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Validation of Katz index of independence in activities of daily living in Turkish older adults

Gunes Arik[a,*], Hacer Dogan Varan[a], Burcu Balam Yavuz[a], Erdem Karabulut[b], Ozgur Kara[a], Mustafa Kemal Kilic[a], Muhammet Cemal Kizilarslanoglu[a], Fatih Sumer[a], Mehmet Emin Kuyumcu[a], Yusuf Yesil[a], Meltem Halil[a], Mustafa Cankurtaran[a]

[a] Hacettepe University, Department of Internal Medicine, Division of Geriatric Medicine, Ankara, Turkey
[b] Hacettepe University Medical School, Department of Biostatistics, Ankara, Turkey

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ABSTRACT

Objective: Katz Index of Independence in Activities of Daily Living Scale (Katz ADL) is a widely used tool to assess the level of independency in older adults. The objective of this study was to assess the validity and reliability of the Turkish version of the six item Katz ADL in geriatric patients aged 65 years and older.
Methods: The participants were recruited in a geriatric medicine outpatient clinic ($n = 211$). The Katz ADL was translated to Turkish and it was administered with the Barthel index (BI) and SF-36 physical functioning subscale (SF-36 PF) which are already validated in Turkish. Reliability was assessed by internal consistency, interrater and test–retest analysis. Construct validity was assessed by Spearman correlations between the Katz ADL and other functional status indices.
Results: The internal consistency was high (Cronbach's $\alpha = 0.838$). The test–retest reliability and inter-rater reliability were excellent (ICC 0.999 [0.999–1.000 95% CI]). Regarding the convergent validity strong associations between Katz ADL, BI and SF-36 PF were demonstrated ($r_s = 0.988$, $p < 0.001$ and $r_s = 0.674$, $p < 0.001$).
Conclusion: Validating an instrument, which has originally been developed in a different culture, is a complex but neccessary task. It provides an opportunity for comparison of information across different cultures. To our knowledge, this is the only study to demonstrate reliability and validity of the Katz ADL-six item version in the geriatric population living in Turkey. Turkish version of the Katz ADL is a valid and reliable scale to detect the disability status in the basic activities of daily living in older adults.

1. Introduction

Functional status of a person is a measure of his or her overall health. Functional status reflects the ability of an individual to perform the physical and social tasks necessary for maintaining self-care and usual daily activities. Functional status is determined by three levels of activities: basic activities of daily living (BADLs), instrumental activities of daily living (IADLs) and advanced activities of daily living (AADLs). BADLs include bathing, grooming, dressing, toileting, transferring, maintaining continence, and feeding. IADLs include higher level activities such as handling finances, using the telephone, doing housework, driving or using public transportation, taking medications, preparing meals, doing laundry and shopping. AADLs include occupational, recreational, and travel activities requiring a higher level of cognitive functioning and involvement in the community roles (Katz, Downs, Cash, & Grotz, 1970; Katz, Ford, Moskowitz, Jackson, & Jaffe, 1963; Lawton & Brody, 1969; Mahoney & Barthel, 1965). Decline in functional abilities with aging leads to loss of independence. Impairment of functional status could be the first sign of a disease process. Therefore, understanding the functional status is an important component of geriatric assessment. Many scales have been developed and used to determine functional status. Among instruments used to assess BADLs, Katz ADL is the best known one in clinical practice and the most widely used one in clinical studies.The Katz ADL was developed by Katz et al. in 1960s (Katz et al., 1970, 1963). It has been used with community dwelling older

Abbreviations: Katz ADL, Katz index of independence in activities of daily living scale; BI, Barthel index; SF-36, the medical outcomes study 36 item short form; SF-36 PF, SF-36 physical functioning subscale; BADLs, basic activities of daily living; IADLs, instrumental activities of daily living; LB-IADLs, Lawton–Brody IADLs; AADLs, advanced activities of daily living; MMSE, mini-mental state examination; GDS, geriatric depression scale; MNA-sf, mini-nutritional assessment short form; CHD, coronary heart disease; CHF, congestive heart failure.

* Corresponding author.
E-mail address: guneseken@yahoo.com (G. Arik).

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adults. The Katz ADL measures self-care tasks including; bathing, dressing, toileting, transferring to and from a chair, maintaining continence and feeding. The six item Katz ADL is short and can be administered by interview. However, when caring for the older adults, administering Katz ADL may require special training or clinical experience in certain cases. Especially, cognitively impaired individuals require more extensive evaluation. Therefore functional assessment can sometimes be very challenging in geriatric population.

Another scale for BADLs is the Barthel index (BI). It was first developed by Mahoney and Barthel (1965). The validity and reliability of the Turkish version of the BI was assesed by Kucukdeveci et al. (2000) in patients with stroke and spinal cord injury. The medical outcomes study 36 item short form (SF-36) is a measure of quality of life and health status (McHorney, Ware, Lu, & Sherbourne, 1994; Tarlov et al., 1989). It measures eight health domains: physical functioning, role limitation due to physical problems, bodily pain, general health perception, vitality, social functioning, role limitation due to emotional problems and mental health. The validity of SF-36 item was assessed by previous studies in general population (Brazier et al., 1992). The reliability and construct validity of SF-36 was assessed in Turkish cancer patients by Pinar (2005).

The Katz ADL is a commonly used tool but the Turkish version of this scale had not been proven to be reliable and valid for the older adults living in Turkey. Although it is frequently used, evidence on its reliability and validity are scarce, with existing data mostly coming from studies focusing on the interrater reliability(McDowell, 2006; Reuben, Valle, Hays, & Siu, 1995; Rodgers & Miller, 1997). In case of cultural validity Reijneveld et al. demonstrated good internal consistencies (Cronbach's alphas: 0.84–0.94) for Dutch, Turkish, and Moroccans living in the Netherlands in 2007 (Reijneveld, Spijker, & Dijkshoorn, 2007). The Greek version of Katz ADL was also demonstrated to be valid and reliable in cancer patients (Mystakidou et al., 2013). There are other studies concentrating on cross-cultural validity in different ethnic groups (Alvarez Solar et al., 1992; Cabanero-Martinez, Cabrero-Garcia, Richart-Martinez, & Munoz-Mendoza, 2009; Cummings, Neff, & Husaini, 2003; Khoei, Akbari, Sharifi, Fakhrzadeh, & Larijani, 2013; Moss, Roubideaux, Jacobsen, Buchwald, & Manson, 2004; Raji, Al Snih, Ray, Patel, & Markides, 2004).

Culture is important in shaping our behavior, cultural norms and values influence our way of life, so influence our daily activities of living. There is a great need for cross-culturally validated and reliable scales to use both in clinical practice and in research. Such validation studies are necessary for researchers to provide adapted scales with more accurate interpretations when used in different cultures. The aim of this study is to assess the validity and reliability of the Turkish version of the Katz ADL in regards to other well-known health related scales such as BI and SF-36 PF.

2. Methods

2.1. Subjects, instruments and procedure

The study population included patients who were consecutively admitted to a geriatric medicine outpatient clinic between June 2014 and October 2014. A total of 211 patients aged 65 years and older underwent comprehensive geriatric assessment. The Katz ADL, the Folstein mini-mental state examination (MMSE) test (Gungen, Ertan, Eker, Yasar, & Engin, 2002), the Yesavage geriatric depression scale (GDS) (Burke, Roccaforte, & Wengel, 1991), the mini-nutritional assessment short form (MNA-sf)(Guigoz, Vellas, & Garry, 1996), the Lawton–Brody IADLs (Lawton & Brody, 1969), the Barthel index and SF-36 physical functioning subscale were administered to the patients by interviewing both the patients and the primary caregivers who were taking care of the patient for at least 20 hours per week and able to give reliable information about the patient. The Katz ADL measures six self-care tasks using a dichotomous rating (dependent-0/independent-1) in hierarchical order of decreasing difficulty as listed: bathing, dressing, toileting, transferring to and from a chair, maintaining continence and feeding. Six point is considered as independent and 0 point is considered as fully dependent. The Barthel Index measures ten self-care tasks including; bathing, dressing, feeding, personal hygiene, using toilet, bladder and bowel control, walking on the level surface, transfer from chair to bed, and using stairs and scored based on the amount of physical assistance required to perform these tasks, giving a total score ranging from 0 (fully dependent) to 100 (fully independent). The SF-36 physical functioning subscale (SF-36 PF) includes ten items: (1) vigorous activities (such as running, lifting heavy objects, participating in strenuous sports), (2) moderate activities(such as moving a table, pushing a vacuum cleaner, participating in moderate physical activities), (3) lifting or carrying groceries, (4) climbing several flights of stairs, (5) climbing one flight of stairs, (6) bending, kneeling, or stooping, (7) walking more than a mile, (8) walking several blocks, (9) walking one block, (10) bathing or dressing yourself. The question of 'Does your health now limit you in these activities? If so, how much?' is asked to the participants with three level of answers; yes limited a lot (0 point), yes limited a little (5 points) and no not limited (10 points) giving a total score ranging from 0 to 100; the higher the score, the better the physical performance.

A self-reported health status question with five level of response (excellent, very good, good, fair and poor) was also included. Patients were evaluated by physical and neurological examination; routine laboratory tests, demographic data including age, gender, marital status, living arrangement, and education level were obtained from medical records. The diagnosis of dementia and delirium was made according to Diagnostic and Statistical Manual of Mental Disorders IV criteria. Comorbidies were assessed as being diagnosed for hypertension, diabetes, coronary heart disease, cerebrovascular disease, chronic respiratory disease, chronic kidney disease, malignancy, depression, osteoarthritis, and rhematologic diseases according to the statement of patients and ICD-10 codes. We separated our sample into two age groups as 65–74 years old and $\geq$75 years old. We compaired patient characteristics, comorbidities, distribution of scores of BADLs, IADLs and other tests used for comprehensive geriatric assesment, according to age groups. The sampling included patients with severe dementia in order to analize known groups validity. However, the stage of dementia (global detoriation scale) was not included in the statistical analysis. Patients with acute illnesses, acute infections, or delirium were excluded from the study.

The translation of the Katz ADL was performed by two independent translators using the methodology of forward and backward translation. The final translation was reviewed and compared by clinicians to assume both item and semantic equivalence. The translation was tested on a small group of patients regarding the understanding of the concept. The final translated scale was administered by two independent geriatricians at the same day at different rooms to all 211 participants to test the interrater reliability. One of these investigators also applied the tool again to 36 participants and the same caregivers in one week period for test-retest analysis. In order to test reliability of the Turkish version of Katz ADL; internal consistency and test-retest reliability analysis were performed. For testing the construct validity the Katz ADL was administered concurrently with BI and SF-36 PF. Spearman rank correlations were assessed between the Katz ADL and health outcomes such as number of comorbidities