



VALIDATION STUDIES

Validity and reliability of the Turkish version of the Jenkins Sleep Scale in psoriatic arthritis

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Abstract

Objective The aim of this study is to investigate the validity and reliability of the Turkish version of Jenkins Sleep Scale (JSS) in psoriatic arthritis (PsA).

Methods Patients with PsA according to Classification Criteria for Psoriatic Arthritis (CASPAR) were included in the study. Data about age, sex, body mass index (BMI), disease duration (month) and joint symptom duration (month) were noted. Psoriatic Arthritis Quality of Life (PsAQoL) Scale was used to assess the quality of life, Multidimensional Assessment of Fatigue (MAF) Scale was used to evaluate fatigue, and Pittsburgh Sleep Quality Index (PSQI) was used to evaluate sleep quality. The reliability of JSS scale was determined by internal consistency (Cronbach's alpha coefficient). Face validity and construct validity (convergent and divergent validities) were evaluated. The correlation of the JSS with the PSQI, MAF scale, and PsAQoL scale was assessed for convergent validity. The correlation of the JSS with age, body mass index (BMI), duration of joint symptoms and disease duration were assessed for divergent validity.

Results The mean age of 56 patients was 42.71 ± 11.79 . The Cronbach's alpha of the JSS was 0.862. The JSS had significant correlations with PSQI ($\rho = 0.653$, $P < 0.001$), MAF ($\rho = 0.457$, $P < 0.001$), PsAQoL ($\rho = 0.496$, $P < 0.001$). There were no significant correlations between JSS and age ($\rho = -0.052$, $P = 0.716$), BMI ($\rho = -0.085$, $P = 0.550$), disease duration ($\rho = 0.161$, $P = 0.276$) and duration of joint symptoms ($\rho = 0.107$, $P = 0.474$).

Conclusion The Turkish version of JSS is a valid and reliable instrument in PsA.

Keywords Psoriatic arthritis · Sleep · Sleep quality · Jenkins Sleep Scale

Introduction

Psoriatic arthritis (PsA) has been defined as inflammatory arthritis, usually seronegative, associated with psoriasis [1], classified in spondyloarthropathies. Patients with psoriasis have substantially impaired sleep quality compared with the general population [2, 3]. Psoriasis may have a direct effect on the development of sleep disorders due to the cutaneous symptoms and may have an indirect effect due to its association with systemic inflammatory disorders [4]. Duffin et al. suggested that history of psoriatic arthritis (PsA), pruritus,

pain, and overall emotional well-being are significant predictors of sleep disturbance in patients with psoriasis [2]. Strober et al. reported an association between sleep disturbance and the Psoriasis Area and Severity Index (PASI) scores, the presence of PsA, work productivity impairment, DLQI impairment (Dermatology Life Quality Index) and depression in patients with psoriasis [3].

Gezer et al. reported that sleep impairment is more common in patients with PsA compared to the general population and associated with generalized pain, anxiety, enthesitis, quality of life and levels of ESR and CRP [5]. Duruöz et al. reported that sleep quality in PsA patients is associated with quality of life, on the other hand, the severity of pain, enthesitis, skin lesions, and disease duration seem to not interfere with sleep quality for PsA [6].

Due to the effects of sleep disturbance on health and quality of life, some questionnaires to measure sleep disturbance have been developed. The Jenkins Sleep Scale (JSS) and the Pittsburgh Sleep Quality Index (PSQI) are two of the most

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commonly used scales [7–9]. The JSS was developed as an efficient instrument for use in clinical research to evaluate frequency and intensity of certain sleep difficulties. The scale has been validated with two different testing populations and has good internal reliability [7]. It is frequently used in epidemiologic studies [10]. JSS is a simple, self-reported and not time-consuming scale thus it might be useful in daily practice and clinical research.

The aim of this study is to investigate the validity and reliability of the Turkish version of JSS in patients with psoriatic arthritis.

Methods

Study design

This study was conducted as a psychometrics study.

Patients

The study included fifty-six patients with PsA, according to Classification Criteria for Psoriatic Arthritis (CASPAR), who were followed in the Rheumatology Division of Physical Medicine and Rehabilitation Department, Marmara University Faculty of Medicine. Patients with other diseases involving cognitive deficit were excluded from the study. The study was approved by the Ethical Committee of Marmara University Faculty of Medicine. Informed consent was obtained from all individual participants included in the study.

Assessment of quality of life, fatigue, and sleep quality

The Psoriatic Arthritis Quality of Life (PsAQoL) Index is a valuable tool for evaluating the quality of life in patients with PsA in clinical studies. It is a self-administered, 20-item questionnaire. The answers are restricted to true or not true (1–0), and the maximum score is 20 [11]. The validity study for the Turkish version of PsAQoL was performed by Duruöz et al. [12].

The Multidimensional Assessment of Fatigue (MAF) is a self-reported 16 item scale that measures fatigue according to four dimensions: degree and severity, distress that it causes, the timing of fatigue, and its impact on various activities of daily living. The original intention of the MAF was to evaluate fatigue in patients with rheumatoid arthritis (RA) [13]. But it has been used in other populations including ankylosing spondylitis [14]. The Turkish version of MAF was shown to be valid and reliable in different patient populations [15, 16].

The Pittsburgh Sleep Quality Index (PSQI) is a self-reported instrument used to measure the quality and patterns of sleep during the last month [8]. The scale consists of 19 items to assess seven components of sleep quality: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications and daytime dysfunction (score in each domain ranges from 0 to 3). Validity and reliability of the Turkish version have been reported [17].

The Jenkins Sleep Scale (JSS)

This questionnaire consists of four items that assess the sleep problems over the preceding 4 weeks: (a) trouble falling asleep, (b) trouble staying asleep, (c) wake up several times/night, and (d) wake up feeling tired. Each item is rated on a 6-point Likert scale (not at all = 0, 1–3 days = 1, 4–7 days = 2, 8–14 days = 3, 15–21 days = 4, 22–28 days = 5). The total score is ranging from 0 to 20, showing more disturbed sleep as it increases [7].

Translation of the JSS

The English version of JSS was the original scale used for translation and adaptation. Translation, back translation, and cross-cultural adaptation of the JSS scale into Turkish were done according to the standard procedure. Two authors who are proficient in English translated the questionnaire independently (forward translation). English back-translations from Turkish were completed, separately, by two authors who are proficient in English and also have no prior knowledge of the original version of the JSS. An expert committee consisting of forward and backward translators reviewed and compared the translations and finally developed the Turkish version of the JSS. For the face validity, the final Turkish version of JSS was tested by 20 patients with PsA to determine if they could understand the items. All the questions and answer options were fully understood by patients that demonstrated face validity.

Statistical analysis

The reliability of the JSS scale was assessed by internal consistency. The defining characteristics of the items of the scale were analyzed, and Cronbach's alpha coefficients and item-total correlations were calculated. Face validity and construct validity (convergent and divergent validities) were evaluated. The correlations between the JSS and the Pittsburgh Sleep Quality Index (PSQI) and its seven subgroups, Multidimensional Assessment of Fatigue (MAF) Scale and Psoriatic Arthritis Quality of Life (PsAQoL) Scale were assessed for convergent validity. The correlations between the JSS and age, body mass index (BMI), duration

Table 1 Descriptive statistics, correlations with total score and internal consistency for items of JSS

	Mean (SD)	At floor (%)	At ceiling (%)	Corrected item-total correlations	Cronbach's alpha if item deleted
Item 1	1.85 (1.69)	28.6	8.9	0.700	0.829
Item 2	2.05 (1.58)	14.3	10.7	0.779	0.796
Item 3	1.93 (1.57)	19.6	7.1	0.723	0.819
Item 4	2.44 (1.59)	10.7	14.3	0.640	0.852
Total	8.08 (5.35)	0	3.6	–	0.862

Table 2 The correlation between total JSS score and PSQI, MAF, PsAQoL scales

Variables	Rho	P
PSQI	0.653	<0.0001
MAF	0.457	<0.0001
PsAQoL	0.496	<0.0001

JSS Jenkins Sleep Scale, *PSQI* Pittsburgh Sleep Quality Index, *MAF* Multidimensional Assessment of Fatigue, *PsAQoL* Quality of Life in Psoriatic Arthritis

of joint symptoms and disease duration were assessed for divergent validity. Spearman's correlation coefficient was used to determine the correlations between parameters. The descriptive analysis was done for demographic data. $P < 0.05$ is accepted as significant. SPSS 20.0 (Statistical package for social sciences for Windows 20.0) program was used for the statistical analysis of all data acquired.

Results

The mean age of 56 patients (44 female, 12 male) with PsA was 42.71 ± 11.79 years. The median (min–max) duration of disease and the duration of joint symptoms were 24.0 (3–240) months and 36.0 (6–240) months, respectively. The mean body mass index (BMI) of patients was 32.15 ± 7.69 .

Reliability

The mean and standard deviation of each item, the floor and ceiling percentages have been presented as descriptive data in Table 1. Floor and ceiling effects were not detected except item 1 that has acceptable floor effect (28.6%). The Cronbach's alpha coefficient of the JSS for internal consistency was 0.862. Cronbach's alpha coefficients if item deleted and corrected item-total correlations were given in Table 1.

Construct validity

The JSS score had moderate and significant positive correlations with PSQI, MAF and PsAQoL scales, indicating convergent validity (Table 2). As for the correlations between

Table 3 The correlation between total JSS score and PSQI subgroups

PSQI subgroups	Rho	P
Subjective sleep quality	0.408	0.002
Sleep latency	0.364	0.006
Sleep duration	0.440	0.001
Habitual sleep efficiency	0.272	0.042
Sleep disturbances	0.508	<0.0001
Use of sleeping medications	0.136	0.319
Daytime dysfunction	0.440	0.001

JSS Jenkins Sleep Scale, *PSQI* Pittsburgh Sleep Quality Index

Table 4 The correlation between total JSS score and non-functional parameters

Variables	Rho	P
Age	–0.052	0.716
Duration of disease	0.161	0.276
Duration of joint symptoms	0.107	0.474
Body mass index (BMI)	–0.085	0.550

JSS Jenkins Sleep Scale

the JSS total score and PSQI subgroups, statistically significant low-moderate correlations were detected with subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, daytime dysfunction subgroups of PSQI, but there was no correlation with “need medication to sleep” subgroup (Table 3). There were no significant correlations between JSS score and BMI, duration of disease and duration of joint symptoms that showed divergent validity (Table 4).

Discussion

The primary intention of this study was to establish the psychometric properties of the Turkish version of JSS in patients with PsA.

Cronbach's alpha coefficient for internal consistency was 0.862. It means that JSS has good reliability, which indicates a high degree of internal homogeneity. Cronbach's alpha

was higher in our study (0.86) compared to the original one (0.79) [7] but similar to the Portuguese version of JSS (0.84) [18].

The JSS has a good significant correlation with functional parameters (convergent validity), on the other hand, it has no significant correlations with non-functional parameters (divergent validity). It means that JSS has adequate construct validity among the patients with PsA.

JSS consists of four items that assess sleep problems including falling asleep, trouble staying asleep, waking up several times during sleep and waking up feeling tired. However, consisting of only four items, we found that JSS significantly correlated with PSQI parameters (subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbance, and daytime dysfunction), excluding “use of sleeping medication”. In another study, the authors found subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, daytime dysfunction subgroups of PSQI and total PSQI scores significantly higher in patients with PsA compared to healthy control except using sleeping medication [5]. According to these results, “using sleeping medication” may not be one of the dimensions in the assessment of sleep quality in PsA.

We found JSS scores significantly correlated with PsAQoL scores. Similarly, Gezer et al. [5] and also Duruöz et al. [6] reported a significant association between sleep impairment and quality of life in PsA. Furthermore, Strober et al. suggested that subjective symptoms, such as health-related quality of life, seem to be more closely correlated with sleep impairment than objective psoriasis signs such as PASI and the presence of PsA [3]. This data suggests that sleep quality in PSA may be one of the determinants of quality of life. Thus, emphasizing the importance of assessing the sleep quality in patients with PsA.

In addition, we found JSS scores significantly correlated with MAF scores. It has been suggested that patients with rheumatological diseases are a risk group for sleep disorders and sleep disturbances directly influence fatigue [19]. Evers et al. proposed that fatigue is a consequence of sleep disturbance caused by active disease and pruritus in patients with psoriasis [20]. On the other hand, Carneiro et al. suggested that patients with psoriatic arthritis have reduced physical activity, reduction of self-esteem, depression, and reduction of quality of life, leading to common somatic manifestations such as fatigue [21]. These observations indicate that sleep disturbances may be closely related to fatigue in patients with PsA.

The correlation between JSS and duration of disease was also evaluated in the present study. We determined that there was no significant correlation between JSS and duration of disease and duration of joint symptoms. Duruöz et al. [6] and Gezer et al. [5] also reported that disease duration is not related to sleep quality in PsA patients.

These results may have been affected by the short duration of the mean disease duration in the studies.

Although obesity is associated with sleep disorders such as obstructive sleep apnea and insomnia [22], in the present study, we found no correlation between JSS and body mass index. Duffin et al. demonstrated that obesity is not a significant predictor of sleep interference in patients with psoriasis [2]. In addition, Strober et al. [3] and Gezer et al. [5] also reported no significant association between sleep quality and body mass index in PsA patients. According to these data, contrary to expectations, obesity does not seem to be associated with sleep quality in PsA.

We determined no significant correlation between JSS scores and age. A survey study results suggest that many of the sleep problems are common in older adults and secondary to medical illness rather than to aging per se [23]. In our study, the result of no association between age and sleep impairment might have been related to younger patient population and the accordingly lower number of comorbid diseases.

In conclusion, The Jenkins Sleep Scale is a valid and reliable instrument in patients with PsA in the Turkish population. Due to the effects of sleep disturbance on health and quality of life, it will be important to assess sleep quality in patients with PsA. For this purpose in routine clinical practice, JSS is a simple, accurate and not time-consuming instrument to assess self-reported sleep disturbances in patients with PsA.

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Compliance with ethical standards

Conflict of interest The authors declare no conflict of interest.

Ethical approval The study was approved by the Ethical Committee of Marmara University Faculty of Medicine. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from all individual participants included in the study.

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