Article Info

The association between sleep disturbances of children with anxiety disorders and those of their mothers

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A B S T R A C T

Objective: Previous research has demonstrated a link between childhood anxiety and sleep problems, but little is known about the link between these difficulties and parental sleep disturbances. The purpose of the current study was to explore the association between anxious children's sleep difficulties and those of their mothers.

Method: A total of 101 children aged 8–18 years and their mothers participated in this study. The clinical group included 66 children (mean age = 11.45 years, standard deviation = 2.79 years) diagnosed with anxiety disorders, and the control group included 35 age- and sex-matched normal healthy controls. Mothers completed questionnaires assessing their child’s anxiety and sleep, as well as their own sleep. Children completed questionnaires assessing anxiety, sleep, depression, and obsessive symptoms.

Results: Both children and mothers in the clinical group exhibited more sleep difficulties compared to controls. A regression analysis revealed that pre-sleep arousal negatively predicted children's sleep. Furthermore, children's anxiety level was associated with parental levels of sleep disturbances. This link was fully mediated by the children’s sleep disturbances score.

Conclusion: Mothers of children with anxiety disorders exhibit higher levels of sleep disturbances than controls. These difficulties are linked to children’s anxiety and sleep problems. When treating children with anxiety, it is therefore important to assess their overall sleep disturbances, as well as parental sleep difficulties, and when appropriate to add a specific sleep intervention component.

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1. Introduction

Anxiety disorders comprise one of the most common psychopathologies in childhood and adolescence. It is suggested that 18.6% of children and adolescents report having suffered from at least one type of anxiety disorder during their lives [1,2]. Previous studies demonstrated that the daily functioning of 8–12% of all children and adolescents is impaired due to severe anxiety [3]. For many children, anxiety disorders tend to persist and to continue through adolescence and adulthood if left untreated [4]. Furthermore, the anxiety disorders increase in frequency with age [1] and are the primary reason for referral of children to mental health services [5].

Sleep problems are also very prevalent phenomena from infancy to adolescence [6,7], and frequently co-occur with anxiety disorders [8–12]. It has been reported that 95% of parents of children with anxiety disorders report that their children suffer from concurrent sleep problems [13], and the majority (55%) report more than one sleep-related difficulty [14,15]. The most common sleep problems associated with anxiety are difficulty initiating and/or maintaining sleep, refusal to sleep independently, and nightmares [16]. In addition, the likelihood of developing sleep disturbances was found to be higher when anxiety symptoms were more severe [15,17], and were mostly associated with separation anxiety disorder (SAD) and...
generalized anxiety disorder (GAD) [13,14]. Moreover, anxiety disorders were found to co-occur very frequently with depressive disorder and with obsessive-compulsive disorder [1] [lewinsohn et al., 1997].

Recently, there has been an increased interest in the link between children's sleep problems, parental sleep and daily functioning [18]. Previous studies have suggested that the association begins as early as pregnancy, while the fetus is in the womb. During the prenatal period, the mother's sleep changes as part of a general change in hormonal pathways [19]. Both self-reported and objective measures have shown that, immediately after the birth of the infant, the sleep of both parents is impaired, as reflected in fewer hours of sleep and more frequent waking during the night [19]. This link is also prominent in school-aged children. Several studies have demonstrated a link between children's sleep problems and parental sleep difficulties in healthy populations. For example, parents' reports of their children's sleep problems were found to be related to the parents' reports of their own sleep problems [20,21]. Additionally, a survey on children's sleep suggested that 50% of parents wake up during the night in response to their child's awakening, at least once a week, thus losing important sleep time [22]. In another study, mothers of children with significant sleep problems were found to have lower sleep quality compared to mothers of children without sleep disturbances [20], and daytime sleepiness among parents was found to be significantly associated with their children's sleep problems, sleep duration and daytime sleepiness [23].

Several studies have also demonstrated a link between children's sleep difficulties and parental sleep among children with psychopathology. For example, a study from our group found that parental sleep of children with attention-deficit/hyperactivity disorder (ADHD) was associated with their children's sleep problems and the children's level of pre-sleep arousal [24]. In addition, sleep disturbances, especially at bedtime, are frequently reported by both parents and children with ADHD [25]. Moreover, more than two-thirds of parents of children with autism spectrum disorders reported that their own sleep was disrupted due to their child's sleep [26].

In another study, parents of children with autism reported poorer sleep quality and were objectively found to wake up earlier and to have a shorter sleep period compared to parents of normative children [27]. When parental sleep problems become chronic, significant difficulties in daily functioning can occur [28]. However, to the best of our knowledge, the sleep of parents of children with anxiety disorders has never been reported.

In light of the high rate of sleep disturbances in children and adolescents with anxiety disorders, and because there is evidence linking children and parental sleep problems, the main aim of the current study was to assess parental sleep of children with anxiety disorders.

In this study, we compared sleep patterns of children with and without anxiety disorders and the sleep patterns of their mothers, among school-aged children.

We hypothesized that the sleep of children with anxiety disorders and the sleep of their mothers would be significantly more disturbed than the sleep of controls. Moreover, we hypothesized that there would be an association between children's anxiety, children's sleep and parental sleep quality. If this association were to occur very frequently with depressive disorder and with obsessive-compulsive disorder [1] [lewinsohn et al., 1997], there would be an association between children's anxiety, their own sleep difficulties, their children's anxiety, and their children's sleep problems.

2. Method

2.1. Participants

A total of 104 children with anxiety disorders as well as age- and sex-matched controls, 8–18 years of age, and their mothers participated in this study. The clinical group consisted of 68 children with an anxiety disorder and their mothers, who received treatment at the Pediatric Anxiety Clinic at a tertiary child psychiatry unit at a large medical center at the center of Israel. Diagnoses were based on a joint interview of the child and the child's parents that was conducted by a senior psychologist and a senior psychiatrist based on DSM-IV criteria. The control group consisted of 36 healthy children and their mothers who responded to advertisements calling for volunteers to take part in the study or via the Internet. Mothers in both groups completed a demographic questionnaire, which included medical and family information. Exclusion criteria for both samples were major health or neurological disorders. In cases in which a clinical disorder or ongoing psychiatric/psychological treatment was reported by the mothers in the control group, the participant was excluded from the study.

2.2. Measures

2.2.1. Children's Sleep Habits Questionnaire

The current sleep behavior of children was measured by the Children's Sleep Habit Questionnaire (CSHQ) [29]. The CSHQ contains 33 items regarding the child's sleep during the past week. The CSHQ assesses bedtime resistance, sleep onset delay, sleep duration, sleep anxiety, night waking, parasomnias, sleep disordered breathing and daytime sleepiness. The items are rated on a three-point Likert scale (1 = rarely, 2 = sometimes, 3 = often), and are totaled to give a global CSHQ score, with higher scores indicating more disturbed sleep. A cutoff score of 41 has been recommended, with scores >41 indicating that a child is experiencing sleep problems. The questionnaire is widely used, and distinguishes between clinical and nonclinical populations [29]. In this study, the internal reliability (Cronbach's α) was 0.69.

2.2.2. Pittsburgh Sleep Quality Index

The quality of the mothers' sleep was measured by the Pittsburgh Sleep Quality Index (PSQI) [30]. The questionnaire contains 19 self-reports items about the general quality of the mothers' sleep, grouped into seven subscales including Sleep quality, Sleep onset latency, Sleep duration, Sleep efficiency, Sleep disturbances, Sleep medications and Day-time dysfunction. These items are rated on a four-point Likert scale (0 = undisturbed, to 3 = severe impairment). The scores are totaled, producing a global score for parental sleep quality. Higher scores indicate poorer sleep quality, and a score of five points or more indicate high probability of clinically impaired sleep. In this study, the internal reliability (Cronbach's α) was 0.7.

2.2.3. Screen for Child Anxiety Related Disorders

Children's anxiety symptoms were measured by the Screen for Child Anxiety Related Emotional Disorders (SCARED-R) [31]. The questionnaire contains 66 self-reported items, comprising seven subscales that assess the full spectrum of anxiety disorder symptoms in the DSM-IV. Symptoms are rated on a three-point Likert scale, according to the frequency with which they are experienced (0 = never, 1 = sometimes, 2 = often) and totaled to provide a global score. Higher scores indicate greater levels of child anxiety. In this study, the internal reliability (Cronbach's α) was 0.95.
2.2.4. Children’s Depression Inventory

Behavioral, physiological, social, emotional, and cognitive symptoms of depression were measured by the Children’s Depression Inventory (CDI) [32]. The questionnaire contains 27 self-reported items, rated on a three-point Likert scale from 0 to 2, with zero indicating the absence of depressive symptoms and two indicating a very depressed mood. Higher scores reflect more severe depression. In this study, the internal reliability (Cronbach’s α) was 0.83.

2.2.5. Obsessive Compulsive Inventory—Child Version

The presence of obsessive and compulsive symptoms was measured by the Obsessive Compulsive Inventory—Child Version (OCI-CV) [33]. This questionnaire contains 21 self-reported items rated on a three-point Likert scale (1 = never, 2 = sometimes, 3 = always). The items comprise six obsessive-compulsive disorder (OCD) subscales: Checking, Obsessing, Hoarding, Washing, Ordering, and Neutralizing. All the items are totaled to provide a global score, with higher scores indicating the presence of more severe OCD symptoms. In this study, the internal reliability (Cronbach’s α) was 0.87.

2.2.6. Pre-Sleep Arousal Survey for Children

Levels of stimulation before sleep were measured by the Pre-Sleep Arousal Survey for Children (PSAS-C) [34]. This questionnaire contains 16 self-reported items comprising both cognitive and somatic manifestations of arousal before falling asleep. The items are rated on a five-point Likert scale (1 = not at all, to 5 = extremely). A total score and two subscale scores are calculated, with higher scores indicating higher levels of pre-sleep arousal. In this study, the internal reliability (Cronbach’s α) was 0.88.

2.3. Procedures

Ethical approval for this study was granted from the Institutional Review Board of Sheba Medical Center, Ramat-Gan, and from Ruppin Academic Center. The questionnaires completed by the parents were the CSHQ, PSQI, and SCARED. The questionnaires completed by the children were the PSAS, OCI-CV, CDI, and SCARED. All questionnaires completed by the children have been found to be reliable and valid for children eight years and older [31,34–36].

2.4. Data analysis

Data analysis was conducted using SPSS version 22, and included the following: a comparison of clinical variables between the two groups using a series of independent t tests; a linear regression with the PSQI score as the dependent measure and CSHQ, SCARED, and PSAS scores, age, gender, and group as the dependent measures; a series of linear regressions and Sobel test, to test whether the link between SCARED score and PSAS score is mediated by CSHQ score (mediation model); and a linear regression with CSHQ score as the dependent measure and age, SCARED, and PSAS scores as the dependent measures.

3. Results

3.1. Sample demographics

Two children from the clinical group were excluded from the study due to epilepsy, and one child from the control group was excluded from the study due to psychopathology. A total of 66 children were included in the clinical group (38 boys and 28 girls), and 35 children were included in the control group (13 boys and 22 girls). The mean age ± standard deviation (SD) for all children was 11.86 ± 2.94 years (age range 7.5–18.0 years). In the clinical group, the distribution of the primary diagnosis was as follows: separation anxiety (18 children, 27.2%), social anxiety disorder (11 children, 16.7%), OCD (10 children, 15.2%), generalized anxiety disorder (eight children, 12.1%), anxiety not otherwise specified (eight children, 12.1%), specific phobia (five children, 7.9%), selective mutism (two children, 3%), panic disorder (two children, 3%) and adjustment disorder with anxiety (two children, 3%). Additionally, 22.7% of the children (N = 15) were diagnosed with more than one anxiety disorder. Maternal age (mean ± SD) for all children was 43.77 ± 6.44 years, and parental age (mean ± SD) for all children was 45.41 ± 7.08 years. For all children, the average number of school years completed (mean ± SD) was 15.42 ± 2.85 for mothers and 14.67 ± 2.99 for fathers.

The demographic characteristics of the control families did not differ significantly from those of the families in the clinical group (Table 1).

3.2. Sleep measures in parents of children with anxiety versus controls

A significant difference in PSQI was found between the groups. In comparison with controls, the parents of children with anxiety disorders had significantly higher total PSQI scores (p < 0.05) (Table 2).

3.3. Anxiety and sleep measures in children with anxiety versus controls

Significant differences in SCARED, OCI-CV, and CDI scores were found between the groups. In comparison with controls, children with anxiety disorders had significantly higher total SCARED, OCI-CV, and CDI scores (p < 0.001 for all variables) (Table 2). Furthermore, significant differences in CSHQ and PSAS scores were found between the groups. In comparison with controls, children with anxiety disorders had significantly higher total CSHQ and PSAS scores (p < 0.001 for CSHQ; p < 0.05 for PSAS) (Table 2).

Table 1

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Anxiety (N = 66)</th>
<th>Control (N = 35)</th>
<th>t/χ² Statistic</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean (SD)</td>
<td>11.48 (2.8)</td>
<td>12.57 (3.09)</td>
<td>−1.81(𝑡)</td>
<td>NS</td>
</tr>
<tr>
<td>Mother’s age, mean (SD)</td>
<td>43.09 (5.13)</td>
<td>45.03 (8.29)</td>
<td>−1.44(𝑡)</td>
<td>NS</td>
</tr>
<tr>
<td>Father’s age, mean (SD)</td>
<td>44.58 (5.84)</td>
<td>46.85 (8.70)</td>
<td>−1.51(𝑡)</td>
<td>NS</td>
</tr>
<tr>
<td>Mother’s years of education, mean (SD)</td>
<td>15.25 (2.89)</td>
<td>15.77 (2.76)</td>
<td>−0.86(𝑡)</td>
<td>NS</td>
</tr>
<tr>
<td>Father’s years of education, mean (SD)</td>
<td>14.3 (3.04)</td>
<td>15.30 (2.86)</td>
<td>−1.53(𝑡)</td>
<td>NS</td>
</tr>
<tr>
<td>Female, n (%)</td>
<td>28 (66)</td>
<td>22 (35)</td>
<td>3.82(χ²)</td>
<td>NS</td>
</tr>
<tr>
<td>Average income, n (%)</td>
<td>43 (66)</td>
<td>20 (35)</td>
<td>5.22(χ²)</td>
<td>NS</td>
</tr>
</tbody>
</table>

NS, not significant; SD, standard deviation.
*p < 0.05 was used as the significance level.
Table 2
Differences in SCARED_PARENT, SCARED_CHILD, CSHQ, PSQI, PSAS, OCI-CV, and CDI between groups (mean ± standard deviation).

<table>
<thead>
<tr>
<th></th>
<th>Clinical group (n = 66)</th>
<th>Control group (n = 35)</th>
<th>F score</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSQI</td>
<td>4.3 ± 1.94</td>
<td>3.46 ± 2.23</td>
<td>1.87*</td>
<td>81</td>
<td>0.03</td>
</tr>
<tr>
<td>SCARED_PARENT</td>
<td>111.95 ± 23.19</td>
<td>85.35 ± 15.99</td>
<td>5.93***</td>
<td>92</td>
<td>0.00</td>
</tr>
<tr>
<td>SCARED_CHILD</td>
<td>113.92 ± 21.97</td>
<td>97.25 ± 17.59</td>
<td>3.85***</td>
<td>96</td>
<td>0.00</td>
</tr>
<tr>
<td>CSHQ</td>
<td>49.37 ± 9.07</td>
<td>41.51 ± 5.84</td>
<td>4.68*</td>
<td>94</td>
<td>0.00</td>
</tr>
<tr>
<td>PSAS</td>
<td>37.81 ± 11.81</td>
<td>32.89 ± 11.15</td>
<td>1.99*</td>
<td>92</td>
<td>0.02</td>
</tr>
<tr>
<td>OCI-CV</td>
<td>33.26 ± 7.25</td>
<td>30.23 ± 6.22</td>
<td>2.06*</td>
<td>91</td>
<td>0.02</td>
</tr>
<tr>
<td>CDI</td>
<td>12.32 ± 7.98</td>
<td>5.91 ± 4.99</td>
<td>4.14***</td>
<td>92</td>
<td>0.00</td>
</tr>
</tbody>
</table>

CDI, Children Depression Inventory; CSHQ, Children’s Sleep Habits Questionnaire; df, degrees of freedom; OCI-CV, Obsessive Compulsive Inventory–Child Version; PSAS, Pre-Sleep Arousal Scale; PSQI, Pittsburgh Sleep Quality Index; SCARED, Screen for Child Anxiety Related Disorders.

*p < 0.05, **p < 0.01, ***p < 0.001.

3.4. Prediction of parental sleep

Table 3 shows the results of the linear regression analyses predicting parental sleep score in both clinical and control groups, whereas children’s age, gender, anxiety score, sleep habits score, pre-sleep stimulation score and group status were entered as predictors. The regression model was found to be significant ($F_{6,65} = 5.65, p < 0.001$), and the independent variables predicted 34% of the variance in parental sleep. Specifically, SCARED score and CSHQ score were found to significantly and negatively predict parental sleep ($β = 0.34, p < 0.05$, and $β = 0.37, p < 0.01$, respectively), such that higher levels of anxiety and sleep disturbances among children predicted more disturbances in the parents’ sleep. The age of the child was also found to be a significant predictor of parental sleep, such that higher age of the children predicted more disturbances in parental sleep ($β = 0.29, p < 0.01$). The other predictors (sex, PSAS score, and group status) were not significant.

To examine the hypothesis that children’s sleep (as measured by CSHQ score) mediates the association between children’s anxiety levels (as measured by SCARED score) and parental sleep (as measured by PSQI score), a mediation model was tested using a series of linear regression analyses. First, we tested whether SCARED score explained some of the variance of PSQI score. The regression path from SCARED score to PSQI score was significant ($F_{1,75} = 10.48, p < 0.01, β = 0.35$). Of the variation in the PSQI score, 35% was explained by SCARED score. Second, we tested whether SCARED score explained some of the variance of the CSHQ score. The regression analysis predicting the CSHQ score with the SCARED score was also significant ($F_{1,90} = 35.47, p < 0.001, β = 0.53$). Of the variation in the CSHQ score, 53% was explained by the SCARED score. Third, we tested whether CSHQ score explained some of the variance of the PSQI score. The regression analysis predicting the PSQI score from the CSHQ score was significant ($F_{1,78} = 11.01, p < 0.01, β = 0.35$). Of the variation in the PSQI score, 35% was explained by the CSHQ score. Fourth, we examined whether the model remained significant when CSHQ score were entered into the model as an additional predictor of PSQI score. When SCHQ score were entered into the regression, the link between SCARED score and PSQI score was no longer significant ($β = 0.16$, indicating full mediation (Fig. 1). Finally, the Sobel test for mediation was found to be significant (Sobel statistic = 2.53, $p < 0.05$).

3.5. Prediction of children’s sleep

Table 4 shows the results of the linear regression analyses predicting children’s sleep score in the clinical group, whereas children’s age, anxiety score, and pre-sleep stimulation score were entered as predictors. The regression model was found to be significant ($F_{4,47} = 4.52, p < 0.01$), with the independent variables predicting 22% of the variance in children’s sleep. Specifically, only children’s PSAS score was found to negatively predict CSHQ score ($β = 0.29, p < 0.05$), so that higher levels of child pre-sleep stimulation were associated with lower quality of sleep.

Table 3
Regression analyses predicting PSQI score from independent predictors: Age, gender, group, and SCARED, SCHQ, and PSAS scores.

<table>
<thead>
<tr>
<th>Predictors (n = 101)</th>
<th>B (SE)</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model ($R^2 = 0.34$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSHQ</td>
<td>0.103 (0.034)</td>
<td>0.365</td>
<td>2.995**</td>
<td>0.00</td>
</tr>
<tr>
<td>Age</td>
<td>0.203 (0.073)</td>
<td>0.292</td>
<td>2.795**</td>
<td>0.007</td>
</tr>
<tr>
<td>Sex</td>
<td>0.539 (0.441)</td>
<td>0.135</td>
<td>1.221</td>
<td>0.23</td>
</tr>
<tr>
<td>SCARED</td>
<td>0.032 (0.013)</td>
<td>0.342</td>
<td>2.489*</td>
<td>0.02</td>
</tr>
<tr>
<td>PSAS</td>
<td>-0.037 (0.019)</td>
<td>-0.224</td>
<td>-1.963</td>
<td>0.05</td>
</tr>
<tr>
<td>Group</td>
<td>0.155 (0.511)</td>
<td>0.039</td>
<td>0.304</td>
<td>0.76</td>
</tr>
</tbody>
</table>

CSHQ, Children’s Sleep Habits Questionnaire; PSAS, Pre-Sleep Arousal Scale; SCARED, Screen for Child Anxiety Related Disorders; SE, standard error.

*p < 0.05; **p < 0.01.

Table 4
Regression analyses predicting CSHQ score from independent predictors: Age, SCARED score, and PSAS score.

<table>
<thead>
<tr>
<th>Predictors (N = 66)</th>
<th>B (SE)</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model ($R^2 = 0.22$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.29 (0.41)</td>
<td>-0.095</td>
<td>-0.095</td>
<td>0.48</td>
</tr>
<tr>
<td>SCARED</td>
<td>0.083 (-0.051)</td>
<td>0.228</td>
<td>1.62</td>
<td>0.11</td>
</tr>
<tr>
<td>PSAS</td>
<td>0.199 (0.096)</td>
<td>0.293</td>
<td>2.06*</td>
<td>0.04</td>
</tr>
</tbody>
</table>

CSHQ, Children’s Sleep Habits Questionnaire; PSAS, Pre-Sleep Arousal Scale; SCARED, Screen for Child Anxiety Related Disorders; SE, standard error.

*p < 0.05.
4. Discussion

The aim of the current study was to explore the association between parental and child sleep disturbances, among children suffering from anxiety disorders. To the best of our knowledge, this is the first research that has focused on this issue.

The most important and novel finding was that parental sleep of children with anxiety disorders was impaired compared to parental sleep of children without anxiety. This adds to the scarce but growing evidence highlighting the negative link between children’s psychopathology and parental sleep [20,24]. Additionally, in line with the previous findings, children in the clinical group exhibited more sleep difficulties compared to controls, as reflected in higher PSAS and CSHQ scores [11].

In children with anxiety disorders, anxiety and stress levels rise at night, especially around bedtime [37], and many of them therefore exhibit various sleep-related difficulties [38]. In order to reduce their children’s stress and anxiety and return to sleep quickly, many parents use immediate solutions such as co-sleeping (sleeping in the same bed/room for the whole night or part of it) [39]. However, these solutions are associated with more disrupted sleep in children [11]. These sleep difficulties in turn require more parental intervention, which leads to a disruption in parental sleep. The disrupted parental sleep may negatively affect their attempts to put their children back to sleep. In a previous publication, we suggested using both objective and subjective measures of sleep, since there are based on subjective reports. Previous researchers have suggested using both objective and subjective measures of sleep, since findings tend to differ depending on the instrument being used for assessing sleep [41]. Second, in our research, parental psychopathology was not assessed. It can be assumed that this factor may play a role in the association between children and parental sleep. Previous findings demonstrated a link between psychopathology and sleep in adult population [42–44], and also linked parental psychopathology and children’s sleep [45,46]. Future studies should incorporate various measures to assess parental psychopathology. Finally, parental sleep quality was evaluated only by the mothers’ reports. Future studies should assess fathers’ reports of their sleep as well, to obtain a wider and more accurate picture of the relation between parents’ and children’s sleep.

5. Conclusion

In this study, children with anxiety disorders exhibited higher levels of sleep and emotional difficulties than normative children, and the sleep of their parents was found to be more impaired. According to a mediation model that was found, the link between children’s anxiety and parents’ sleep difficulties was mediated by the sleep difficulties of their child. Further research is needed to better characterize and understand the impact of sleep problems on children with anxiety disorders and their parents. Given the significant differences in sleep quality between anxious and normative children and their parents, a comprehensive evaluation including specific sleep assessment is recommended as part of the initial clinical evaluation. In cases in which sleep problems are identified, a relevant sleep intervention should be added to the treatment process.

Conflicts of interest

The authors have no conflict of interest to report.

The ICMJE Uniform Disclosure Form for Potential Conflicts of Interest associated with this article can be viewed by clicking on the following link: https://doi.org/10.1016/j.sleep.2017.10.009

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