



Original Article

Sleep of preschool children with night-time fears

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ARTICLE INFO

Article history:

Received 15 November 2010
 Received in revised form 7 March 2011
 Accepted 13 March 2011
 Available online 5 October 2011

Keywords:

Night-time fears
 Sleep
 Actigraphy
 Preschool
 Child
 Anxiety

ABSTRACT

Background: Night-time fears are very common in preschool and early school years. However, to date, the links between night-time fears and sleep have not been assessed systematically. The aim of this study was to evaluate natural sleep patterns in children with night-time fears, and to assess the association between parental fear-related strategies and children's sleep disruptions.

Methods: Sleep was assessed in a sample of 109 preschool children (64 boys and 45 girls) aged 4–6 years suffering from significant night-time fears, and in 30 healthy controls using actigraphy and parental reports.

Results: Controls slept significantly better than the children with night-time fears. The disrupted sleep patterns of the children with night-time fears were reflected in a higher number of actigraphic night wakings, shorter periods of continuous sleep, shorter true sleep time, and a lower percentage of actual sleep time. Similar findings were manifested in sleep measures reported by the parents. Parental fear-management strategies were found to be linked to impaired actigraphic sleep measurements.

Conclusions: Children with night-time fears are at risk for developing poor sleep quality, which may further compromise their psychological well-being.

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1. Introduction

Transient and mild night-time fears are very common and are recognized as normal phenomena in typical child development [1–3]. Muris et al. (2001) found that 73.3% of the children in their study aged 4–12 years reported night-time fears, but only 34.4% of their parents reported such fears [3]. Interestingly, Muris et al. found distinct developmental patterns according to the children and their parents. According to the children's reports, the prevalence of night-time fears increased from 58.8% in 4- to 6-year-old children, to 84.7% in 7- to 9-year-old children, and to 79.6% among 10- to 12-year-old children. A gradual decrease with age characterized parental reports, with 44.3% reporting fears in 4 to 6-year-old children, 32.1% in 7- to 9-year-old children, and 23.9% in 10 to 12-year-old children.

Night time and going to sleep pose a serious challenge for many young children [1–5], and persistent anxiety symptoms and severe night-time fears that interfere with daily functioning are common [1,5,6]. Among other difficulties, sleep problems are reported to be an integral part of the clinical picture in children with night-time fears as they tend to present difficulty going to sleep, falling asleep, frequent night wakings, and difficulty resuming sleep [1,5–7].

Surprisingly, there are no studies directly linking night-time fears with objective findings on sleep disruptions in young children. However, in a longitudinal study on bed-sharing and sleep problems among Swiss children in the first 10 years of life, Jenni et al. found a peak in prevalence of night wakings (54%) and bed-sharing (38%) phenomena at four years of age [8]. The authors speculated that these findings emanated from cognitive development and changes in separation–attachment processes, leading to night-time fears at this specific age and the associated sleep disruptions. In another study, a similar peak in night wakings in this age group was found in comparison with younger and older children using objective measures of sleep [9].

It is important to emphasize that night-time fears do not constitute a formal diagnostic entity. The phenomenology of night-time fears is likely to overlap with the phenomenology of formal diagnoses such as anxiety disorders and behavioural insomnia. For instance, in a study of normal school children, Muris et al. [3] found that night-time fears were associated with a diagnosis of at least one anxiety disorder in more than 10% of subjects. Night-time fears can play a major role in behavioural insomnia. However, behavioural insomnia can result from other reasons such as bedtime resistance and limit-setting problems. The focus of the present study was on the phenomenology of night-time fears rather than specific diagnoses.

Parental presence near the child's bed or allowing the child to fall asleep or sleep throughout the night with the parents in the parents' bed is a very common parental strategy for dealing with

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night-time fears, and can produce positive outcomes in many cases [10,11]. However, it can also serve as a reward for the child that perpetuates the problem, or creates a new problem for parents who are not interested in a long-term cosleeping solution [5,12]. Furthermore, research has shown that infants who rely on their parents during the settling process are likely to have more night-waking problems [8,13–17]. In addition, it has been argued that excessive efforts of parents to calm their children and help them fall asleep may hamper the development of their self-soothing skills and can increase fears, thus the child remains dependent on parental help following night waking [8,13–17].

Given the growing interest in night-time fears in preschool children and the assumed links between night-time fears and sleep disruptions that have not, to date, been assessed systematically, this study aimed to evaluate sleep patterns in preschool children with night-time fears, and to assess the link between parental fear-management strategies and sleep disruptions. Previous studies on sleep in children with night-time fears have been based on subjective reports, which have serious limitations [18]. The present study is, to the authors' knowledge, the first actigraphy study to compare naturalistic sleep patterns in children with night-time fears and controls.

It was hypothesized that the sleep of children with night-time fears would be significantly more disrupted than the sleep of control children, and that parental presence near the child during the night would be associated with more disrupted sleep in children suffering from night-time fears.

2. Methods

2.1. Participants

The study was approved by the departmental ethics committee and the Chief Scientist of the Israeli Ministry of Education. All parents signed informed consent forms.

The study included clinical and control samples. The clinical group consisted of 109 preschool children (64 boys and 45 girls aged 4–6 years, mean age 58.91 [standard deviation (SD) 8.32] months) with night-time fears. Children were recruited via advertisements (offering a service for children with night-time fears) and by screening children in kindergartens. Inclusion criteria for this group were: (a) night-time fears for at least two months; (b) the problem had a significant adverse impact on the child and family; and (c) the problem required parental intervention on at least two nights per week in order to comfort the child. The control group consisted of 30 healthy children from the same age group, recruited by similar methods, who did not meet the criteria for inclusion in the clinical group [16 boys and 14 girls, mean age 58.93 (SD 7.62) months]. Exclusion criteria for both samples were: (a) major health or neurological development problems; (b) concurrent psychiatric treatment; and (c) concurrent psychotherapy or similar interventions. The presence of night-time fears was solely determined by parental reports during the screening and intake interviews.

2.2. Measures

2.2.1. Actigraphy

Actigraphy is based on a small device which resembles a wrist-watch that can be worn by a child for a substantial period of time and monitor sleep–wake patterns in that child's regular sleep environment [19–21]. The parents were instructed to attach an actigraph (Mini Motionlogger, Ambulatory Monitoring, Inc., Ardsley, NY, USA) to their child's non-dominant wrist during the evening before bedtime, and to remove it in the morning after rise time,

for a period of one week. The actigraph collected data in 1-min epochs. Sleep measures were derived from the raw data using the Actigraphic Scoring Analysis (ASA) program for an IBM-compatible personal computer [22]. These sleep measures have been validated against polysomnography with agreement rates for minute-by-minute sleep–wake identification above 90% in children and adults [20,22]. Validation against polysomnography exists for children younger and older than those in the study group; as the same algorithms have been found to be valid for these younger and older children, it was assumed that they would be appropriate for children aged 4–6 years. Furthermore, these measures have been validated against parental reports in this specific age range [9].

Actigraphic measures included: (1) sleep period (min) (total sleep duration from sleep onset to morning rise time); (2) true sleep time (sleep time excluding periods of wakefulness after sleep onset); (3) number of night wakings (lasting at least 5 min); (4) longest sleep period (longest period of continuous sleep without any arousal); and (5) sleep percentage (percentage of actual sleep time from total sleep period excluding wake time after sleep onset).

2.2.2. Sleep diary

In addition to actigraphy, a sleep diary was completed by parents for the same 1-week period. The evening items assessed sleep latency and the level of sleepiness prior to bedtime. The morning items assessed the global number of night wakings and number of night wakings due to fears, level of subjective sleep quality, and total time awake during the night [23].

2.2.3. Child Behavior Checklist

The Child Behavior Checklist (CBCL) (version for 1.5–6 year olds) was used to assess behaviour problems as perceived by parents [24]. The CBCL is widely used for the assessment of behaviour problems in children with well-established psychometric properties. The CBCL has been translated into Hebrew and validated in Israel [25].

2.2.4. Brief Child Sleep Questionnaire

The Brief Child Sleep Questionnaire (BCSQ) provides information on children's sleep habits and problems. The BCSQ items were derived from the Brief Infant Sleep Questionnaire (BISQ) [23] and the Sleep Habits Questionnaire (SHQ) [26]. The BISQ was developed and validated as a brief infant sleep screening tool for clinical and research purposes [23]. Measures of internal consistency (Cronbach's alpha) for the SHQ scales range between 0.72 and 0.82 [26]. When completing the BCSQ, the parents were instructed to refer to their child's sleep over the past week. The items assessed sleep latency, number of night wakings, total time awake during the night, total sleep time during the night, movement during sleep, and sleep problems rating.

2.2.5. Night-time fears interview

A structured interview was held with parents to gain information on their child's night-time fears. The derived information included the coping behaviours adopted by parents and children to reduce night-time fears [3,27].

2.2.6. Family Background Information Questionnaire

The Family Background Information Questionnaire (FBIQ) includes 25 questions covering demographic and developmental data. The FBIQ has been established in previous studies in children [9,20,26,28].

2.3. Data analysis

Analysis of covariance was used to compare the actigraphic, sleep diary, and sleep questionnaire measures between the groups. The independent variable was group (children with night-time fears vs controls). The total CBCL score was entered as a covariate to control for other behaviour problems that may account for group differences in sleep patterns. Gender was also entered as a covariate in order to control for any potential gender effects.

Due to unequal group sizes, differences in variance between the groups were tested for each variable. Significant differences in variance were found between the groups for a few measures. In these cases, the group mean differences were analysed under the assumption of unequal variances using the Student's *t*-test. This verified the statistical significance of all reported differences.

3. Results

Comparison of the demographic variables revealed no differences between the groups (see Table 1). No significant differences were found between the groups for any of the demographic variables. In the control group, low levels of sporadic night-time fears

Table 1
Sample characteristics.

	Children with night-time fears	Controls
Child's age (months)	58.9 ± 8.3	59.0 ± 7.6
Child's gender (<i>n</i> boys/ <i>n</i> girls)	64/45	16/14
Mother's age (years)	36.0 ± 4.3	35.1 ± 3.9
Father's age (years)	37.9 ± 4.7	36.0 ± 5.1
Mother's education (years)	15.6 ± 2.3	16.3 ± 2.0
Father's education (years)	15.2 ± 2.6	15.5 ± 2.5
Mother's work load (h/week)	31.9 ± 15.0	27.0 ± 15.3
Father's work load (h/week)	47.1 ± 12.4	45.96 ± 18.7
Number of children in family	2.8 ± 4.7	2.7 ± 0.9
Order of child	1.6 ± 0.8	1.7 ± 1.0

Data presented as mean ± standard deviation.

No significant differences were found between the groups for any of these variables.

Table 2
Comparison of actigraphic and reported sleep measures between children with severe night-time fears and controls (controlled for total Child Behavior Checklist score and gender).

	Children with night-time fears	Controls	<i>F</i>
<i>Actigraphic measures</i>			
Sleep period (min)	568.1 ± 34.0	579.6 ± 51.6	n.s.
True sleep time (min)	508.01 ± 38.1	535.5 ± 45.3	5.8*
No. of night wakings	2.8 ± 1.2	2.0 ± 1.0	8.3**
Longest sleep period (min)	164.5 ± 49.9	188.5 ± 48.9	4.1*
Sleep percentage	89.5 ± 4.9	92.6 ± 3.7	6.7*
<i>Sleep diary measures</i>			
Night wakings (<i>n</i>)	1.7 ± 1.0	0.7 ± 0.5	15.9***
Fear-related night waking (<i>n</i>)	0.8 ± 1.2	0 ± 0	11.8**
Sleep latency ^a	2.3 ± 0.8	2.2 ± 0.7	n.s.
Sleep quality ^b	2.0 ± 0.6	1.5 ± 0.6	5.7*
Wake after sleep onset (min)	11.4 ± 15.5	4.0 ± 6.6	n.s.
<i>Brief Child Sleep Questionnaire measures</i>			
Total sleep time (min)	573.4 ± 74.7	608.8 ± 45.6	n.s.
Sleep latency (min)	31.5 ± 25.3	19.8 ± 11.5	3.9*
No. of night wakings	2.6 ± 1.9	0.7 (0.7)	23.1***
Wake after sleep onset (min)	22.4 ± 30.9	2.85 ± 4.6	8.2**
Sleep problems rating	6.6 ± 1.8	2.5 ± 0.9	122.7***

Data presented as mean ± standard deviation.

^a 0 = less than 5 min; 1 = 5–14 min; 2 = 15–30 min; 3 = more than 30 min.

^b 1 = very good; 2 = good; 3 = not so good; 4 = bad.

* *P* < 0.05.

** *P* < 0.01.

*** *P* < 0.0001.

were reported in nine children. Three children occasionally slept with their parents.

Significant differences in CBCL scores were found between the groups. In comparison with the controls, children with night-time fears had significantly higher total CBCL scores (mean for night-time fears group 40.6 [SD 27.9] vs. mean for control group 22.2 [SD 14.6]; *P* < 0.0001). These differences existed for both externalizing problems (mean for night-time fears group 12.8 [SD 8.8] vs. mean for control group 8.1 [SD 6.1]; *P* < 0.001) and internalizing problems (mean for night-time fears group 13.8 [SD 10.3] vs. mean for control group 5.9 [SD 4.1]; *P* < 0.0001).

Due to the significant differences in global behaviour problems between the groups, total CBCL score was used as a covariate in the analyses to control for the contribution of broader psychopathology to the variability in sleep measures. Significant differences in sleep measures derived from actigraphy, sleep diaries, and sleep questionnaires were found between the groups (see Table 2). Specifically, actigraphic sleep measures revealed that, in comparison with controls, children with night-time fears had shorter periods of continuous sleep, a higher number of night wakings, shorter true sleep time, and a lower percentage of actual sleep time (i.e., sleep efficiency). In addition, sleep diary measures indicated that, in comparison with controls, children with night-time fears generally woke up more often due to night-time fears and had poorer sleep quality. Finally, BCSQ measures indicated that, in comparison with controls, children with night-time fears woke up more often, spent more time awake during the night, had a higher rating for sleep problems, and had longer sleep latency.

A new variable was composed for children with night-time fears in order to assess the relationship between parental night-time fear-management strategies (e.g., cosleeping vs. limited presence near their child) and their child's sleep. Children were divided into two groups: cosleeping (i.e., children who, upon waking at night, fell asleep again in their parents' room and stayed there either throughout the night or for a limited time) and limited presence (i.e., children who, upon waking at night, fell asleep again with limited parental presence near their own bed).

An analysis of variance was performed (controlling for gender) to test the influence of the parental fear-management strategy on the sleep quality of children with night-time fears. Significant

Table 3

Comparison of actigraphic measures of children with severe night-time fears according to parental fear-management strategy group (controlled for gender).

	Cosleeping <i>n</i> = 85	Limited presence <i>n</i> = 19	<i>F</i>
Sleep period (min)	568.5 ± 31.9	566.3 ± 43.2	n.s
True sleep time (min)	504.7 ± 37.6	523.0 ± 37.7	n.s
No. of night wakings	3.0 ± 1.3	2.1 ± 0.8	8.4**
Sleep percentage	88.9 ± 5.0	92.5 ± 2.2	9.0**

Data presented as mean ± standard deviation.

** *P* < 0.01.

Table 4

Coping methods reported by parents when children wake during the night.

Coping method (<i>n</i> = 109)	No. of children (%)
Sleep in parents' room	67 (61.5%)
Temporary stay in parents' room	53 (48.6%)
Temporary parental presence in child's room	45 (41.3%)
Parents sleep in child's room	18 (16.5%)
Use of other object	6 (5.5%)
Turn on light	4 (3.7%)
Use of a doll	0

differences in the sleep measures derived from actigraphy were found between these two fear-management groups (see Table 3). Specifically, actigraphic sleep measures indicated that, in comparison with the limited presence group, children in the cosleeping group had a higher number of night wakings and a lower percentage of actual sleep time. Table 4 gives a detailed description of specific fear-management strategies.

4. Discussion

To the authors' knowledge, this is the first study on sleep patterns in children with night-time fears in their natural sleep environment using both objective and reported measures.

The findings demonstrate moderately compromised sleep patterns in children with night-time fears. In comparison with controls, children with night-time fears had less sleep and sleep of poorer quality as demonstrated by actigraphic measures (more night wakings, shorter periods of continuous sleep, shorter true sleep time, and a lower percentage of actual sleep time) and reported measures (more night wakings, poorer reported sleep quality, increased time awake during the night, and a higher rating of sleep problems). It is important to emphasize that these moderate differences in sleep patterns were found while controlling for broader behaviour problems or psychopathology. Therefore, they provide significant support to the reported links between night-time fears/anxiety and sleep problems [1,5–7,29,30].

These results demonstrating links between night-time fears and poor sleep should be considered in light of the high prevalence of both night-time fears [1–3,6] and sleep problems in children [9,26,31–33]. Furthermore, both poor sleep and night-time fears have been identified as risk factors for child development. Poor and insufficient sleep have been associated with behaviour problems and psychopathology [34–38], as well as with compromised neurobehavioural, cognitive, and academic performance [34,39,40]. However, it should be emphasized that studies on these links in preschool children are scarce. When childhood fears and anxiety are considered, the evidence suggests that these problems, if untreated, may be persistent, may have adverse effects on child development, and can predict anxiety and psychopathology in ado-

lescence and adulthood [41–45]. The combination of persistent childhood fears and sleep problems is likely to pose a significant developmental challenge that should alarm parents and clinicians.

Furthermore, this study found that the parental fear-management strategy of cosleeping is associated with poorer sleep quality compared with the limited presence strategy. This difference is consistent with previous findings that cosleeping is associated with poorer sleep quality in younger children and infants [15,16,46–49]. One possible interpretation is that cosleeping in the parents' room or bed is a rewarding experience that increases sleep fragmentation. Although allowing the child to sleep next to the parents in response to night-time fears may be effective in soothing children's fears in many cases [10], it could also serve as a strong reward for children that perpetuates the problem or creates a new problem for parents who are not interested in a long-term cosleeping solution [12]. According to this interpretation, insisting on helping children to resume their sleep in their own bed with minimal parental presence after fearful arousals facilitates better sleep. This is often the clinical recommendation under such circumstances [5,50].

An alternative interpretation is that parents of children with more fragmented sleep are more likely to choose the cosleeping strategy because of their own fatigue from repeatedly going to the child's room during the night. Unfortunately, the correlative nature of this finding precludes conclusions regarding the validity or superiority of each of these interpretations, and they can both play a role in the dynamic links between children's sleep and parental responses. Future longitudinal studies can potentially untangle the underlying causal explanation for these links.

It is important to emphasize that parental proximity (in the form of cosleeping in the parents' room or parental presence in the child's room) appears to attenuate night-time fears and serves as the main parental fear-management strategy in this age group. If parents refrain from providing their proximity, sleep could be compromised to a greater extent. Future studies should further explore the impact of spontaneous parental fear-management strategies, as well as clinical interventions, for night-time fears on sleep. Furthermore, cosleeping may have some effects on actigraphic recordings, and these effects should be assessed and controlled for in future studies.

This study focused on the phenomenology of night-time fears which have some overlap with anxiety disorders. This study did not evaluate anxiety disorders using a standard diagnostic system. However, the confounding effects of other behaviour problems were controlled for using the CBCL score. The links between night-time fears, anxiety disorders, behavioural insomnia, and sleep should be further explored, with more emphasis on comorbidity and phenomenological overlap.

5. Conclusions

From a clinical perspective, it appears that children with significant night-time fears have less sleep and more disturbed sleep compared with controls. Therefore, sleep disruptions and insufficient sleep should be considered in the clinical evaluation of these children. Furthermore, the potential adverse consequences of insufficient and poor sleep should also be considered and addressed clinically.

6. Funding sources

The research was supported by the Israel Science Foundation (Grant # 1047/08).

Conflict of Interest

The ICMJE Uniform Disclosure Form for Potential Conflict of interest associated with this article can be viewed by clicking on the following link: doi:10.1016/j.sleep.2011.03.022.

Acknowledgements

The authors wish to thank Ornit Arbel for coordinating and managing the study, and the participating families.

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