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Research Article

Psychometric Properties of Turkish Version of Pediatric Daytime Sleepiness Scale (PDSS-T)

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SUMMARY

Purpose: The aim of the research was to evaluate the psychometric properties of the Pediatric Daytime Sleepiness Scale-Turkish Version (PDSS-T).**Methods:** The researchers chose a study sample of 522 grade 5–11 students. Data were collected using a demographic data collection form and the PDSS-T.**Results:** Cronbach α for the scale was .79 and Kaiser-Meyer-Olkin coefficient was .78. Item-total correlations for the scale varied between .53 and .73 ($p < .001$). The indices of model fit were determined to be the root mean square error of approximation at .07, the goodness of fit index at .97, and the comparative fit index at .97.**Conclusions:** The study's results showed that PDSS-T is a valid and reliable instrument for detecting Turkish-speaking children's and adolescents' daytime sleepiness. PDSS-T is convenient for professionals to prevent and manage daytime sleepiness.Copyright © 2016, Korean Society of Nursing Science. Published by Elsevier. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

In addition to being in a state of reversible unconsciousness, sleep is a state of immobility during which the body rests and is also in an active renewal process that reprepares the whole body for life [1]. Sleep is a universal concept, and children pass 40.0% of the day in sleep [2]. Research conducted so far indicate that children and adolescents need to sleep more than 8 hours a day [3]. When night sleep drops below 8 hours, wakefulness deteriorates which contributes to poorer school performance. A short night's sleep affects negatively the developmental levels of children and adolescents, and reduces their quality of life. Despite the increasing need for sleep, daily sleep duration often shortens and the child may experience many problems [4]. Adolescents preparing for school often sleep late and wake up early. This pattern may lead to chronic sleep problems, which then results in daytime

sleepiness that may lead to learning and attention problems [2]. In the adolescent period, the adolescents spend more time at the computer and other devices. The excessive devices using gives rise to late sleep time, delay the circadian rhythm, suppresses melatonin levels, increases alertness and decrease sleep duration [5,6]. Insufficient sleep due to increasing academic activities and social activities and the tendency to sleep late and wake up early may affect the daytime sleepiness state of the adolescent period [7].

Wolfson and Carskadon [8] show that the students with low levels of achievement are relatively sleep deprived, in comparison to successful students. These students' bedtime is later, and the students have irregular sleep patterns. When Mercer et al [3] questioned the beliefs of children regarding their sleep sufficiency, the researchers reported that 46.0% of the children believed that homework caused daytime sleepiness while 54.0% of the sample stated that they felt sleepy all day. While there are many studies on daytime sleepiness in foreign countries [8–18], no study examining daytime sleepiness exists in Turkey. Most of the studies examining sleep relate to sleep factors and sleep hygiene [17–20]. Sleep hygiene is a variety of different practices that are necessary to have normal, quality nighttime sleep and full daytime alertness

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[21]. However, it is of paramount importance to define the level of daytime sleepiness that can affect both academic and cognitive functions. Nurses, especially school nurses have an important role in determining daytime sleepiness and related problems. Nurses can determine daytime sleepiness status more than other professionals do because they are constantly with children and observe their problems more closely. However, nurses need tools that can be used easily to determine and prevent daytime sleepiness [19,20]. Furthermore, there is no reliable and valid Turkish measurement tool that examines daytime sleepiness status of children and adolescents. Standard scales are needed to identify daytime sleepiness of children, to determine factors affecting it and to plan necessary interventions to eliminate these factors. Due to this deficiency in the field, this study was designed to test the reliability and validity of the Pediatric Daytime Sleepiness Scale (PDSS), which is a tool that measures daytime sleepiness status of children and adolescents.

Methods

Design

An explanatory and cross-sectional descriptive design was used in this study. The study was conducted for the purpose of testing psychometric properties of the Turkish version of PDSS (PDSS-T). The secondary aim of the study was to determine factors that affected pediatric daytime sleepiness. The research was carried out in secondary and high schools under the Ministry of National Education in a city in the western region of Turkey during the months of February and March 2014.

Setting and samples

In the instrument testing, experts recommend including 5–10 people for every item on the instrument. Additionally, at least five people per item are necessary to perform a factor analysis. Ten people per item are needed to achieve parametric sampling [22–25]. Taking studies such as one by Drake et al [9] as an example of this design, the sample size needed was at least 84 for Type II error to be at .010 and Type I error to be at .010. However, for factor analysis, a sample size of least 100 is required to discriminate relationships between the variables [9].

To test the reliability and validity of the PDSS that consists of 8 items, 10 children or adolescents were selected for each item. Thus, the study sample consisted of 80 children and adolescents according to our calculations. After considering the study of Drake et al [9], we calculated that the study sample should consist of 84 children and adolescents. The literature reported that a sample of up to 100 entities is poor, up to 200 entities fair, up to 300 entities good, up to 500 entities very good, and up to 1,000 entities excellent in factor analysis [22–27,31–32]. Professionals urged researchers to obtain samples of 500 or more observations whenever possible [22–32]. To be able to determine the relationships between the variables of the scale more clearly and generalize the results of the scale, all students in the selected schools were included in the study. The inclusion criteria of the study were that students were in grade 5–11, agreed to participate voluntarily, provided a signed consent form from the parents, and could read and understand the material they were given. The sample comprised 543 students originally, and 522 grade 5–11 students agreed to take part in the study. Only students whose parents gave their written consent were included in the study. The response rate was 96.1%.

Ethical consideration

This study was approved by the Institutional Review Board of the University (IRB approval no.: 1268-GOA-2013/47-19). Permission was also obtained from the Izmir Provincial Directorate for National Education to conduct the study. Written consent from parents and verbal consent from children were received to enable the children to participate in the study.

Instruments

In the study, the Questionnaire Form and the Turkish version of PDSS-T were used to collect data. The Questionnaire Form and PDSS-T were given in each class for the duration of a lesson. Before completing the scales, the researchers explained the forms. Students were asked not to write any information about their identities on the forms, so that their identity was confidential. Completed forms were collected by the researchers.

The Questionnaire Form, developed by the researchers, includes 18 questions about age, gender, grade, school, perceived academic achievement, smoking, sleep patterns and bedtime status. Early bedtime status was defined as sleep before 10 p.m.

The original PDSS was developed in 2003 by Drake et al as an 8-item scale for the purpose of evaluating daytime sleepiness in children and adolescents [9]. The items are scored on a 4-point Likert-type scale. The point distribution for the PDSS is 0–32. The highest score of PDSS indicated more daytime sleepiness. In the original study, the Cronbach α was .80. In this study, PDSS-T showed good internal consistency, with Cronbach α at .80 and .81 for the split-half samples [9].

Data collection/procedure

Translation of PDSS

Adaptation means adapting item by culture [22–25]. In this study, permission was received by e-mail from Christopher Drake to adapt the PDSS to Turkish and to use it. PDSS was translated into Turkish by three independent bilingual language experts. After it was translated into Turkish, the translated version of PDSS was reviewed by the research team. Then, the revised version was checked by a Turkish language expert. A different language expert back-translated PDSS-T [22–25].

Content validity of PDSS

Researchers recommend that at least three experts give their opinion to determine that the translation form is equivalent to the original form and calculate the content validity index (CVI) [22–25]. In this study, the four experts were given the original PDSS and PDSS-T together. They were asked to assess the convenience of the PDSS items on a scale of 1–4 (1 = *not appropriate at all*, 4 = *completely appropriate*). CVI was calculated by dividing the number of experts who had a rating of either 3 or 4 by the total number of experts [22–25]. Based on their responses, the scale level CVI (S-CVI) and item level CVI (I-CVI) were calculated. If the S-CVI and I-CVI were more than .80, then it was interpreted as indicative of a high content validity [22–25].

Reliability of PDSS

Cronbach α , split-half method, item-total correlation, floor and ceiling effects were used for reliability analysis. Experts specify that the acceptable and minimum value is .70 for Cronbach α , Spearman-Brown and Guttman split-half values. It is recommended that item-total correlation coefficient be greater than .20 or .25 for an item to be acceptable. Floor or ceiling effects are

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