# Testing the Psychometric Properties of the Postpartum Sleep Quality Scale in Turkish Women

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## ABSTRACT

**Background:** Postpartum sleeplessness has been observed to be an important health problem in Turkey. However, no scale is currently available to evaluate quality of sleep in Turkish postpartum women.

**Purpose:** The aim of this study was to test the validity and reliability of the Turkish Postpartum Sleep Quality Scale (T-PSQS).

**Methods:** The sample of this methodological study surveyed 100 women during their first 2 postpartum weeks. Data were obtained using a personal characteristics form and the PSQS. The PSQS is a 5-point scale ranging from 0 to 4. The validity of the PSQS was tested using content validity index and confirmatory and exploratory factor analyses, and the reliability of the scale was tested using Cronbach's alpha.

**Results:** The opinions of eight experts were canvassed to test the validity of the T-PSQS. The content validity index showed that the scale had high validity (.92). The factor analysis that was conducted to test the construct validity of the scale indicated that the scale was composed of three factors with eigenvalues over 1.00 and that the total Cronbach's alpha coefficient was .88. The Cronbach's alpha for the subscales "Infant night care-related daytime dysfunction," "Physical symptoms-related sleep inefficiency," and "Sleep quality or sleep" were .82, .86, and .80, respectively.

**Conclusions:** Content validity, construct validity, and reliability analyses of the T-PSQS revealed that the scale may be used to measure postpartum sleeplessness levels and sleep quality in Turkish women.

**KEY WORDS:**
psychometric properties, postpartum women, Turkish Postpartum Sleep Quality Scale.

## Introduction

Sleep is necessary for proper health maintenance due to its impacts on the physiological, psychological, and social realms (Stremler, Sharkey, & Wolfson, 2017). The postpartum period is a challenging stage of life when women start to experience motherhood. One main health problem encountered during that period is decreased quality of sleep and sleeplessness (Lawson, Murphy, Sloan, Uleryk, & Dalfen, 2015). New mothers need to sleep 20% more at night than the norm for women (Gress et al., 2010). However, this sleep requirement may not be fulfilled, and postpartum sleep problems may arise because of physical problems such as uterus contractions and incision-related pain, infant care, lactation, perceived stress, and marriage-related problems (Stremler et al., 2017). Although these problems normally appear during the postpartum period, long-lasting failure to fall asleep may cause permanent sleeplessness, resulting potentially in chronic tiredness, fatigue, and depression and even postpartum pain (Bhati & Richards, 2015; Dørheim, Bondevik, Eberhard-Gran, & Bjorvatn, 2009; Sivertsen, Petrie, Skogen, Hysing, & Eberhard-Gran, 2017; Song, Chae, & Kim, 2014).

Studies performed to reveal sleep and sleeplessness levels and to improve sleep quality in postpartum women have revealed that postpartum women have more sleep disturbances, shorter total sleep times, lower-quality sleep, and more low-speed eye movements than both their nonpostpartum peers and pregnant women (Bei, Milgrom, Ericksen, & Trinder, 2010). A study from Iran found that postpartum women experienced more sleep problems than pregnant and menopausal women (Nami, Saremi, & Madadi, 2010). Taiwanese postpartum women who were over 18 years old and who had given birth to a single and full-term baby during the previous 6-week period were found to have considerably high sleeplessness levels (87.5%; Ko, Chen, Wang, & Su, 2014). Moreover, 50.9% of Malaysian mothers and 77.8% of Japanese mothers were reported to experience sleep problems (Mindell, Sadeh, Kwon, & Goh, 2013).

In Turkey, a few studies have examined the level of postpartum sleeplessness in women. One of these revealed sleep problems to be the most frequently perceived health problem among 55 postpartum women living in rural areas (Yildiz & KüÓükşahin, 2011). Another study revealed that 81.8% of the participant women had experienced sleep problems during the second week postpartum (Erbaş, 2013). About half of 245 primiparous women who gave vaginal birth with a single baby expressed that they did not get enough sleep and perceived fatigue during 2–4 weeks postpartum (Elmas & Aluş-Tokat, 2016).

It is known that healthy adults sleep 7 or more hours per night on a regular basis to promote optimal health (Watson

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et al., 2015). However, the duration of sleep considerably decreases in the postpartum period. The mean daily sleep duration for first-year postpartum women was reported as 6.7 ± 0.9 hours by Taveras, Rifas-Shiman, Rich-Edwards, and Mantzoros (2011). Montgomery-Downs, Insana, Clegg-Kraynok, and Mancini (2010) found that mothers slept intermittently and inefficiently, although they did not report differences in duration of night sleep during the postpartum 2nd–16th weeks. In view of the literature, it is clear that postpartum women need to sleep better at night or to nap during the day.

Several studies have shown the potential of several interventions to increase sleep quality in postpartum women, including feet reflexology (Li, Chen, Li, Gau, & Huang, 2011; Varghese, George, & Swamy-Gowda, 2014), aromatherapy (Keshavarz Afshar et al., 2015; Mirghafourvand, Charandabi, Hakimi, Khodaie, & Galeshi, 2016), back massage (Ko & Lee, 2014), and drinking a glass of water that has been infused with three drops of orange shield oil (Yang, Yu, & Chen, 2013). Sleep quality in postpartum women was measured in the abovementioned studies using general sleep scales such as the Pittsburg Sleep Quality Index, Stanford Sleepiness Scale, and Epworth Sleepiness Scale. Various tools for measuring postpartum sleep may increase the possibility of bias. Besides, these scales were originally created to assess general sleep status, and it has been suggested that general sleep scales are inadequate to evaluate postpartum sleep problems and that postpartum-period-specific scales should be used instead (Hung & Chen, 2014).

The Postpartum Sleep Quality Scale (PSQS) is the only scale that has been specifically designed for use during the postpartum period. This scale was developed by Yang et al. (2013) to specifically measure postpartum sleep quality. The scale has two factors and 14 items. It is a valid and reliable scale, with a Cronbach's alpha of .81. PSQS was used by Hung and Chen (2014) to evaluate the postpartum sleep status of Taiwanese women. In addition, Chen and Chen (2015) investigated the effects of lavender tea on sleep quality in Taiwanese women, and Chang and Chen (2016) used the PSQS to investigate the effects of German chamomile tea on sleep quality.

Postpartum sleeplessness has been observed to be an important health problem in Turkey. However, no valid and reliable scale is currently available to evaluate sleep quality in Turkish postpartum women. Thus, researchers to date have used general questionnaires that were developed based on the literature (Elmas & Aluş-Tokat, 2016; Erbaş, 2013; Yildiz & KüÓükşahin, 2011). Therefore, this study aimed to test the validity and reliability of the Turkish PSQS (T-PSQS) and to evaluate sleep quality in Turkish postpartum women.

## Methods

This was a methodological study. The sample included women who gave birth in two university hospitals in southern Turkey between April and May 2016, with data collected through the second week postpartum. The annual number of vaginal births in the two hospitals during the study period was nearly 1,500, mostly to women in the middle and upper socioeconomic classes.

The literature recommends that the samples of studies that are performed to test the validity and reliability of a scale should be 5–10 times as high as the number of the items on that scale (Polit & Beck, 2013). The sample size of this study was first planned to be 98, which is seven times as high as the number of items on the PSQS (n = 14), and then increased to 100 to facilitate calculations. Convenience sampling was used. Turkish-speaking women who allowed being visited at home, were able to read and write, were 18–40 years old, and gave vaginal birth to their first child were included in the sample. Exclusion criteria included postpartum complications such as hemorrhaging, infections, thromboembolic disease, coagulopathies, psychologic complications and psychiatric disorders, stillbirths, infants born with abnormalities, multiple pregnancy, chronic diseases, and sleep-related illnesses. Cesarean births may introduce surgical intervention-related influences that may affect sleep and rest time. Likewise, multiparity is a potential confounding variable for sleep and rest time. Thus, otherwise qualified individuals who were described by either of these two criteria were excluded from participation.

Those women who met the inclusion criteria were approached randomly within 24 hours of vaginal delivery, informed about the study, and asked to provide consent to participate. Contact information for the women was collected. Those who provided consent were informed that data would be collected 2 weeks later. Two weeks after birth, these women were phoned and interviews were conducted.

## Data Collection

Data were collected using the personal characteristics form, which was developed by the researchers based on the literature (Chen & Chen, 2015; Erbaş, 2013; Hung & Chen, 2014; Lawson et al., 2015; Yang et al., 2013). The form included 13 questions on sociodemographic and postpartum characteristics such as infant gender, infant feeding style, frequency of breastfeeding, and influences on postpartum sleep such as daily working time, starting work, and PSQS.

The face-to-face interviews were carried out by the researchers either in participants' homes or during return visits to the maternal and child healthcare centers. Before commencing the interview, the researchers briefed each participant on the structure of the standardized interview. First, sociodemographic and postpartum characteristics were recorded, and then the participant was given the PSQS. Each interview took 15–20 minutes.

The PSQS was first developed in Chinese by Yang et al. (2013) to measure sleep quality in the postpartum period. The original 14-item PSQS has been found to be a reliable scale, having two factors with eigenvalues greater than 1.00 and a Cronbach's alpha of .81. The scale was translated

into English by Yang et al. so that it could be used internationally, and its English version was also found to be valid and reliable, incorporating such items as "trouble sleeping resulting in blue mood," "wake up in the middle of the night," and "have trouble sleeping because of worry about baby's condition."

The PSQS is scored using a 5-point Likert scale ranging from 0 to 4 (0 = *never*, 1 = *rarely*, 2 = *sometimes*, 3 = *often*, and 4 = *always*). The items with an asterisk are scored in reverse order. Possible scores for the PSQS range from 0 to 56, with no cutoff point designated and higher scores indicating poor sleep quality.

## Study Procedure

The validity and reliability of this study were tested using the four steps discussed below.

### Step 1: translating the Postpartum Sleep Quality Scale into Turkish and testing linguistic validity

First, Yang et al. (2013), who developed PSQS, gave permission via e-mail to adapt this scale into Turkish. Next, the scale was translated into Turkish by the researchers and a measurement and evaluation expert and was renamed T-PSQS. The items of the obtained version were checked to determine whether they were understandable and clear, and necessary revisions were made. Afterward, the T-PSQS was back-translated into English by a linguist with a good command of both English and Turkish. Then, each item was examined in both English and Turkish versions by the researchers to confirm consistency. The items were revised when necessary, and thus, the scale was ready for psychometric evaluation. Finally, the back-translated and revised version of the scale was sent to Yang et al., and their consent was obtained.

### Step 2: testing the content validity of the Turkish Postpartum Sleep Quality Scale

The content validity of the T-PSQS was tested using the content validity index (CVI). Eight experts in obstetrics nursing, midwifery, and medicine used CVI to evaluate each of the items. Moreover, the experts evaluated the items in terms of word choice, length, and scoring. According to the Lawshe technique, which is a widely used method of measuring content validity that was developed by Lawshe, at least five experts should independently assign to each item a score of 1, 2, or 3, which corresponds to "unnecessary," "useful/insufficient," and "necessary," respectively. It has been reported in the literature that a mean CVI score of .80 or more is acceptable in terms of validity (Polit & Beck, 2013).

### Step 3: testing the construct validity of the Turkish Postpartum Sleep Quality Scale

The Kaiser–Meyer–Olkin (KMO) test was used to determine the sufficiency of the sample size, and Bartlett's test was used to determine the appropriateness of the correlation matrix for factor analysis. KMO values greater than .50 indicate a sample size that is sufficient for factor analysis (Polit & Beck, 2013). The construct validity of the scale was tested using confirmatory factor analysis (CFA) and exploratory factor analysis (EFA). First, in CFA, goodness-of-fit index (GFI) was used to determine whether the obtained data fit the model well. To this aim, the chi-square test ($\chi^2$), $\chi^2/SD$, root mean square error of approximation (RMSEA), GFI, comparative fit index (CFI), and adjusted GFI (AGFI) were calculated. For EFA, principal component analysis and varimax rotation were used. The Kaiser–Guttman principle was adopted, and those factors with eigenvalues greater than 1 were selected to determine the factor structure (Polit & Beck, 2013).

### Step 4: testing the reliability of the Turkish Postpartum Sleep Quality Scale

Item analyses included calculations of item means, standard deviations, and item-to-total correlations. To test the reliability of the T-PSQS, item–total correlation and Cronbach's alpha were utilized. The Cronbach's alpha coefficient was calculated to evaluate internal consistency, with .70 set as the lowest acceptable Cronbach's alpha coefficient (Polit & Beck, 2013).

## Ethical Considerations

Ethical approval was obtained from the ethical committee of the Antalya Hospital (Approval number 10/7, date of approval: 06/11/2014). All of the participants provided written informed consent and were assured that their participation was voluntary and that they could withdraw unconditionally at any time. Furthermore, the participants were informed that all obtained data would be kept confidential.

## Data Analysis

Data were analyzed using SPSS 20.0 (SPSS, Inc., Chicago, IL, USA). The scale was evaluated using mean, percentage, standard deviation, KMO, Bartlett's test, Cronbach's alpha, and item–total correlation. Generally, in the scale validity analysis, the factor structure of the scale describes the EFA. Then, this structure should be verified with the CFA. Therefore, both EFA and CFA were used in this study. Factor analyses were performed using AMOS v20.0.

One-way analysis of variance and the Pearson correlation test were used to elicit the relationships between T-PSQS scores and demographic characteristics. A *p* value < .05 was considered significant.

## Results

This study was completed with 100 primiparae during their second postpartum week. The mean age of participants was 25.4 ± 6.0 years, 43% were primary school graduates, and 61% were housewives and earned a moderate income. The mean daily duration of doing housework

during the second postpartum week was 3.73 ± 1.1 hours (minimum [min] = 2 hours, maximum [max] = 6 hours; Table 1). Although 39% had been employed before their pregnancy, none of the participants had returned to work at the time of data collection.

## Duration of Sleep and the Total Mean Score for Turkish Postpartum Sleep Quality Scale

The mean duration of sleep was 6.9 ± 0.94 hours (min = 5 hours, max = 8 hours), and the mean daily duration of staying in bed was 7.94 ± 0.90 hours (min = 4 hours, max = 11 hours). The mean total score for T-PSQS was 30.2 ± 6.90 (min = 18, max = 47).

## Content Validity

The experts found that all of the items on the T-PSQS were valid, with some of the items revised for clarity. For

**TABLE 1.**

### *Sociodemographic Characteristics of the Participants (N = 100)*

| Characteristic | *n* | % |
|---|---|---|
| Age (*M* and *SD*), years | 25.4 | 6.0 |
| 18–22 | 40 | 40 |
| 23–27 | 28 | 28 |
| 28–39 | 32 | 32 |
| Education | | |
| Primary school | 43 | 43 |
| High school | 37 | 37 |
| University | 20 | 20 |
| Occupation | | |
| Housewife | 61 | 61 |
| Employed | 39 | 39 |
| Income | | |
| Lower than expenditures | 29 | 29 |
| Equal to expenditures | 61 | 61 |
| Higher than expenditures | 10 | 10 |
| Type of family | | |
| Nuclear | 84 | 84 |
| Extended | 16 | 16 |
| Pregnancy | | |
| Wanted/planned pregnancy | 89 | 89 |
| Unwanted/unplanned pregnancy | 11 | 11 |
| Daily housework time (hours; *M* and *SD*) | 3.73 | 1.1 |
| Infant gender | | |
| Female | 58 | 58 |
| Male | 42 | 42 |
| Infant nutrition | | |
| Breastfeeding only | 85 | 85 |
| Breastfeeding and formula | 15 | 15 |

*Note.* Participants' age was from 18 to 39 years. Daily housework time was from 2 to 6 hours.

example, as "blue mood" in Item 13 did not make sense in the full Turkish translation, this word was reworded to convey "a calm and peaceful environment" in accordance with the experts' comments. The CVI scores for the T-PSQS that were assigned by the experts ranged from .81 to 1.00, with a mean score of .92. As a result, the T-PSQS was assessed as having high content validity. The scale was pilot tested on five women, and no linguistic problems were identified. Data obtained from the pilot test were not used for other evaluations related to the scale.

## Construct Validity

The KMO result was .87, and the Bartlett's test result was 720.367 ($p$ < .001), showing that the sample size was sufficiently large to conduct factor analysis and the psychometric testing of a scale comprising 14 items. First, to test the hypothesized configuration of the original factor structure of the scale (two-factor model) developed by Yang et al. (2013), the data were subjected to CFA. The results revealed that the 14-item two-factor model was not the best fit across all model fit indices and less acceptable values were observed in terms of RMSEA, AGFI, CFI, and GFI. The most superior fit was observed for the three-factor model. This model was found to have a good fit based on $\chi^2$ = 154.37, $SD$ = 51, and $\chi^2/df$ = 1.76. RMSEA was .076, and as this value was < .10, the model was considered acceptable. The GFIs in the model, namely, AGFI, CFI, and GFI, that were created to test the resultant model were .86, .95, and .92, respectively, further supporting that the model was acceptable.

The EFA for the T-PSQS was made using principal component analysis and varimax rotation. The analysis showed that the T-PSQS had a three-factor structure with an eigen value of over 1.00. This factor structure explained 64.87% of the total variance. The EFA result was consistent with the CFA result.

As in the original scale, Items 4, 5, 7, 8, 11, and 12 were loaded onto Factor 1. As these items were related to infant care sleep problems resulting in functional losses in daily activities, Factor 1 was titled "infant night care-related daytime dysfunction." Items 3, 6, 9, 10, and 13 were loaded onto Factor 2. As these items were related to insufficient sleep due to postpartum physical symptoms, Factor 2 was titled "physical symptoms-related sleep inefficiency." Items 1, 2, and 14 were loaded on Factor 3. As these items were positive statements scored in the reverse order and were related to sleep quality, Factor 3 was titled "sleep quality or sleep" (Table 2).

## Reliability

With the internal consistency analysis, it was determined that item–total correlation coefficients of any items were not lower than .30. In fact, item–total correlations of the T-PSQS ranged between .35 and .73 The Cronbach's alpha reliability coefficient was .88, suggesting high reliability. The Cronbach's alpha was .82 for the subscale "infant night care-related daytime dysfunction," .86 for the subscale "physical symptoms-related

**TABLE 2.**
*Item Score for the T-PSQS and Distribution of Item–Total Correlations*

| In the Last 2 Weeks | Mean | SD | Factor Loading | Item–Total Correlation ($r$) |
|---|---|---|---|---|
| Factor 1: Infant night care-related daytime dysfunction (Cronbach's α = .82) | | | | |
| Item 4. Waking up in the middle of the night | 3.34 | 0.64 | .799 | .732 |
| Item 5. Waking up early in the morning | 3.28 | 0.75 | .819 | .350 |
| Item 7. Having sleep problems due to infant care at night | 2.90 | 1.02 | .807 | .515 |
| Item 8. Having sleep problems due to infant-related distress | 2.66 | 0.69 | .813 | .461 |
| Item 11. Having sleep problems resulting in not feeling energetic throughout the day | 2.56 | 0.88 | .804 | .564 |
| Item 12. Having problems resulting in not feeling energetic during an activity | 2.06 | 1.00 | .796 | .651 |
| Factor 2: Physical symptoms-related sleep inefficiency (Cronbach's α = .86) | | | | |
| Item 3. Difficulty in falling asleep | 2.29 | 0.87 | .809 | .504 |
| Item 6. Having to wake up to go to the rest room | 1.39 | 0.98 | .794 | .677 |
| Item 9. Having sleep problems due to postpartum physical conditions | 2.02 | 1.18 | .792 | .686 |
| Item 10. Having sleep problems due to nightmares | 0.87 | 0.81 | .798 | .668 |
| Item 13. Having sleep problems in a calm and peaceful environment | 1.35 | 0.95 | .797 | .647 |
| Factor 3: Sleep quality or sleep efficiency (Cronbach's α = .80) | | | | |
| Item 1. Falling asleep in 30 minutes[a] | 3.92 | 0.83 | .819 | .506 |
| Item 2. Having actual sleep for more than 7 hours per night[a] | 2.84 | 0.87 | .822 | .438 |
| Item 14. Being satisfied with sleep quality in general[a] | 2.84 | 0.76 | .825 | .440 |

*Note.* Cronbach's α = .88. T-PSQS = Turkish Postpartum Sleep Quality Scale.
[a]Reverse scored.

sleep inefficiency," and .80 for the subscale "sleep quality or sleep efficiency." This further supported the construct validity analysis previously reported. The item–total correlations and Cronbach's alphas are presented in Table 2.

## Relations Between the Turkish Postpartum Sleep Quality Scale and Demographic Characteristics

There was a significant relationship between age and T-PSQS scores ($r$ = .198, $p$ = .04). Older age was associated with poor sleep quality. The correlation between household hours and T-PSQS scores was also significant ($r$ = .234, $p$ = .01); poor sleep quality was associated with daytime household hours. However, no significant relationship was found between T-PSQS scores and education ($F$ = 0.321, $p$ = .72), working status before pregnancy ($F$ = 2.893, $p$ = .092), type of family ($F$ = 0.927, $p$ = .228), infant gender ($F$ = 2.362, $p$ = .128), type of infant feeding (breastfeeding alone or breastfeeding combined with formula; $F$ = 0.386, $p$ = .536), and frequency of breastfeeding ($F$ = 0.018, $p$ = .982).

## Discussion

### Instrument Evaluation

The PSQS is a comprehensive instrument for assessing sleep quality and the only scale specifically designed to assess postpartum sleep quality. This scale has been used in several studies in Taiwan (Chang & Chen, 2016; Hung & Chen, 2014). This study was performed to test the psychometric properties of the T-PSQS in the following stages: content validity, construct validity, and reliability. The results suggest that the T-PSQS is a reliable and valid measure for evaluating postpartum sleep quality in Turkish women.

Items on the T-PSQS were initially assessed in terms of cultural appropriateness. A group of experts specializing in obstetrics and medicine were requested to analyze the items by assigning CVI scores, which provided a quantitative proof for content validity. In fact, they evaluated whether the statements were suitable and proper for the research population and whether the format of the statements was suitable and submitted their recommendations for revisions. It is desirable that interexpert agreement on the items should be at least 80%, with a CVI of .80 or more (Polit & Beck, 2013). In this study, the CVI scores for the T-PSQS were found to be quite high. Higher CVI scores mean that the scale is both understandable and culturally appropriate. Consequently, the 14-item T-PSQS was found to have a high content validity for measuring sleep quality in Turkish postpartum women. Furthermore, these findings suggest that the PSQS may be amenable for use in different languages and countries.

In this study, both CFA and EFA were used to test the construct validity of the T-PSQS. First, CFA was used to establish the number of dimensions/factors on which a group of items is loaded. In the original version of the scale, Yang et al. (2013) used EFA to confirm the construct validity

of PSQS. They found that the scale had a two-factor structure, which explained 44.49% of the total variance. The factorial structure that best fits our data was different from the PSQS, explaining 64.87% of the total variance. It can be seen clearly that the T-PSQS explains a higher total variance than the original scale. At the conclusion of CFA and EFA, the T-PSQS was found to have a three-factor structure, which differed from the original version. It was observed that items accumulated to factors according to the positive or negative perceptions of sleep quality on the T-PSQS. Besides, the items that were loaded on the first two factors in the T-PSQS were slightly different from those in the original scale. In this study, Factor 1 was titled "infant night care-related daytime dysfunction" and Factor 2 was titled "physical symptoms-related sleep inefficiency." Unlike the original scale, Factor 3 in the T-PSQS was titled "sleep quality or sleep" because of its content. Factor 3 in the T-PSQS is an indicator that women are able to sleep well.

CFA is a statistical technique that is used to verify the factor structure of a set of observed variables. CFA allows the researcher to test the hypothesis that a relationship exists between observed variables and their underlying latent constructs (Polit & Beck, 2013). We used CFA as a first step to check whether this new structure was fitting with our sample. A CFA of the PSQS was not done in the original version, and this study was the first to perform a CFA of the PSQS in a Turkish population. In this study, the model fit of the T-PSQS, as evaluated using GFIs, was good, and the CFA yielded three factors. T-PSQS and its subscales were found to have good internal consistency.

In fact, the item–total correlation coefficients were .35–.73 for the T-PSQS, which are similar to the ones in the original scale (.43–.76). Item–total correlation coefficients that exceed .30 indicate that this item measures well what the scale is intended to measure. In this study, it was detected that the item–total correlations of some items such as Items 3 (.504), 5 (.350), and 8 (.461) were not as high as those of most items, indicating that the discrimination power of these items is relatively low, although still acceptably reliable.

Internal consistency is the most important indicator of scale reliability. Internal consistency of the T-PSQS (.88) was found to be acceptable (Cronbach's alphas: Factor 1 = .82, Factor 2 = .86, and Factor 3 = .80). These values indicate that the T-PSQS and its components have good internal consistency. The reliability coefficient of the T-PSQS was found to be higher than that of the original scale (.81; Yang et al., 2013). In multidimensional scales, when the number of items in a subscale is lower than others, the alpha value of that subscale will be lower than the alpha value of the total scale (Polit & Beck, 2013). Nevertheless, it must be noted that the numbers of items in each subscale of the T-PSQS were lower than each subscale in the PSQS. Besides, in other studies in Taiwan, Cronbach's alphas for the PSQS were reported to be .76 (Chen & Chen, 2015) and .78 (Chang & Chen, 2016), which were lower than the one found in this study. Cronbach's alpha coefficient assumptions dictate

that each item is a linear component of the total score and that the scale features the facility of computability (Polit & Beck, 2013). Thus, the facility of computability of the T-PSQS is slightly higher than PSQS.

## Turkish Postpartum Sleep Quality Scale Demographic Response Patterns

In this study, the participants earned a mean score of 30.2 ± 6.9 for the T-PSQS. The range of possible scores is 0–56 for the T-PSQS because it is a 5-point Likert scale ranging from 0 to 4 with 14 items. As the scores increase, the quality of sleep decreases. In view of scale features, the mean score of participants suggests that Turkish postpartum women have a sleep quality that is higher than the average total T-PSQS score. In a study that was conducted in Turkey to evaluate the frequency of sleeplessness in postpartum women, 81.8% of the participants were found to experience sleeplessness during the second postpartum week (Erbaş, 2013). It is known that postpartum sleep, activities, resting, motherhood, and social relationships vary from society to society depending on cultural features (Fadzil, Shamsuddin, & Wan Puteh, 2016; Mahiti, Kiwara, Mbekenga, Hurtig, & Goicolea, 2015). Women in Turkey are encouraged to stay at home until 40 days postpartum, during which time they are accompanied and face restrictions on permissible physical activities (Aydin & Oskay, 2013). However, this study showed that, in contrast to the abovementioned traditional approach, participants did household work for a mean time of 3.73 ± 1.1 hours every day and that, as household time increased, their sleep quality decreased. In other words, Turkish women are now less likely to follow traditional postpartum protocols, which are affecting their sleep quality. One prior study showed that an evidence-based postnatal education for parents should highlight the positive relationship between reduced daily household workloads and sleep quality for mothers (Hung & Chen, 2014). Turkish postpartum women need more support from health professionals to enhance their sleep quality in the postpartum period. Having a better understanding of postpartum sleep patterns and related factors may help allow the planning of interventions by healthcare professionals to improve the sleep quality of postpartum women. Moreover, healthcare professionals should help women better confront and manage their pain, discomfort, and fear (Hung & Chen, 2014). Besides, it is known that complementary therapies are useful in the relief of sleeplessness and increase sleep quality postpartum (Keshavarz Afshar et al., 2015; Li et al., 2011; Selvi & Boz, 2016).

In Turkey, postpartum care management has been standardized by the Ministry of Health. In Turkey, every birth should be performed in the hospital, and the length of stay in hospital for postpartum mothers has decreased progressively in recent years. According to the "Post-natal Care Management Guideline" (Ministry of Health, Republic of Turkey, Public Health Agency of Turkey, and Department of Women's Health and Reproductive Health, Ankara, 2014), women are

normally hospitalized for 24 hours after vaginal births and for 48 hours after cesarean births. This guide recommends that postpartum women must receive six follow-ups, of which three should be in a hospital and three should be conducted at home by nurses and midwifes after discharge on the following days: (4) follow-up between 2 and 5 days, (5) follow-up between 13 and 17 days, and (6) follow-up between 30 and 42 days. Furthermore, according to the guide, mothers' postpartum complaints (bleeding, elimination, pain, etc.) and vital signs and mother–infant interaction must be evaluated. In addition, information, counseling, and care on topics such as breastfeeding, nutrition, and sexuality should be provided by healthcare professionals. It is recommended in the guide that mothers should be encouraged to have sufficient time for sleeping and resting during the 24 hours after delivery and that their relatives should be informed about the new mothers' need for sleep. Moreover, women should be asked about their sleep, rest, and tiredness at 2–5 days postpartum and during the second and sixth weeks after delivery. However, no standard form is available to conduct this evaluation. The results of this study suggest that the T-PSQS may be an effective tool for evaluating sleep quality in postpartum women in Turkey.

## Limitations of the Study

The validity and reliability of the T-PSQS were only tested on primiparae giving vaginal birth. Multiparous women and primiparae receiving cesarean sections were excluded from participation. Therefore, using the T-PSQS on these excluded groups of women may be invalid. In addition, the women included in this study earned moderate incomes. Thus, the validity and reliability of the scale should be tested on women living in rural areas, on those with low incomes, and on those with high incomes.

## Conclusions

The T-PSQS is a simple test consisting of 14 items and three factors, which is an easy-to-use instrument for healthcare professionals. It is a reliable and highly valid instrument for assessing the sleep quality of new mothers during the postpartum period. However, further studies are needed to determine whether the T-PSQS is valid for use with multiparous women and with women undergoing cesarean section.

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