



Reliability and Validity of the Turkish Version of the Oxford Participation and Activities Questionnaire in Older People

Merve Karapinar¹, Ferdi Baskurt¹, Zeliha Baskurt¹, Ayla Gunal², Muhammet Cem Kockar³

¹Department of Physiotherapy and Rehabilitation, Faculty of Health Sciences, Suleyman Demirel University, Isparta, Turkey

²Department of Physiotherapy and Rehabilitation, Faculty of Health Sciences, Tokat Gaziosmanpasa University, Tokat, Turkey

³Department of Internal Medicine, Medical Faculty, Suleyman Demirel University, Isparta, Turkey

Corresponding Author:

Merve Karapinar, MSc

Department of Physiotherapy and Rehabilitation, Faculty of Health Sciences, Suleyman Demirel University, Isparta 3200, Turkey

E-mail: mervekarapinar1306@gmail.com

ORCID:

<https://orcid.org/0000-0003-2751-5744>

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Background: Activities and participation play important roles in the maintenance of healthy aging. The maintenance of these factors optimizes social life to increase the quality of life with aging. However, there is a lack of questionnaires in Turkish to evaluate activity and participation among older people. This study translated and cross-culturally adapted the Oxford Participation and Activities Questionnaire (Ox-PAQ) into Turkish and investigated its psychometric properties in the older adult population. **Methods:** The Turkish version of the Ox-PAQ was produced after a translation and back-translation process. The Ox-PAQ was administered to 230 and 60 individuals for construct validity and reliability analyses, respectively. To assess the test-retest reliability of the Turkish Ox-PAQ, the questionnaire was reapplied 7 days after the first interview. Cronbach's alpha (α) was used to evaluate the internal consistency. The Ox-PAQ was compared to the Short Form-12 and the Katz Index of Independence in Activities of Daily Living Scale to determine its validity. **Results:** The Turkish Ox-PAQ showed excellent internal consistency ($\alpha=0.98$) and test-retest reliability (intraclass correlation coefficient=0.98, 0.96, and 0.97 for the subscales of routine activity level, social engagement, and emotional well-being, respectively). In the validity analysis, factor analysis demonstrated a probable structure of the three factors that together explained 66.35% of the total variance. The Turkish Ox-PAQ was correlated with the other comparison measures used in this study. **Conclusion:** The Turkish Ox-PAQ is a reliable and valid questionnaire to evaluate the participation and activity levels of older people (Clinical Trial Number: NCT04368754).

Key Words: Aged, Community participation, Health, Physical activity, Surveys and Questionnaires

INTRODUCTION

Aging can be defined as a period in which biopsychological changes occur, with an increment in specific problems and decrement in physical activity and functional cognitive status. The United Nations reported 703 million people aged 65 years or older worldwide in 2019, which accounted for 10% of the world population. In Turkey, the aged population increased to 7.55 million in 2019 from 6.65 million in 2014. The aged population increases more than other age groups, and it has increased by 21.9% over the past

5 years according to statistics released by the Turkish Statistical Institute. The older population comprised 9.1% of the total population in 2019, which increased from 8.0%.¹⁾ The rapid increase in the older population leads to social, economic, health, and political changes. Therefore, studies on aging are of increasing importance.

Studies conducted in Turkey have shown that chronic illnesses, cognitive impairments, and environmental barriers (transportation, etc.) increase the dependency of older people in activities of daily living and force them to engage in more passive activities. However, the living environments of older individuals also affect

their activity and participation level,²⁾ with community-dwelling older adults more independent and more social in their daily life activities compared to those living in nursing homes.³⁾ In this context, it is possible to allow older individuals to participate in daily life activities by providing social support networks and planning support mechanisms.⁴⁾ Thus, there is an increased need for studies on aging in Turkey and to evaluate the current situation of older people based on standard valid and reliable measurement methods.

Protecting the health of older people is a major challenge for public health services. The increase in the geriatric population both worldwide and in Turkey indicates the need for health services and health policies to promote healthy aging by changing from a “curative” to a “preventive” paradigm.⁵⁾ Prevention approaches have been developed to prevent chronic disease and support successful aging. The preventive approaches in healthy aging models include lifestyle and behavioral changes, health protection, and slowing or stopping the progression of chronic diseases.⁶⁾

Activity and participation play important roles in the maintenance of general health. Participation in physical activities or social life allows older people to maintain their quality of life, better physical function, and functional health.⁷⁾ The assessment of health and well-being in terms of activities and participation among older people is important for determining their disability status, monitoring therapy, predicting outcome and protective and preventive health approaches, and evaluating risk behaviors.⁸⁾ Validated assessment methods can be used to evaluate the activity and participation levels of older people. However, the existing assessment methods focus on treatment and rehabilitation approaches, and no Turkish scale is available to assess activity or participation.

The validated Oxford Participation and Activities Questionnaire (Ox-PAQ) is theoretically based on the World Health Organization International Classification of Functioning, Disability and Health (ICF). The Ox-PAQ assessment tool allows the comprehensive evaluation of health and well-being in terms of activities and participation.⁹⁾ As there is a lack of questionnaires in Turkish to evaluate activity and participation of older people, the objective of this study was to determine a valid and reliable questionnaire for clinicians to assess these factors among older people in the Turkish population.

MATERIALS AND METHODS

Permission to develop the Turkish cross-cultural translation was obtained from the Health Services Research Unit, part of the Nuffield Department of Population Health at the University of Oxford. The Ox-PAQ was translated in five stages, as recommended by

Oxford University Clinical Outcome Services.¹⁰⁾ The first stage was forward translation performed independently by two native Turkish translators. One translation was performed by a physical therapist to ensure consistency from a clinical viewpoint. The second translation was made by another person with no medical or clinical background to reveal any ambiguous concepts in the original survey. These provided the literal and conceptual translations of the Ox-PAQ. Both translators spoke English fluently as their mother tongue. The translations were completed independently. In the second stage, two translators and other researchers reviewed and compared the translations to create the first Turkish translation of Ox-PAQ by evaluating for any conceptual errors or inconsistencies in the translations. The third stage was backward translation. After the first Turkish translation was developed, it was translated back into English separately by two translators who knew Turkish well and whose mother tongue was English. Both interpreters were unaware of the object of this study. In the fourth stage, the back-translated version of the Ox-PAQ was compared against the original English version of the Ox-PAQ by four translators. They assessed the translations and compared inconsistencies. After discussing the inconsistencies, the committee finalized and approved the Turkish version of the Ox-PAQ. Finally, preliminary tests were conducted to determine the understanding of the Turkish version of the questionnaire. A pilot study was conducted of 20 older volunteers—12 (60%) females; mean age 66 ± 4.52 years; range, 65–75 years; body mass index (BMI) 26.42 ± 8.34 kg/m². After each participant had completed the assessment, they were interviewed by physiotherapists (MK and FB) to determine whether they had difficulty understanding the questions. The interviews required approximately 15 minutes per patient to complete. The questions that were difficult to understand were recorded, and revision recommendations were requested from the patients. During the preliminary testing, the participants showed a lack of understanding of the first question, which is “Getting up in the morning?” due to confusion regarding waking up or getting up from the bed in the morning.

The cross-sectional study was conducted at an outpatient clinic at the Department of Internal Medicine at Suleyman Demirel University Hospital in Isparta, Turkey. The participants were recruited from January 2018 to June 2019.

Participants were enrolled if they agreed to participate and if they were aged 65 years or older, had a Mini-Mental State Examination (MMSE) score < 24, and could mobilize independently. The exclusion criteria were severe vision and hearing loss; orthopedic, vestibular, neurological, or mental problems such as upper and lower extremity pathology that could prevent or restrict the implementation of the test protocol; failure to cooperate; and pres-

ence of an acute disease.

This study was approved by the Ethical Committee of Clinical Research of Suleyman Demirel University, Faculty of Medicine on December 13, 2018 (No. 191). Each participant was informed about the content of the study, and the volunteers read and signed informed consent forms. The volunteers needed to express that they would like to participate in the study. A total of 230 consecutive participants were asked to complete the Turkish version of the Ox-PAQ (Supplementary Table S1), as well as the MMSE, the Katz Index of Independence in Activities of Daily Living Scale (Katz ADL), the Short Form-12 (SF-12), and Five Times Sit-to-Stand tests.

The reliability of the Ox-PAQ scores was estimated using the test-retest and internal consistency methods. To determine the test-retest reliability, 60 individuals were asked to complete the scale 7 days after the first assessment.

In reliability analysis, the standard advice is to have at least 10 participants per item on the scale.¹¹⁾ Since the scale tested in this study comprised 23 items, this study included 230 individuals.

Ox-PAQ

This tool contained 23 items, each measured on a 5-point Likert scale. Each of the 23 items is scored similarly (0 = never, 1 = rarely, 2 = sometimes, 3 = often, 4 = always). The Ox-PAQ comprise three domains, namely routine activities (14 items: #1, #2, #3, #4, #5, #6, #7, #8, #9, #10, #13, #14, #16, #17), social engagement (4 items: #11, #12, #15, #18), and emotional well-being (5 items: #19, #20, #21, #22, #23). The raw scores of the Ox-PAQ are transformed to a range from 0 to 100. The formula for scoring each dimension is as follows: the sum of scores for each question in dimension/((4 × number of the questions in the dimension) × 100).¹²⁾ Higher scores indicated greater problems with activity and participation.

MMSE

This scale is used to screen for cognitive impairment in geriatric populations. MMSE scores ≥ 24 are considered to indicate normal cognitive function.¹³⁾

Katz ADL

This assessment tool evaluates basic functional areas such as dressing, transferring, and continence. Activities performed with help and independently are assigned 0 and 1 point, respectively. The Turkish version of this scale has been proven to be reliable and valid for older adults by Arik et al.¹⁴⁾ The Katz ADL index correlates well with measurements of home confinement, mobility, and participation in older people.¹⁵⁾

SF-12

The SF-12 is one of the most widely used instruments to assess self-reported health-related quality of life. This scale consists of 12 items to reproduce the physical component scale and mental component scale from the SF-36 Health Questionnaire.¹⁶⁾ The SF-12 and Katz ADL tests are examination tool used to define activity and participation and have been applied in older adult populations.¹⁷⁾

Statistical Analysis

All statistical analyses were conducted using IBM SPSS Statistics version 20.0 for Windows (IBM Corp., Armonk, NY, USA). Kolmogorov–Smirnov and Shapiro–Wilk tests were used to determine if variables were normally distributed. Categorical variables are presented as numbers and percentages and continuous variables as means and standard deviations if normally distributed and as medians and interquartile ranges if not normally distributed. Mann–Whitney U tests were used for comparisons of independent groups. p-values < 0.05 were considered statistically significant.

The internal consistency was evaluated using Cronbach's alpha coefficient, with alpha values of 0.70–0.80, 0.80–0.90, and > 0.90 indicating satisfactory, good, and excellent consistency, respectively. Intraclass correlation coefficient (ICC) values with 95% confidence intervals (CIs) were used to estimate the test-retest reliability of the Ox-PAQ subgroup and total form, with ICC of 0.60–0.80 and > 0.80 indicating good and excellent correlations, respectively.¹⁸⁾ Student paired t-tests were used to detect statistically significant differences between the first and second tests.

The Kaiser–Mayer–Olkin (KMO) test and Bartlett criterion were used to test the suitability of the variables in the factor analysis. The construct validity of the Ox-PAQ was analyzed using principal component analysis (PCA) with varimax rotation.¹⁹⁾

The criterion validity was assessed by examining the correlations between the Ox-PAQ and other parameters using Pearson correlation analysis, with correlation values of ≥ 0.40 considered satisfactory (Pearson correlation coefficient, r: 0.81–1.0 “excellent”, 0.61–0.80 “very good”, 0.41–0.60 “good”, 0.21–0.40 “fair”, and 0.00–0.20 “poor correlation”).²⁰⁾

The content validity was assessed by determining the distribution of the scales and the occurrence of ceiling and floor effects. Floor and ceiling effects were defined as 15% or more of the participants with the lowest and highest possible scores on the Ox-PAQ, respectively.²¹⁾

RESULTS

A total of 230 participants were evaluated. The mean age was 71.0 ± 6.25 years, and 63.5% of the participants were female. Their characteristics and comorbidities are shown in Table 1. The Turkish Ox-PAQ/routine activities and Ox-PAQ/social engagement scores were higher in individuals older than 70 years ($p < 0.001$) (Table 2).

During the preliminary testing the participants showed a lack of understanding of the first question which was “Getting up in the morning”. For this reason, “Getting up in the morning” translated

Table 1. Participant characteristics (n=230)

Characteristic	Value
Sex	
Female	146 (63.5)
Male	84 (36.5)
Age (y)	71.0 ± 6.25
Weight (kg)	75.8 ± 11.8
Height (cm)	163.1 ± 7.90
BMI (kg/m^2)	28.6 ± 4.50
MMSE	27.9 ± 1.53
Level of education (y)	
≤ 8	150 (65.21)
> 8	80 (34.79)
Marital status	
Married	174 (75.65)
Widowed	56 (24.35)
Charlson Comorbidity Index	0 (0–3)
Diagnosis/comorbidities	
Cardiac disease	78 (33.9)
Respiratory	40 (17.3)
Gastrointestinal	23 (10)
Endocrine	96 (41.7)
Other	64 (27.8)

Values are presented as number (%) or mean±standard deviation or median (min–max).

BMI, body mass index; MMSE, Mini-Mental State Examination.

Table 2. Comparisons of Ox-PAQ subgroup scores

	Ox-PAQ/ routine activities	p-value	Ox-PAQ/social engagement	p-value	Ox-PAQ/emotional well-being	p-value
Age (y)						
> 70 (n = 134)	22.2 ± 17.7	0.001*	34.4 ± 20.6	0.001*	16.3 ± 14.6	0.009*
≤ 70 (n = 96)	33.3 ± 21.5		40.3 ± 26.8		23.2 ± 18.7	
Gender						
Female (n = 146)	26.6 ± 19.0	0.815	36.7 ± 24.2	0.960	19.3 ± 14.1	0.514
Male (n = 84)	26.0 ± 19.5		36.5 ± 27.0		17.6 ± 15.8	

Values are presented as mean±standard deviation.

Ox-PAQ, Oxford Participation and Activities Questionnaire.

* $p < 0.05$.

to “Waking up in the morning”.

Cronbach’s alpha coefficient used to calculate the internal consistency was 0.98, thus demonstrating good internal consistency for the Turkish version of the Ox-PAQ and supporting the reliability. Sixty patients were interviewed two times in a 1-week period. The ICC value for the inter-rater reliability was 0.99 (95% CI, 0.97–0.99) (Table 3).

Our data were suitable for KMO factor analysis. The KMO coefficient was 0.885 and Bartlett test showed a significant result ($\chi^2 = 4164.897$, $df = 253$, $p < 0.001$). PCA to determine whether the Ox-PAQ had a three-factor structure showed that the three-factor structure represented 66.35% of the total variance. The eigenvalues were 10.30, 2.70, and 1.62 for factors 1, 2, and 3, respectively. PCA confirmed that the 23 items loaded onto three factors. The factor loadings ranged from 0.889 to 0.465 (Table 4), all of which were > 0.30 .

The criterion validity was assessed by the association between the Ox-PAQ and SF-12 and Katz ADL. As shown in Table 5, the correlation with the SF-12 PF was very good ($r = -0.642$, $p < 0.001$) while that for the Katz ADL was fair ($r = 0.358$, $p = 0.005$). No floor or ceiling effects were identified for the whole scale. The numbers of items with responses were identical between the test and retest examinations.

Table 3. Test-retest reliability of the Turkish version of the Ox-PAQ and its subgroups (n=60)

	ICC (95% CI)	Cronbach’s α
Routine activities	0.98 (0.97–0.99)	0.99
Social engagement	0.96 (0.91–0.97)	0.97
Emotional well-being	0.97 (0.94–0.98)	0.98
Total Ox-PAQ	0.98 (0.97–0.99)	0.98

Ox-PAQ, Oxford Participation and Activities Questionnaire; ICC, intraclass correlation coefficient; CI, confidence interval.

Table 4. Factor loading and percentages of explained and cumulative variance for the Ox-PAQ

Domain	Factor loading	Explained variance (%)	Cumulative variance (%)
Routine activities		44.8	44.8
Q13. Engaging in community life	0.884		
Q2. Getting dressed	0.860		
Q8. Physical activities for enjoyment	0.857		
Q9. Leisure activities	0.753		
Q3. Getting around home	0.725		
Q14. Being as independent as would like	0.718		
Q1. Getting up in the morning	0.701		
Q6. Daily activities you like to do	0.690		
Q10. Physical activities for enjoyment	0.649		
Q4. Doing household chores	0.604		
Q5. Going to shops	0.547		
Q17. Using public transport	0.524		
Q16. Using own transport	0.465		
Q7. Doing work, paid or unpaid	0.461		
Emotional well-being		11.8	56.5
Q19. Anxious control over life	0.882		
Q22. Sad	0.866		
Q21. Anxious	0.843		
Q20. Stressed	0.753		
Q23. Depressed	0.643		
Social engagement		24.1	63.6
Q12. Maintaining friendships	0.889		
Q11. Maintaining close relationships	0.784		
Q18. Communicating with others	0.716		
Q15. Engaging in the community	0.597		

Ox-PAQ, Oxford Participation and Activities Questionnaire.

Table 5. Pearson rank correlations between Turkish Ox-PAQ and other indices

	Ox-PAQ/routine activities		Ox-PAQ/emotional well-being		Ox-PAQ/social engagement		Ox-PAQ Total	
	r	p-value	r	p-value	r	p-value	r	p-value
Katz ADL	0.368	0.005	0.388	0.005	0.342	0.005	0.358	0.005
FTSS	0.523	0.000*	0.692	0.001*	0.644	0.001*	0.632	0.001*
SF-12 PCS	-0.681	0.000*	-0.619	0.001	-0.564	0.001*	-0.642	0.001*

Ox-PAQ, Oxford Participation and Activities Questionnaire; ADL, Activity of Daily Living, FTSS, Five Times Sit to Stand, SF-12 PCS, Short Form-12 Physical Score; r, Pearson correlation coefficients.

*p<0.05.

DISCUSSION

The results of this study showed the reliability and validity of the Turkish version of the Ox-PAQ in measuring the proportion of activity and participation among Turkish older people. The Ox-PAQ scores were significantly related to other measures of activity and physical function. The results of the study demonstrated measurement qualities of the Turkish version of the Ox-PAQ, which makes it a reliable and valid scale for fields of research and practice related

to geriatric medicine and rehabilitation.

The Ox-PAQ has now been validated in a wide range of conditions including chronic obstructive pulmonary disease, multiple sclerosis and Parkinson's disease.¹²⁾ We have demonstrated that the Ox-PAQ is a useful tool for the assessment of activity and participation in older adults with respiratory, gastrointestinal, or endocrine problems. Our results suggest that the questionnaire is applicable in different populations.

Studies on activity and participation have gained importance in

our country. Pekcetin et al.²¹⁾ showed occupational competence and values in older Turkish individuals. Similarly, Akyurek et al.²²⁾ emphasized the importance of community participation among people with disabilities. The results of our study showed the validity and reliability of a questionnaire that covers the activities and participation in routine activities, as well as the emotional well-being and social engagement among older people in our country.

Morley et al.⁹⁾ reported high internal reliabilities for the three domains of the original Ox-PAQ (Cronbach's alpha, 0.81–0.96). The internal reliabilities of these three domains were also high in our study (Cronbach's alpha, 0.97–0.99). These results are similar to those of Morley et al.⁹⁾ These values were also emphasized in a study assessing health status and quality of life instruments, indicating their good-to-excellent internal reliability.²³⁾ The ICCs of the three Ox-PAQ domains in the first study ranged between 0.83 and 0.92,⁷⁾ compared to 0.95–0.98 in the current study, indicating excellent external reliability.²⁴⁾

Other studies validating Ox-PAQ in other languages performed retests after 14 days.¹²⁾ In our study, the retest was performed after 1 week. In older people who are vulnerable to sudden changes in general health status due to acute problems, 2 weeks was considered too long; thus, the retest was performed after 7 days.

The criterion validity of Ox-PAQ was demonstrated by evaluating the validity of the simultaneous and other activity indices. The correlation analyses showed significant associations between Ox-PAQ and the SF-12 and Katz ADL, consistent with the literature.⁹⁾ However, only a fair correlation was observed between the Ox-PAQ and Katz ADL.

This weak relationship may be due to the lack of an item on emotional well-being and social participation in the Katz ADL and that the scale questions basic daily living activities with six items. The Turkish Ox-PAQ comprises three factors, similar to the original version. These results showed that the Turkish Ox-PAQ can be used to evaluate activity and participation among older people.

The hesitation regarding only one item in the Ox-PAQ translation stage showed that it can be used in different societies independent of culture. When collecting data from the Ox-PAQ, almost none of the female respondents answered the 16th question: using their own means of transport. One explanation for this is not that there is no difficulty in driving but rather that women lack the necessary qualifications such as a driving license. Furthermore, the number of female drivers is not as high as male drivers in Turkey. While the ratio of female drivers was 14% in 2001, it reached 20% by the end of 2011.²⁵⁾

Consistent with previous studies, we observed higher routine activity, emotional well-being, and social engagement scores in the younger age group (aged 65–69 years) than in the older age group

(aged ≥ 70 years). Dodge et al.²⁶⁾ reported a higher level of participation in social activities in older adults aged 65–74 years than in adults aged 85 years and over. Contrary to previous studies, we found no difference in Ox-PAQ subgroups between older male and female individuals. Other studies reported higher participation levels in leisure activities among men than among women. The differences in the patterns of physical activity and social participation between women and men have been attributed to the type of questionnaire used by men.²⁷⁾ In our study, we observed no difference in physical activity and participation between the genders, which may indicate that the contents of the Ox-PAQ are suitable for both genders.

Our study has several limitations. While Sampaio et al.²⁸⁾ reported that time interval in test-retest reliability for geriatric population varied between 5 and 7 days, a systemic review that analyzed the test-retest reliability in patient-reported outcome measures for older populations suggested a time interval of 14 days.²⁹⁾ Our study sample of community-dwelling older adults considered a time interval of 7 days, which may be short. Thus, this time interval is one limitation of the current study. The other limitation is that all participants were living within community dwellings and might not represent all community-dwelling older people. In our society, older people residing in living environments including nursing homes, rehabilitation centers, etc., should be considered in terms of developing a database pertaining to older people, especially those with disabilities in society, based on the results of this study. Finally, we could not objectively evaluate physical activity level as part of the validation assessment tool. Future studies are needed to address this limitation and determine the participation levels of older adults. The strength of the present study was its relatively large sample size, which was sufficient for factor analyses to determine the underlying factors that represent the Ox-PAQ construct and eliminate items.

In conclusion, the results of our study demonstrated the validity and reliability of the Ox-PAQ, which is theoretically based on the ICF of the World Health Organization and fully compliant with the current best practice guidelines. Moreover, its easy application in a short time suggests the practical application of the questionnaire for evaluations. Additional studies on the validation and reliability of the Ox-PAQ in other languages will provide information about older adults' participation levels in different contexts and increase policymaker and health researcher understanding. The results of these studies will allow appropriate policy and health interventions to be planned. The present Turkish version of this activity and participation tool can be used to assess the activity and participation levels of community-dwelling older people. While several language versions of the Ox-PAQ are described in the Oxford Uni-

versity library (<https://innovation.ox.ac.uk/outcome-measures/oxford-participation-activities-questionnaire-ox-paq>), to the best of our knowledge, no studies have assessed their validity and reliability in specific populations. Therefore, more studies on specific populations are warranted.

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CONFLICT OF INTEREST

The researchers claim no conflicts of interest.

AUTHOR CONTRIBUTIONS

Conceptualization, MK, ZB; Data curation, MK, MCK; Formal Analysis, AG; Investigation, FB, MK; Methodology, MK, ZB; Supervision, FB; Validation; AG; Writing – original draft, MK, AG; Writing – review & editing, ZB, FB, MCK.

SUPPLEMENTARY MATERIALS

Supplementary materials can be found via <http://doi.org/10.4235/agmr.20.0074>

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