by the members of the committee[11].

Stage 5: Pretesting: The pre-final translated version of EHI, both English, Urdu, was then tested, and full psychometric testing of EHI was done in a sample of 150. Consent was taking from parents before testing. The expert committee of 10-20 Pediatric rehabilitation specialists then evaluated these findings[12].

RESULTS

Age of the patient: For reliability statistics**,** The Average age of participants was 12.5 and Cronbach alpha of translated version of EHI is 0.943

Content validity:

Cronbach's Alpha	N of Items
.943	40

The formula of content validity ratio **is CVR= (N_e - N/2)/(N/2),** in which the N_e is the number of panelists indicating "essential" and N is the total number of panelists. It can be measure between -1and 1, the closer the CVR to 1, so the items content validity was 0.72.

Items	Experts in Agreement	Content Validity Index	Content Validity Ratio
Writing	8	0.8	0.6
Drawing	9	0.9	0.8
Throwing	9	0.9	0.8
Scissors	8	0.8	0.6
Toothbrush	10	1	1
Knife	7	0.7	0.4
Spoon	10	1	1
Broom	8	0.8	0.6
Striking a match	8	0.8	0.6
Opening a box	9	0.9	0.8
	0.86	0.86	0.72

Reliability: Internal consistency The Cronbach alpha ofquestionnaire EHI after population testing was 0.964.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.9**64**	.962	20

Test-retest reliability: The Test retest Reliability by Pearson correlation ranged from 0.415 to 0.964.

Domain	Writing	Drawing	Throwing	Scissor	Tooth brush	Knife	Spoon	Broom	Striking a match	Opening a box
Pearson Correlation	.964	.941	.852	.864	.864	.835	.807	.741	.770	.415
Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
N	150	150	150	150	150	150	150	150	150	150

Intra-rater and inter-rater reliability The intra class correlation coefficient value 0.5 to 0.9 showed high reliability

	Intra class Correlation	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.523	.457	.592	28.130	149	2831	.000
Average Measures	.956	.944	.967	28.130	149	2831	.000

DISCUSSION

The purpose of current study was to complete formal Urdu translation of the EHI, validate the translated version and test its basic psychometric properties. The results of the study of 10 items provide evidence of excellent goodness of fitness indicators very high internal consistency and convergent validity. Previous studies showed that, it is valid tool to measure handedness among university students, and beneficial for research in those communities who can speak Spanish[2].

Previous studies showed the Turkish version of the EHI has proven to be a valid and reliable instrument to assess hand preference in young healthy adults. It also provides information regarding both the direction and degree of hand preference, but my study showed that Urdu version of EHI has also proven that valid and reliable to assess in children with cerebral palsy. The test-retest reliability of the EHI showed an excellent correlation 0.912 and current study showed an excellent correlation by Pearson correlation coefficient method 0.964[13].

The Chinese versions of the EHI, underwent a standardized process of translation, back translation, the results showed that the Cronbach's alpha coefficient of internal consistency was 0.877 for the translated EHI. test and re-test reliability after a 30-day interval. The intra-class correlation coefficients showed high reliability, 0.898 for the translated EHI [(3)]and current study also showed an excellent correlation by Pearson correlation coefficient method 0.964 and high reliability showed by intra class correlation coefficient with 3 to 7 days interval.

The purpose of this study was to investigate the psychometric properties of the Edinburgh Handedness Inventory (EHI) from the descriptive statistics, we observed only two left-handed [(14)]participants in our sampled that low numbers of left-handers could be explicable by cultural and biological differences among samples. The reliability and temporal reliability of EHI were adequate so Cronbach's alpha was 0.877. This value is considered good for research purposes Through t-test it was found that there were no statistically significant differences for the EHI LQ t=(24) = 0.37; p> .05. Pearson correlations confirmed a high positive correlation (r = 0.97; p< .001) (Espírito-Santo et al., 2017)and current study also showed an excellent correlation by Pearson correlation coefficient method 0.946.and through t test it was found that there no statistically significant difference 0.9 ;p>.05 and Cronbach alpha was 0.964.

This study was case control among diplegic cerebral palsy and normal children to assessed handedness based on just three functions (writing, feeding and throwing), A proportion of children with cerebral palsy may not have been able to comprehend some instructions or co-operate appropriately. Some of the children included in these studies could potentially have had cerebral palsy, although that was not clearly stated it reported high prevalence of left-handedness in children with athetoid cerebral pals. Awareness that children with cerebral diplegia have a high chance of being left-handed will enable that the treating physician to counsel parents to perform activities-of-daily-living with the right hand if the child turns out to be left-handed[5] and current study of validation among hemiplegic cerebral palsy with 150 sample of children with 55%right-handed and 5% left-handed.

The current study showed that Urdu adaptation of original EHI has acceptable internal consistency exhibited by Cronbach alpha value 0.964. The test-retest reliability ranged from 0.415 to 0.964. The summary of inter item correlation statistics was 1.976 reflecting it to be good. This Urdu version can be used to assess hand preference and impaired fine motor activities in cerebral palsy children. After applying the translated version on population, the reliability was analyzed giving acceptable Cronbach alpha value 0.943.and content validity ratio 0.72.

CONCLUSION

The Urdu version of Edinburgh Handedness Inventory Questionnaire exhibits acceptable internal consistency or test-retest reliability and good content validity as determined by expert panel after forward or backward translation of original version of Edinburgh Handedness Inventory Questionnaire

Authorship and contribution declaration: Each author of this article fulfilled following Criteria of Authorship:

1. Conception and design of or acquisition of data or analysis and interpretation of data.
2. Drafting the manuscript or revising it critically for important intellectual content.
3. Final approval of the version for publication.

All authors agree to be responsible for all aspects of their research work.

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