# Psychometric Validation of the Urdu Version of the Jenkins Sleep Evaluation Questionnaire

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**Abstract**

**Background:** Jenkins sleep evaluation questionnaire (JSEQ) is an easy, self-reported instrument to assess sleeping disturbances. This cross-sectional, cross-cultural adaptation and validation study was aimed to translate and validate JSEQ into Urdu (national language of Pakistan). **Methods:** JSEQ-Urdu was developed by a 2 step forward/back translation by Urdu and English language experts, respectively. Content validity was determined by content validity index (CVI). The final Urdu version was administered to 75 pharmacy students at Punjab University College of Pharmacy, University of the Punjab, Lahore, Pakistan. The reliability of final Urdu version was assessed by Cronbach's alpha and interclass correlation (ICC) coefficients. Furthermore, an exploratory factor analysis (EFA) was conducted to assess the dimensionality of the instrument. **Results:** The CVI for all four items of JSEQ-Urdu reached 1. All corrected item-total correlation values were positive and above 0.30 (range: 0.443-0.550). Cronbach's alpha value of the questionnaire was satisfactory (0.69). Two weeks test-retest reliability was determined in 43 respondents and the ICC was found to be excellent (0.89). Similar to the original version, the results of our EFA revealed a single factor model in JSEQ-Urdu. **Conclusion:** JSEQ-Urdu is an easy, less time consuming, valid and reliable tool to assess sleeping problems among Urdu-speakers.

**Key words:** Patient Reported Outcome Measures, Psychometric, Sleep disturbances, Urdu.

## INTRODUCTION

Jenkins sleep evaluation questionnaire[1] (JSEQ) is one of the commonly used self-reported instruments to determine sleeping disturbances/problems.[2] JSEQ has four items namely "trouble falling asleep", "trouble staying asleep (i.e. wake up far too soon and can't get back to sleep)", "waking up several times per night", and "waking up after your usual amount of sleep feeling tired and worn out". These items are scored from 0-5, with 0 indicating "not at all" and 5, "22-30 days". The total JSEQ scores range from 0-20, with higher score indicating greater sleep disturbances. This instrument was developed to measure sleeping disturbances in clinical research and it has been validated not only in air traffic controllers but also the patients recovering from heart surgery.[1]

JSEQ has been translated and validated in other languages.[3,4] However, it has not been translated into Urdu which is the official language of Pakistan and it is being spoken in many south Asian countries. Therefore, the aim of this study was to translate JSEQ into Urdu and validate it. By doing so, we would provide an easy, simple and less time consuming instrument to evaluate sleep disturbances/problems among Urdu speaking population.

## METHODS

Permission to conduct this cross-cultural adaptation and validation study was obtained from Research Ethic committee of the Punjab University College of Pharmacy, University of the Punjab, Lahore, Pakistan. The guidelines of International Society of Pharmacoeconomics and Research Outcomes were followed for cross-cultural adaptation.[5] After receiving the permission to translate and Validate JSEQ from MAPI Research Trust, original JSEQ was translated into Urdu by 2 experts separately. After resolving the discrepancies, the Urdu version was back translated independently by 2 language experts. Inconsistencies between the back translation and the original JSEQ were resolved by the researchers and final Urdu version (JSEQ-Urdu) was formed. Content validation was performed by cognitive debriefing interviews among 10 pharmacy students. Content validity index on understandability, clarity and relevance was determined by reviewing the frequency of responses (yes or no). Items having content validity index of 0.8 or above were considered to have good content validity.[6] Psychometric properties of JSEQ-Urdu were evaluated among Pharmacy students that were recruited by convenience sampling from Punjab University College of Pharmacy, University of the Punjab. A verbal informed consent was obtained from every individual prior their recruitment. Contact information was also taken from participants for the test-retest procedure and participants were contacted within 14 days of recruitment by the researchers who re-administered JSEQ-Urdu.

Continuous and categorical variables were expressed as mean ± standard deviation (SD), and as number and percentages, respectively. The internal consistency of the study instrument was evaluated by Cronbach's α coefficient using cut-off value ≥ 0.70.[7] Reproducibility was determined by intra-class correlation coefficient (ICC) using cut-off value ≥ 0.70 indicating adequate reliability.[8] Exploratory factor analysis (EFA) was performed to determine the construct validity of JSEQ-Urdu. Kass and Tinsley recommended that 5-10 individuals per variable are adequate for factor analysis.[9] A minimum sample of 40 individuals (10 individuals: 1 item/variable) was needed in

this study. However, we took an extra sample (n = 75) to avoid biases, considering non-participation and/or incomplete filling of study instrument by participants. Statistical analysis were performed using SPSS version 22.0 for Windows (IBM-SPSS Inc. Armonk, NY), with $p < 0.05$ considered statistically significant.

## RESULTS

Ten pharmacy (4 males and 6 females; range 20-25 years) students that were enrolled for cognitive debriefing interviews described the items of JSEQ-Urdu as clear, understandable and relevant to sleep disturbances. The content validity index reached 1.0 for each item.

Of the 75 subjects recruited for psychometric validation of JSEQ-Urdu, 13 were excluded because of the errors in questionnaire completion. Demographic data of the study participants are given in Table 1. The median age of study participants was 21.0 years, with a preponderance of single females belonging to middle economy class. Inter-item total correlation matrix showed all items had correlation > 0.30 (Table 2). As shown in Table 3, all corrected item-total correlation values were positive and above 0.30 (range 0.443-0.550). Cronbach's alpha was 0.69 for all four items of JSEQ-Urdu. Moreover, two weeks test-retest reliability was determined in 43 respondents and the ICC was found to be excellent (0.89). EFA with oblique rotation was performed on the JSEQ-Urdu items and it revealed the presence of one factor that explained 53.8% of the variance. Table 4 shows the factor loadings for a single factor model.

## DISCUSSION

The main results of our study showed that JSEQ-Urdu was a valid and reliable self-reported instrument to measure sleep disturbances in Urdu speakers. Content validity index reached 1.0 for each item of the instrument that showed good content validity.[6] Cronbach's alpha of the original questionnaire was found out to be 0.79 for Air Traffic Controllers and 0.63 for patients

recovering from heart surgery.[1] Similarly, the Portuguese[3] and Turkish version of JSEQ[4] had good internal consistency (0.84 and 0.80, respectively). In previous researches using JSEQ, Cronbach's alpha was 0.78 for middle-aged women,[10] 0.80 for patients with unexplained chest pain,[11] and 0.77 for Japanese and British civil servants.[12] In current study, Cronbach's alpha was 0.69, slightly lower but still acceptable. Comparable to the findings of original as well as other translations of JSEQ,[1,3] 2 week test-retest reliability was excellent in our study. We conducted an EFA with Oblimin to check the dimensionality of JSEQ-Urdu items. Participants with missing data were excluded list wise prior the analysis. Kaiser–Meyer–Olkin coefficient (0.72)

### Table 2: Inter-item correlation matrix of the study instrument.

|  | Trouble falling asleep | Wake up several times per night | trouble staying asleep | Wake up tired and worn out |
|---|---|---|---|---|
| Trouble falling asleep | 1.000 |  |  |  |
| Wake up several times per night | 0.539 | 1.000 |  |  |
| Trouble staying asleep | 0.351 | 0.328 | 1.000 |  |
| Wake up tired and worn out | 0.376 | 0.340 | 0.356 | 1.000 |

### Table 3: Item-total statistics of the study instrument.

| Items | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|
| Trouble falling asleep | 0.550 | 0.351 | 0.600 |
| Wake up several times per night | 0.509 | 0.326 | 0.614 |
| Trouble staying asleep | 0.443 | 0.197 | 0.651 |
| Wake up tired and worn out | 0.461 | 0.214 | 0.657 |

### Table 4: Component Matrix[a] of the study instrument.

| Items | Component |
|---|---|
|  | 1 |
| Trouble falling asleep | 0.792 |
| Wake up several times per night | 0.767 |
| Trouble staying asleep | 0.674 |
| Wake up tired and worn out | 0.694 |

Extraction Method: Principal Component Analysis. a. 1 components extracted.

### Table 1: Demographic data of study participants.

| Characteristics | N (%) |
|---|---|
| **Age** (mean ± SD) | 21.6 ± 0.84 |
| **Gender** Male Female | 12 (19.4) 50 (80.6) |
| **Marital status** Married Single | 3 (4.8) 59 (95.2) |
| **Economic status** Lower economic class Middle economy class Upper economy class | 2 (3.2) 52 (83.9) 8 (12.9) |
| **Race** Punjabi Non-Punjabi | 58 (93.5) 4 (6.4) |

### Table 5: Kaiser Criterion.

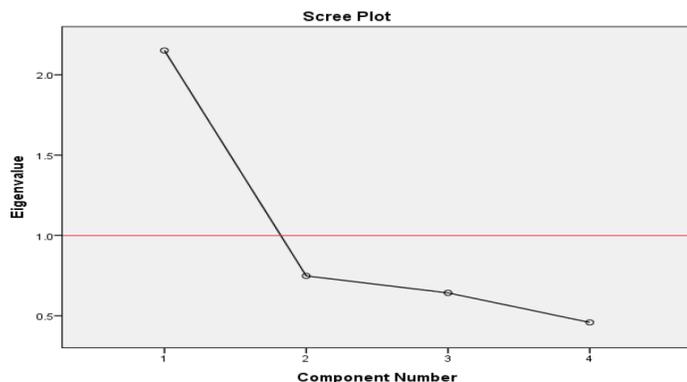| Total Variance Explained | | | | | | |
|---|---|---|---|---|---|---|
|  | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
| Component | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 2.152 | 53.788 | 53.788 | 2.152 | 53.788 | 53.788 |
| 2 | 0.748 | 18.695 | 72.483 |  |  |  |
| 3 | 0.642 | 16.059 | 88.542 |  |  |  |
| 4 | 0.458 | 11.458 | 100.000 |  |  |  |

Extraction Method: Principal Component Analysis.

Figure 1: Scree plot for factor solutions of JSEQ-Urdu items.

indicated that the sample size was adequate and Bartlett's Test of Sphericity ($\chi2 = 43.963$, $p < 0.001$) revealed correlation among the questionnaire items, and the data were suitable for EFA.[13,14,15] As expected, both Kaiser's criterion (Table 5) and scree plot (Figure 1) revealed a unifactorial structure that explained 53.8% of the variance. Our factor analysis findings were similar to the findings of original as well as Portuguese version of JSEQ.[1,3] Our validated JSEQ-Urdu can be obtained online from MAPI Research Trust for use by other clinicians and researchers.

## CONCLUSION

JSEQ-Urdu is an easy, valid and reliable self-administered instrument to evaluate the sleep disturbances among Urdu speaking population.

## ACKNOWLEDGMENT

## SOURCE OF SUPPORT

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## ABBREVIATIONS USED

**CVI:** Content validity index. **EFA:** Exploratory factor analysis. **ICC:** Interclass correlation. **JSEQ:** Jenkins sleep evaluation questionnaire. **SD:** Standard deviation.

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