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## Translation and Psychometric Analysis of Urdu Version of Katz Index of Independence in Activities of Daily Living in Older Adults

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### Abstract

**Purpose:** To translate the Katz index from English to Urdu and to establish its validity and reliability in older individuals.

**Methodology:** A cross sectional study was done in which the Katz index was adapted cross culturally after translated in Urdu. The elder adults of Wazirabad were the source of the data. The technique utilized was non-probability convenience sampling. Participants 60 years of age and older were included. For the translation Beaton guidelines were followed. The whole procedure of translation was done under the guidance of expert panel. Data were collected from the 102 older adults through the Urdu version of Katz index and Urdu version of Barthel index for association. Consent was taken from each participant. Data analysis was carried out using IBM SPSS 20 and was presented through tables and graphs.

**Findings:** Among 102 participants, 67 females (65.7%) and 35 males (34.3%) were included. Their mean age was 68 with the standard deviation of 7.02. Cronbach's alpha value was 0.754 which indicates the good internal consistency of Urdu version of Katz index. The intra class correlation coefficient for the translated version was ICC 0.994(95%CI: 0.994-0.997). The correlation value  $r=0.953$ ,  $p<0.01$  shows its strong association with Urdu version of Barthel index indicating that the Urdu Katz index has good convergent validity.

**Recommendations:** The Katz index scale's Urdu version was found to be valid, accurate, reliable, and trustworthy. It can be extensively used by practitioners.

**Keywords:** Functional Status, Katz, ADL, Older Adults, Reliability, Validity

## 1.0 INTRODUCTION

The functional state of a person provides insight into their overall health. It demonstrates a person's ability to engage in the interactions with others and physical activity necessary to maintain regular lifestyles and self-care. Bathing, dressing, grooming, transferring, maintain continence, feeding, and toileting are all BADLs. IADLs include more complex tasks like managing money, using a phone, food preparation, doing the laundry, going purchasing goods, driving or making use of public transport, taking meds. A greater level of mental abilities and participation in community responsibilities are required for AADLs, which include work-related, recreational, and travel activities: <sup>(1)</sup>

Independence is lost as functional capacities decline with age. The earliest indication of an underlying illness could be a functional status impairment. Therefore, a crucial part of geriatric assessment is comprehending the functional state. To assess functional state, multiple scales were developed and are in use. The Katz ADL is the most well-known and often utilized BADL assessment tool in clinical studies and clinical practice. Katz et al. created the Katz ADL in the early 1960s. <sup>(2)</sup>

Each of the ADL index subcategories show the sum of activities as a numerical expression, which summarizes the various areas of reliance. Bathing, dressing, toileting, transferring, continence, and feeding are the six ADL functions measured by this scale. The degree of independence or dependency displayed by the patient essentially serves as a classification of that person based on the level of assistance required to execute a task <sup>(3)</sup>

Upon a dichotomous (yes-or-no) scale, the minimum score is 0, which indicates that the patient needs assistance with every activity, and the maximum score is 6, which indicates independence in all ADLs <sup>(4)</sup>. By summing the results from the six categories, the functional reliance degree of an older person can be classified as self-independent (6 points), slightly dependent (three-five points), or completely dependent (two points) <sup>(5)</sup>. According to the (WHO), the percentage of people over 60 in the world is set to double between the years 2015 and 2050, going from 12% to 22% <sup>(6)</sup>ADL reliance in older persons is substantially correlated with or predisposed by age, gender, and diseases <sup>(3)</sup>

In older persons, the process of developing a disability, the inability to carry out daily tasks owing to a mental or physical issue, is often a dynamic one that results from numerous setbacks over time <sup>(7)</sup> Reliability values ranging from a value of 0.87 to 0.94 show that the Katz index shows strong reliability. <sup>(4)</sup> This scale has been translated to Turkish <sup>(1)</sup> Spanish <sup>(8)</sup> Persian <sup>(9)</sup> Brazilian <sup>(10)</sup> Swedish <sup>(11)</sup> Greek <sup>(12)</sup> Chinese <sup>(5)</sup> and Sinhala language in Sri Lanka <sup>(13)</sup>

Our culture has a big impact on how we behave. Like in Pakistan, Urdu is spoken and understood by the vast majority of people. As a result, there must be a tremendous necessity for reliable and verified scales that may be utilized in both clinical practice and research. The study's focus was to determine the accuracy and dependability of Katz ADL scale in Urdu. When analyzing Urdu-speaking impaired individuals, it aids and provides our doctors with a new instrument to measure the impairment.

In Pakistan, there is the lack of culturally adapted questionnaires. Although the Barthel index <sup>(14)</sup> has been adapted and validated previously but only this questionnaire is not enough to assess the physical activities of older adults. So, the current study was done to check the validity and reliability of the Urdu version of Katz index to provide an additional tool for the physical

functional assessment in the field of research and clinical set ups for the care of older people in Pakistan.

## 2.0 METHODOLOGY

This cross sectional study was carried out from March 2023 to July 2023 on community dwelling older adults of Wazirabad. The ethical approval from institutional review board (ref: REG/GRT/23/AHS-122) was obtained. The sample size was 102 calculated through the rule of thumb<sup>(15)</sup>. Participants aged 60 and above who read and understand the Urdu and those whose Hodkinson's mental test score  $>8$  were included in the study. People with fractures and amputation six months ago and people who had stroke from last 2 years were excluded from the study. Hodkinson abbreviated mental score<sup>(16)</sup> was used to assess the cognition level of all the participants. Because decrease in cognition level might cause poor decision making. Urdu version of Barthel index<sup>(14)</sup> was also administered along with the translated Katz index. After 48 hours data was again collected from the same participants under same conditions.

### Cross Culture Adaptation of Katz Index

For the translation procedure Beaton guidelines were used.<sup>(17)</sup> The two qualified translators translated Katz Index's English version into the intended (Urdu) language for the forward translation. Both translators had a background knowledge of the Urdu language. Two forward translations T1 and T2 were then synthesized and resulted into another translation T-12. The English linguistic specialist converted the T-12 version of the scale back into Urdu. This translator was totally deaf to the scale's original version. This procedure was carried out to ensure that the content of the original Katz index scale was appropriately mirrored in the revised version of the scale. The written consent was obtained from all the committee members. The qualified review committee of writers, which consists of all the translators and senior physical therapists, identified, purged, and edited the contradictions and inconsistencies in translated versions of the Katz index scale. And following the committee's examination, a pre-final Urdu version of the Katz index was produced.

This pre-final version of Urdu Katz index was administered to 20 number of participants. Each participant was guided about the scale and asked to fill it. Any word that they were not fully understand was asked to be highlighted. After taking their comments and the advice of the expert committee into account, the Katz index scale's Urdu edition was developed.

Data analysis was carried out using IBM SPSS 20. The descriptive statistics of the study was expressed through the mean and standard deviation. The internal consistency of the Katz Index in the Urdu version was assessed using Cronbach's alpha. Using Pearson's correlation coefficient (r), the association's strength and direction were evaluated. The data presentation was done through the tables and figures to convey the findings in a clear and concise manner.

## 3.0 FINDINGS

In this study, among 102 participants mean age was 68 with the standard deviation of 7.02. Total 67 females (65.7%) and 35 males (34.3%) were included. The mean Katz score was computed as 4.75 with the standard deviation of 1.57. The Participants who's HMT score was 8 and above were included in the study. Among 102 participants, there were 65 (66.3%) persons with 9 score, 26 (26.52%) persons with 8 score and 11 (11.22%) persons with 10 score in HMT Report as shown in figure-1.

**HMT CHART SHOWING SCORE OF PARTICIPANTS**

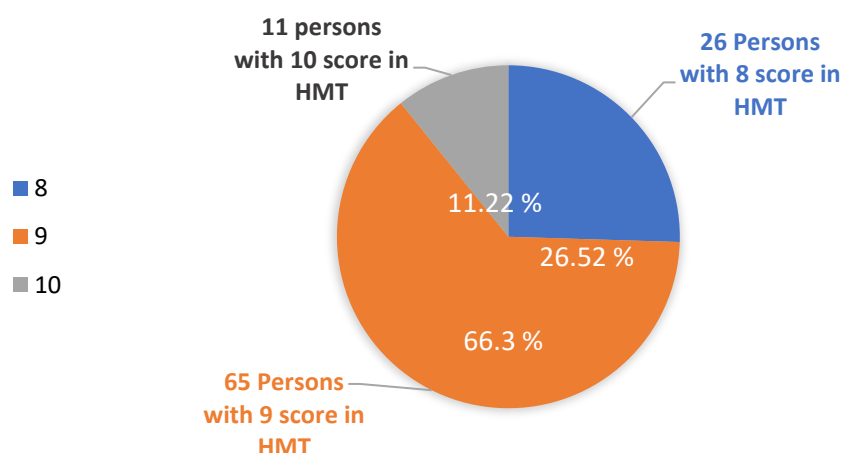


Figure 1: HMT Score

**Psychometric Analysis of Urdu Version of Katz Index**

**Internal consistency:** Cronbach’s alpha value was 0.754 which shows the good internal consistency of Urdu version of Katz index as shown in Table 1.

**Table 1: Reliability Statistics**

Cronbach's Alpha	No of Items
.754	6

Test retest reliability: For the test-retest reliability, the scale was again administered to the same participants after 48 hours. ICC 0.994(95%CI: 0.994-0.997) this value shows excellent test retest reliability in Table 2.

**Table 2: Intraclass correlation coefficient**

	Intraclass Correlation <sup>b</sup>	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.994 <sup>a</sup>	.991	.996	341.875	101	101	.000
Average Measures	.997 <sup>c</sup>	.996	.998	341.875	101	101	.000

Convergent Validity: For validity findings, we used Pearson correlation to check the association between the Urdu Katz index and Urdu Barthel index. In Table 3, strong correlation  $r = 0.953$ ,  $p < 0.01$  with Urdu BI showed significant association of two scales.

**Table 3: Correlations of KI and BI.**



Measurement tool	Correlation “r”	P value
Urdu Barthel index	0.953	<0.01

Table 4 shows the item-total correlation. In regard to correlation analysis, each item showed a positive correlation with the scale’s overall score. This also indicates that each item is moving in the same direction, related and measuring the same concept.

**Table 4: Item-total Correlation of Urdu version of Katz index (n=102)**

Items	Correlation ‘r’
Bathing	.676
Dressing	.744
Toileting	.698
Transferring	.785
Continence	.714
Feeding	.294

p= <0.01

### Discussion

The Katz Index was translated into Urdu as this study's aim, and its accuracy and validity in assessing participants' typical activities of daily living (ADL) were examined. Interesting conclusions were drawn from the study of the data from 102 individuals. There were significantly more women in the study's sample than men, according to the participants' demographics with 67 females (65.7%) and 35 males (34.3%). We saw a 100% participation rate for the participants know of the Katz Index in Urdu. This result implies that the translation procedure succeeded in preserving the key points of the actual English version, allowing the participants to understand and react to the ADL items correctly.

Our study’s population was community dwelling older adults of age 60 and above having HMT score greater than 8. The Cronbach's alpha value of 0.754 indicates that the scale items translated for measurement are consistently assessing the same underlying concept, and the Urdu version exhibits satisfactory reliability for assessing ADL. We obtained excellent ICC value of 0.997,  $p = < 0.01$ . These findings show that the Katz Index in Urdu gives consistent assessments of ADL across various metric units, increasing the trust in its use as an evaluation instrument.

Cronbach alpha value for Turkish version has been reported as 0.838<sup>(1)</sup>, for Brazilian version 0.9705<sup>(10)</sup>, for Persian version 0.79<sup>(9)</sup>, for Sinhala version 0.82<sup>(13)</sup>. In regard to our correlation analysis, bathing (r=0.676), dressing (r=0.744), using the toilet (r=0.698), transferring (r=0.785), maintaining continence (r=0.714), and feeding (r=0.294) all showed favorable correlations.

It is significant to notice that compared to the other factors, the correlation coefficient regarding feeding was substantially lower. This conclusion would suggest that further research is needed to understand how the participant's answers were influenced by the original language of the feeding product or the cultural environment surrounding feeding.

Overall, the results of this multilingual study show that the Katz Index translated into Urdu is valid and reliable for determining ADL amongst the study Index translated into Urdu, future study should try to reproduce these results using bigger and more varied samples. Additionally, examining the cultural nuances that might affect ADL actions, especially in the feeding area, could improve the translation and guarantee its applicability to the intended audience

#### **4.0 CONCLUSION AND RECOMMENDATIONS**

##### **Conclusion**

This translational study demonstrates the validity and reliability of the Katz Index in assessing ADL among the research's participants and offers insightful information about the Urdu translation of the Katz Index. The results advance the usage of the Urdu version in healthcare settings and in studies involving Urdu-speakers and add to the body of information in the field of practical evaluation.

##### **Recommendations**

- Other scales for checking dependence of activities of daily living should also be translated in Urdu.
- Urdu version of Katz index should be used in clinics for better assessment from patient's routine.

##### **Conflicts of Interest**

The authors report no conflicts of interest.

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