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Original Article

# The Persian Version of the Nottingham Leisure Questionnaire: Translation, Cultural Adaptation, and Psychometric Properties

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ABSTRACT

**Background:** Leisure as an occupation plays an important role in people's daily lives. This study aimed to translate and culturally adapt the original Nottingham Leisure Questionnaire to Persian and assess the psychometric properties of the Persian version.

**Methods:** One hundred and forty healthy individuals participated in this cross-sectional study. Face and content validity were assessed by determining the impact score of the item, content validity ratio, and content validity index methods. Convergent validity was assessed using the correlation method between the Nottingham Leisure Questionnaire and the Occupational Balance Questionnaire-11, Meaningful Activity Participation Assessment, 36-item short-form health survey, and Satisfaction with Life Scale. The reliability of the Persian version of the Nottingham Leisure Questionnaire was assessed by internal consistency and test-retest reliability. Data analysis was conducted using SPSS. v. 23.0 software at a significance level of 0.05.

**Results:** Face and content validity demonstrated an acceptable range (impact score: 2.2 to 4, content validity ratio: 0.57 to 1, and content validity index: 0.87 to 1). Significant correlations between assessment tools supported Convergent Validity. There was moderate internal consistency (α=0.77) and excellent test-retest reliability for the number of leisure scores (interclass correlation coefficient [ICC]=0.894) and frequency of leisure participation scores (ICC=0.883).

**Conclusion:** The Persian version of the Nottingham Leisure Questionnaire is a psychometrically valid, reliable, and useful instrument to assess leisure in healthy Persian-speaking participants.



## Introduction

Leisure is one of life's most significant aspects as it promotes health and well-being. It is defined as an occupation as follows: "Nonobligatory activity that is intrinsically motivated and engaged in during discretionary time, that is, time not committed to obligatory occupations such as work, self-care, or sleep"[1, 2]. Studies on mental health have revealed the importance of recreational activities in the management and prevention of mental diseases such as schizophrenia, anxiety, depression, and stress [3-6]. Leisure activities have been shown to protect against the onset of dementia and cognitive decline [7], as well as age-related physical decline, including chronic pain and disability [8, 9]. They also improve self-reported physical health [10].

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Given leisure's impact on several facets of life, occupational therapists should view leisure as a unique and significant area of evaluation and intervention. Therefore, a method and tool to accurately evaluate leisure are required.

Leisure evaluation is conducted both informally through interviews and formally through standard assessments [11]. Despite the valuable information provided by leisure assessment tools, it is important to remember that leisure participation is a multidimensional concept influenced by culture [12]. When leisure assessments are created in one nation, they may be culturally competent for those living in that specific setting. However, people from other nations may not find these assessments appropriate due to differences in procedures or wording for certain items. For instance, researchers who reviewed the British version of the Activity Card Sort (ACS) had to modify some images and terms related to activities and add or remove activities to make them culturally appropriate for people living in the UK [13]. Additionally, these tools must be updated regularly because people's lifestyles and leisure participation habits constantly evolve.

One of the standardized assessment tools for leisure evaluation is the Nottingham Leisure Questionnaire (NLQ). This questionnaire was initially developed for individuals with stroke and includes 30 predetermined items and two self-report items, examining leisure occupations in terms of the number and amount of participation. The scoring method for the 30-item questionnaire is as follows: 0=never, 1=occasionally' and 2=regularly. The total score can range from 0 to 60, with higher scores indicating greater involvement in leisure occupations. Only researcher-made tools have been used in Persian language research, most of which require further investigation and updating. Additionally, it is necessary to use a common measurement tool that can apply to people with different characteristics and cultural backgrounds. Therefore, this study aims to translate the Nottingham Leisure Questionnaire (NLQ-P) into Persian and examine its psychometric qualities in healthy Persian speakers.

## Methods

*Research Method*

This study investigates the validity and reliability of the Persian version of the Nottingham Leisure Questionnaire through a psychometric and descriptive approach.

*Participants*

One hundred fourteen healthy individuals aged 18 and 55 participated in this cross-sectional study. The convenience sampling method was utilized to recruit the participants. The inclusion criteria for participants were:

1) Mastery of the Persian language (speaking in Persian)

2) A cognitive level of 23 based on the Mini-Mental State Examination [14]

3) No previous diagnosis based on the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), according to interviews and medical records

4) Absence of any neurological disorder (central nervous system disorders, head injury with loss of consciousness, or seizure disorders) according to interviews and medical records.

5) Absence of intellectual problems or learning disorders, chronic diseases, and routine use of psychiatric drugs, as determined by interviews and medical records.

After the research commenced, participants who could not cooperate for any reason (illness, travel, or change of residence) or did not wish to continue were excluded from the study.

*Procedure*

Initially, the translation procedure followed the International Quality of Life Assessment (IQOLA) standard methodology after obtaining permission from Professor Avril Drummond to translate the NLQ [15]. Two translators, whose mother tongue was Persian and unfamiliar with the NLQ, independently translated the original questionnaire into Persian (forward translation). In a subsequent meeting with the researchers and translators, they agreed on the final Persian version. In the next step, the Persian version was translated back into English by two native English translators who were experienced in translating from Persian to English (backward translation). The resulting English version was compared with the original questionnaire for conceptual similarity, and discussions were held in two meetings with the translators and researchers to confirm its consistency.

The sampling process began after preparing the final version of the translation and obtaining approval from the developer. Every participant received information regarding the objectives and potential issues related to the research procedure, as well as an assurance that their involvement in the study was entirely voluntary and that they could discontinue participation at any time. After obtaining signed consent forms, study evaluations were conducted. All assessments were done in random order, individually, under the supervision of an occupational therapist in one session lasting about 60 minutes (including 15-minute breaks). To investigate test-retest reliability, fifty-five participants took the NLQ-P twice at two weeks (this interval was chosen to reduce the effect of memory on answering the items). The Iran University of Medical Sciences ethics committee approved the entire research process (IR.IUMS.REC.1401.623).

*Instruments*

**Nottingham Leisure Questionnaire (NLQ):** The NLQ assesses the leisure activities in which an individual participates. This scale contains 30 items and an "other" category that allows the individual to add two additional leisure activities not listed in the NLQ. The items are rated on a 3-point Likert scale: 0 (never), 1 (sometimes), and 2 (regularly), which collectively indicate the number and frequency of participation in leisure activities. Test-retest reliability based on items indicated acceptable reliability (Kappa=0.44 to 0.94) [16] and the internal consistency of the French version has been reported as α=0.76 [17]. In this research, we considered two final scores for the NLQ-P: NLQ-P-N indicates the number of leisure activities the person participated in, and NLQ-P-F

indicates the frequency of the person's leisure activities.

**Occupational Balance Questionnaire-11 (OBQ-11):** This questionnaire assesses occupational balance, which is defined as having the right number of occupations while maintaining enough diversity in occupational patterns. The questionnaire consists of 11 questions, each scored between 0 and 3, with a total possible score ranging from 0 to 33. A higher score indicates a better occupational balance. This tool's reliability score (Cronbach's alpha) is 0.92 [18].

**Meaningful Activity Participation Assessment (MAPA):** The MAPA is a self-report tool that evaluates participation in 28 everyday activities based on frequency and meaning. A higher score denotes greater participation in meaningful activities. The total MAPA score ranges from 0 to 672 [19]. Results indicate that the MAPA has strong test-retest reliability (ICC=0.92) and reasonable internal consistency (Cronbach's α=0.79) [20].

**36-Item Short-Form Health Survey (SF-36):** This survey comprises eight subscales, divided into two primary sections: physical and mental. The overall score can range from 0 to 100, with a higher score signifying a higher quality of life. The reliability coefficient of this questionnaire has been reported to range from 0.77 to 0.95 [21].

**Satisfaction with Life Scale (SWLS)**: The SWLS is a five-item survey that assesses general life satisfaction. A higher score denotes greater life satisfaction. Each item is rated on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree), with a total score ranging from 5 to 35. The SWLS has high test-retest reliability and internal consistency [22].

*Statistical Analysis*

Twenty participants were asked to score each item's relevance on a five-point Likert scale (totally important, important, moderately important, slightly important, not significant at all) after reading it to assess the questionnaire's face validity. An item is considered appropriate for additional analysis if its effect score exceeds 1.5 [23]. Two methods were employed to evaluate content validity: the content validity index (CVI) and the content validity ratio (CVR). For each of the 32 elements in the NLQ-P, 15 PhD occupational therapists were asked to select "necessary," "not necessary but useful," or "not necessary" to calculate CVR. Scores greater than 0.49 were acceptable after reviewing the responses in light of Lawshe's research [24]. The Waltz and Bausell reliability approach was used to check CVI after calculating and finding CVR [25]. To achieve this, the experts were provided with the CVI questionnaire. They were instructed to rate each of the 32 items on a four-point Likert scale, considering the three criteria of "relevance," "simplicity," and "clarity." The content validity index in this study was computed using the CVI formula, and items were accepted if their CVI score was greater than 0.79 [26].

The association between NLQ-P and SF-36, OBQ, SWLS, and MAPA was examined using Pearson and Spearman correlation coefficients to evaluate the convergent validity. Fifty-five participants took the NLQ-P twice, separated by two weeks, to assess the test-retest reliability. The intraclass correlation coefficient (ICC) with a 95% confidence interval was employed, and values higher than 0.7 were accepted as acceptable [27]. Cronbach's α was used to assess internal consistency, with values higher than 0.7 regarded as acceptable [28].

The percentage of participants who received the lowest and highest possible score on the NLQ-P was used to calculate the floor and ceiling effects; a result of less than 15% is considered acceptable. The Standard Error of Measurement (SEM) was computed to examine measurement accuracy in repeated assessments. The formula for SEM is $SD\times\sqrt{(1-ICC)}$. Minimal Detectable Change (MDC) is the smallest alteration in the score representing the actual functional change, as determined by $Z95\times\sqrt{2}\times SEM$. All statistical analyses were performed using SPSS.23. A significance level of 5% was considered in all statistical calculations.

## Results

*The Method of Cultural Adaptation and Translation*

Due to the cultural differences of the studied community, the following changes were made to the items of the questionnaire:

1) Item "visiting family/friends" changed to "spending time with family/friends".
2) Item "gardening" changed to "gardening/floriculture".
3) Item "indoor games/cards/bingo/dominoes" changed to "indoor games/ cards/ bingo/ dominoes/ board games".
4) Item "looking after/exercising pets" changed to "taking care of pets".
5) Item "going to pubs" changed to "going to cafe/ teahouse".
6) Item "going to plays/museums/cinema" changed to "going to recreational places/museums/cinema".
7) Item "church activities" changed to "religious/spiritual activities".
8) Item "DIY" changed to "performing simple skill activities".
9) Item "holidays" changed to "going on vocations".

The questionnaire was amended to add the items "playing video/multimedia games" and "internet-based activities, e.g., social media/web browsing" (from 30 to 32 items).

*Participants*

Evaluation tools were distributed to 171 individuals. Due to issues with providing information and completing the questionnaire, 27 participants were excluded. Ultimately, 144 individuals (79 men and 65 women) participated in the study. The demographic characteristics of the participants are detailed in Table 1, and the participant's performance in the assessments is summarized in Table 2.

*Validity*

*Face and Content Validity*

Quantitative face validity results revealed an impact score range of 1.67 to 3.91 for the items. Although occupational therapists suggested some items, no items were deleted or altered after the final review.

**Table 1:** Demographic characteristics of the study subjects

| | |
|---|---|
| Age (years) Mean±SD | 35.10±5.90 |
| Marital status | |
| Married N (%) | 77(53.5) |
| Single N (%) | 53(36.8) |
| Widowed/Divorced N (%) | 14(9.7) |
| Employment statues | |
| Jobless N (%) | 22(15.3) |
| Full-time job N (%) | 51(35.4) |
| Part-time job N (%) | 71(49.3) |
| Education level | |
| Sub-Diploma N (%) | 6(4.2) |
| Diploma N (%) | 40(27.8) |
| Academic N (%) | 98(68) |

The Content Validity Ratio (CVR) and Content Validity Index (CVI) were calculated for each questionnaire item for the quantitative content validity assessment. According to Lawshe's criteria, a CVR of at least 0.49 is acceptable. In this study, the CVR ranged from 0.60 to 0.86, indicating acceptable validity. The CVI scores ranged from 0.82 to 1.00, reflecting good content validity for the tool.

*Convergent Validity*

Correlation analysis of the NLQ-P scores with the SF-36, OBQ, SWLS, and MAPA tests is presented in Table 3. There was a high positive correlation between NLQ-P scores and those of the SF-36, OBQ, MAPA, and SWLS. All correlations were statistically significant at the 0.01 level (2-tailed).

*Internal Consistency and Test-retest Reliability*

The Persian version of the Nottingham Leisure Questionnaire (NLQ-P) demonstrated a moderate to high level of internal consistency with a Cronbach's α of 0.778. For test-retest reliability, the NLQ-P number of leisure score exhibited a high ICC of 0.894 (95% CI: 0.82–0.93), and the NLQ-P frequency of leisure participation score also showed high reliability with an ICC of 0.883 (95% CI: 0.80–0.93).

Item-to-total correlations for the NLQ-P number of leisure scores ranged from 0.06 to 0.584. The highest correlation was observed for item 7, "Crafts, e.g., knitting/sewing," while the lowest correlation was found for item 26, "Religious activities." For the NLQ-P frequency of leisure participation score, item-to-total correlations ranged from 0.376 to 0.691, with the highest correlation for item 15, "Indoor games/cards/bingo/dominoes/board games," and the lowest for item 22, "Exercise/fitness."

*Standard Error of Measurement (SEM), Minimal Detectable Change (MDC), Floor Effect, and Ceiling Effect*

The SEM values were calculated as 1.06 for the number of leisure scores and 1.81 for the frequency of leisure participation scores. The MDC values, which indicate the smallest score changes representing true changes in a person, were 2.84 for the number of leisure scores and 3.72 for the frequency of leisure participation scores. There were no floor or ceiling effects observed for either the number of leisure scores or the frequency of leisure participation scores.

## Discussion

The Persian version of the Nottingham Leisure Questionnaire (NLQ-P) demonstrates acceptable validity and reliability across several psychometric domains, including test-retest reliability, internal consistency, face validity, content validity, and convergent validity. The study used two key scores to evaluate the NLQ-P: the number of leisure activities (NLQ-P-N) and the frequency of leisure participation (NLQ-P-F).

Initially, both face validity and content validity were used to assess the validity of this scale. The impact scores for the items ranged from 1.67 to 3.91, indicating that the items were relevant and meaningful to the participants. The results confirm that the Persian version of the NLQ-P is understandable and pertinent for evaluating leisure activities among Persian speakers. The content validity analysis, including the Content Validity Ratio (CVR) and Content Validity Index (CVI), demonstrated that all items are necessary and appropriate for measuring leisure participation. The CVR scores ranged from 0.60 to 0.86, and the CVI scores were between 0.82 and 1.0, confirming the tool's relevance and clarity.

The findings of this study reveal a positive correlation

**Table 2:** Results of subject's performance on the assessment tools

| | Mean±SD | Minimum | Maximum |
|---|---|---|---|
| NLQ-P-N | 25.01±3.22 | 16 | 31 |
| NLQ-P-F | 29.73±5.35 | 20 | 45 |
| OBQ-11 | 21.61±5.04 | 9 | 30 |
| SWLS | 24.62±2.59 | 16 | 30 |
| MAPA | 319.08±51.23 | 211 | 456 |
| SF36 | 67.81±8.34 | 53 | 89 |

NLQ-P-N: Persian version of Nottingham Leisure Questionnaire number of leisure subscale; NLQ-P-N: Persian version of Nottingham Leisure Questionnaire frequency of leisure participation subscale; OBQ: Occupational Balance Questionnaire-11; SWLS: Satisfaction with Life Scale; MAPA: Meaningful Activity Participation Assessment; SF36: 36-Item Short-Form Health Survey

**Table 3:** Correlation between assessments and the Persian version of Nottingham Leisure Questionnaire )NLQ-P(

| | OBQ-11 | SWLS | MAPA | SF36 |
|---|---|---|---|---|
| NLQ-P-N | 0.477 | 0.525 | 0.576 | 0.514 |
| NLQ-P-F | 0.532 | 0.599 | 0.569 | 0.499 |

NLQ-P-N: Persian version of Nottingham Leisure Questionnaire number of leisure score; NLQ-P-N: Persian version of Nottingham Leisure Questionnaire frequency of leisure participation score; OBQ-11: Occupational Balance Questionnaire-11; SWLS: Satisfaction with Life Scale; MAPA: Meaningful Activity Participation Assessment; SF36: 36-Item Short-Form Health Survey

between leisure participation and, meaningful occupations and occupational balance. This aligns with existing research, which demonstrates that engaging in leisure activities can significantly enhance individuals' independence in daily life and improve their work-life balance and overall life satisfaction [29, 30].

Participation in leisure activities offers numerous benefits, including improved mental and physical health, increased enjoyment, enhanced self-concept and self-esteem, and the opportunity to forge and strengthen social connections. These benefits collectively contribute to a sense of purpose and fulfillment in daily life [31] Individuals can reflect on their performance in valued occupations by engaging in leisure activities and developing strategies to enhance their engagement.

Furthermore, our study found a significant association between the Nottingham Leisure Questionnaire (NLQ) scores and life satisfaction and quality of life. According to the World Health Organization, quality of life (QoL) is defined as individuals' perception of their position in life within their cultural and value systems and relative to their goals, expectations, standards, and concerns [32]. Leisure activities contribute to QoL by enhancing social satisfaction and overall well-being [33]. Numerous studies have shown that leisure participation has a substantial positive impact on subjective well-being and quality of life [34, 35] and improved life satisfaction [36]. Increased frequency of leisure activities is associated with higher quality of life and greater happiness [37]. Developing and promoting various leisure programs throughout life can, therefore, improve both quality of life and life satisfaction [38].

The internal consistency and test-retest reliability of the NLQ-P were assessed to gauge its reliability. The original NLQ has shown acceptable test-retest reliability with item analyses yielding Kappa values from 0.44 to 0.94 [16]. Similarly, our study found excellent test-retest reliability for the NLQ-P, aligning with previous research. The internal consistency of the NLQ-P was found to be moderate to good, indicating that the questions are consistently measuring the leisure construct. For comparison, the French version of the NLQ had an internal consistency of $\alpha$=0.76 [17]Importantly, no ceiling or floor effects were observed in the NLQ-P, highlighting its capability to accurately measure the full spectrum of leisure activities.

Despite these strengths, the study acknowledges several limitations that may affect the generalizability of the findings. The use of convenience sampling, while practical, may limit the extent to which the results can be generalized to the broader Persian-speaking population.

## Conclusion

The findings from this study underscore the convergent validity, satisfactory internal consistency, and robust test-retest reliability of the Persian version of the Nottingham Leisure Questionnaire (NLQ-P). The NLQ-P is a reliable self-report measure for assessing leisure activities among Persian-speaking individuals. This validation allows occupational therapists to integrate the NLQ-P into research and clinical practice with Persian populations, facilitating more nuanced assessments of leisure and its impact on well-being.

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**Conflict of Interest:** None declared.

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