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Nighttime fears of preschool children: A potential disposition marker for anxiety?

Jonathan Kushnir[a,*], Doron Gothelf[a,b], Avi Sadeh[c]

[a]*The Child Psychiatry Unit, Edmond and Lily Safra Children's Hospital, Sheba Medical Center, Tel Hashomer, Ramat Gan, Israel*
[b]*Sackler Faculty of Medicine, Tel Aviv University, Israel*
[c]*The School of Psychological Sciences, Tel-Aviv University, Israel*

Abstract

Objective: To examine if children who suffer from significant Nighttime Fears (NF) experience higher degree of general fears and behavioral problems and to explore whether effortful control mediates NF association with internalizing problems.
Methods: One-hundred and nine preschool children (64 boys) between the ages 4 and 6 years suffering from significant NF and 30 healthy children (16 boys) were evaluated using parental reports of behavioral problems [Child Behavior Checklist (CBCL)], parental and child report of fears [Fear Survey Revised for Parents (FSS-PC), Koala Fear Questionnaire (KFQ)], and a measure of effortful control derived from the Child Behavior Questionnaire (CBQ).
Results: Children with severe NF also suffer from an increased level of a wide variety of fears other than NF, and exhibit more behavioral problems than controls both on parental and children's measures of general fears, and main CBCL scale scores (Internalizing, Externalizing, Total score). Additionally, children with NF had lower abilities of effortful control (as manifested in CBQ attention and inhibitory control scales). Attention control mediated NF association to internalizing problems scale.
Conclusions: NF may serve as a marker for anxiety vulnerability, and this vulnerability might be mediated by abnormal attentional control. Our finding also highlights the need for a more comprehensive assessment of behavioral problems, fears and anxiety phenomena among children referred with NF.

1. Introduction

Temperamental vulnerabilities play an important role in the development of anxiety disorders [1]. For example, previous studies have demonstrated that some children present from early age temperamental bias that predisposes them to be highly reactive to unfamiliar stimulation as infants and to be fearful of or avoidant to unfamiliar events and people as young children [2,3]. By the time they reach adolescence, about one-third of this group of children exhibit signs of serious social anxiety manifestations [2,3]. These findings suggest that temperamental factors from a very young age render some children especially susceptible to develop clinical symptoms of fear and anxiety [1,3–6]. Although early anxiety manifestations may remit over time, the vast majority of children and adolescents who develop anxiety symptoms will suffer from the same condition or other mental disorders over the further course of life [1].

Emotional regulatory skills may have a key role in the development of fear and anxiety Symptoms [7]. In children, attentional control is considered a component of self-regulatory processes that fall under the definition *Effortful control (EC)*. EC is considered a temperamental factor that has been defined as "the ability to inhibit a dominant response to perform a subdominant response" [7–10]. EC is generally thought to include two main components: inhibitory control, which refers to the ability to inhibit one's behavior when necessary, and attentional control, which is defined as the ability to focus and shift attention when needed [11]. EC competencies emerge during the second year of life [12]. At this age individual differences in EC can already be seen, and the capacity to self-regulate attention and behavior continues to develop throughout childhood [13–17].

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* Corresponding author. The Child Psychiatry Unit, Edmond and Lily Safra Children's Hospital, Sheba Medical Center, Tel Hashomer, Ramat Gan, Israel. Tel.: +972 52 6160044; fax: +972 39305843.
E-mail address: yonikushnir@gmail.com (J. Kushnir).

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Accumulating evidence suggests that lower levels of EC are related to higher levels of emotional and behavioral problems in children [8,9,18–24]. It has been suggested that EC and, in particular, attentional control play an important role in the pathogenesis of childhood anxiety disorders [25,26] through the influence on attentional biases to threat-evoking stimuli [21,27]. When children become anxious and aroused in the face of threat, high levels of EC may function as a buffer through the employment of self-regulative processes in the form of attention regulation and other flexible coping behaviors. However, when EC is low, the child is less capable of such self-regulation, and prone to develop high anxiety levels [8].

Mild and time-limited nighttime fears (NF) are very prevalent in normal development, and most children overcome or outgrow them [28,29]. However, nighttime and going to sleep pose a serious challenge for many young children [28,30,31] and persistent anxiety symptoms and severe NF that interfere with daily functioning are common [28,31,32].

In the context of NF, when a child is coping with a specific fear-related thought or image (e.g., being alone at night), a high level of EC would enable him or her to disengage from this specific stimulus and focus on an alternative one (attentional control). It could also enable the child to inhibit (inhibitory control) a prepotent response (e.g., seeking parental help) and using alternative modes of coping (e.g., playing with a favorite toy).

It has been demonstrated that childhood fears frequently occur in the context of other anxiety disorders[33]. Although NF do not constitute a formal diagnostic entity their phenomenology is likely to manifest in other diagnoses such as anxiety disorders. For instance, in a study of normal school children, Muris et al. (2001) found that NF were associated with a diagnosis of at least one anxiety disorder in more than 10% of subjects [30].

Considering the high prevalence of NF in childhood, its potential adverse impact, and its link to other anxiety phenomena, the aim of the study was to examine if children who suffer from significant NF also experience higher degree of general fears and behavioral problems. Considering the role of EC in regulating emotion and its potential link to childhood fears and anxiety disorders another aim was to explore the role of EC as a mediator between NF and an overall tendency for internalizing problems. It was hypothesized that children with NF would exhibit higher degree of general fears and that EC, particularly attentional control, would significantly mediate the link between NF and internalizing problems.

2. Methods

2.1. Subjects

139 children from clinical and control samples participated in the study. The clinical group of children with severe NF consisted of 109 preschool children (64 boys and 45 girls between the ages 4 and 6 years, mean age = 58.91 ± 8.32 months). 30 healthy children from the same age group, not meeting criteria for nighttime fears were included in the control group (16 boys and 14 girls, mean age = 58.93 ± 7.62 months). Comparison of the demographic variables revealed no group differences on any of the variables (child's gender, age, birth order and parental age, education, work load, and the number of children in the family) [34].

2.2. Measures

Fear Survey Revised for Parents (FSS-PC) — The FSS-PC is a revised version of the FSSC-R [35,36] which includes 52 items [35–39]. In the design of the FSS-PC items were selected and other items were added that seemed more appropriate for a sample of local preschool Israeli children (e.g., fear of terror attacks, fear of war) [35,36]. Parents were asked to rate their children's fear level, on a 1–4 scale (1 = not scary at all, 4 = very scary), on items such as ghosts, snakes, and getting lost from parents. Adding the scores for all responses across the 52 items yields the total fear score reflecting a global index of fear level. The internal reliability of the FSS-PC, based on Cronbach's alpha, for the clinical group and control group was 0.77 and 0.86 respectively.

Koala Fear Questionnaire (KFQ)[40] — The KFQ was used to directly assess children's fears. It consists of 31 picture illustrated stimuli and situations that can potentially elicit fear. KFQ stimuli and situations were derived from the top self-reported intense fears among children aged 4–12 [41,42] and from items constructing the Fear Survey Schedule for Children [37]. Children rated their level of fear from each stimulus or situation on a visual scale depicting Koala bears that express three levels of fear. Previous research has demonstrated that the KFQ is reliable in terms of internal consistency (as in the 0.80–0.90 range), test–retest stability (r was 0.84), and possesses adequate validity as evidenced by its positive correlations with alternative measures of childhood fear and anxiety [40].

Child Behavior Questionnaire (CBQ) — To measure the construct of effortful control, the Child Behavior Questionnaire (CBQ) was used [43]. The CBQ is a widely used temperament assessment tool intended for early to middle childhood (3–7 years). Temperament dimensions for the CBQ scales have been developed from dimensions studied in both adults and infants. The CBQ assesses three temperamental factors: Negative Affectivity, Surgency Extraversion, and Effortful Control, constructed of 15 scales [43]. The questionnaire consists of 195 items rated by parents on an eight-point scale. Internal consistency estimates of the CBQ scales have been reported in a number of sources, presenting mean levels Cronbach's alpha coefficients of 0.77 across all 15 scales [43,44]. Two scales of the CBQ were used in this study: attentional control and inhibitory control.

The Child Behavior Checklist (CBCL) — The CBCL was used to assess behavior problems as perceived by parents

[45]. The CBCL is a widely used tool for assessing behavior problems in children, with well-established psychometric properties. The CBCL has been translated to Hebrew and validated in Israel [46].

Family Background Information Questionnaire — This questionnaire includes 25 questions covering demographic and developmental data. This questionnaire has been established in previous studies in children [47–50].

2.3. Procedures

Children were recruited by screening in kindergartens and by advertisements (offering a service for children with NF). Inclusion criteria for the clinical group were: (a) The NF problem had to exist for at least two months; (b) the problem exerted significant adverse impact on the child and family; (c) the problem required parental intervention on at least two nights per week in order to comfort the child. NF were solely determined by parents' reports during the screening and intake interviews. The control group consisted of 30 healthy children from the same age group, recruited by similar methods. Exclusion criteria for both samples were: (a) major health or neurological–developmental problems; (b) the presence of a psychiatric disorder; (c) concurrent psychotherapy or similar interventions.

All parents signed informed consent and completed the questionnaires. The study was approved by the departmental ethical committee and the Israeli Ministry of Education [51].

2.4. Data analysis

We found no correlations between age and CBCL, CBQ, Koala or FSS-PC scores. However, there was a gender difference in the Kuala KFQ score, thus gender was entered as a covariate in the analyses. Between groups comparisons were based on ANCOVA, with control for gender. Due to unequal group sizes, differences in variance between the groups were tested for each variable. Significant differences in variance between the groups were only found for CBCL scales. In these cases, the group mean differences were analyzed under the assumption of unequal variances using the Student's t-test. This verified the statistical significance of all reported differences. CBCL internalizing score (the dependent variable) was predicted from group (NF/control) (an independent variable) using linear regression analyses. In the first model, age and gender were controlled. In the second model, CBQ attention control and inhibitory control were additionally included. Sobel test was used in order to examine whether CBQ attention control significantly mediated the influences of group on CBCL internalizing problems score.

3. Results

3.1. Comparison of FSS-PC and KFQ scores between clinical and control samples

A significant difference was found between the groups both in the FSS-PC score [$F(1,126) = 11.27$, $p < 0.001$] and KFQ scores [$F(1,135) = 6.95$, $p < 0.01$] showing that both FSS-PC and KFQ scores were higher in the NF group compared to control (Table 1).

Table 1
Differences in CBCL, CBQ, FSSC-R and scales between NF and control groups (gender controlled) (Mean ± SD).

	NF (N = 109)	Control (N = 30)	F score
CBQ Attention control score	4.2 ± 0.66	4.55 ± 0.74	6.1*
CBQ inhibitory control score	4.49 ± 0.76	4.9 ± 0.86	6.13*
FSSC-R total score	110.43 ± 37.79	86.47 ± 14.82	11.27**
FSSC-R without NF items score	92 ± 17.87	79.13 ± 14.01	13.19***
KFQ total score	58.21 ± 15.59	50.87 ± 10.77	6.95**
KFQ without NF items score	51.46 ± 14.02	45.57 ± 9.81	5.57*
CBCL internalizing score	13.77 ± 10.32	5.90 ± 4.11	16.57***
CBCL externalizing score	12.79 ± 8.84	8.07 ± 6.13	7.24**
CBCL total score	40.63 ± 27.93	22.23 ± 14.65	11.75**

* $P < 0.05$, ** $p < 0.01$, ***$p < 0.0001$.

Additionally, a similar analysis was performed after omitting the NF-related items from the total FSS-PC and KFQ scores. These items were found to be strongly associated with NF in previous studies [29,30] (e.g., fears of dark places, scary dreams, sleeping at friend's house, being alone, monsters, demons and other imaginary creature).

Similarly, a significant difference was found between the groups for both FSS-PC [$F(1,126) = 13.19$, $p < 0.0001$] and KFQ [$F(1,135) = 5.57$, $p < 0.05$] scores showing that these derived total FSS-PC and KFQ scores were higher in the NF group compared to controls also after excluding NF associated items (Table 1).

3.2. Comparison of behavioral (CBCL) main scales and effortful control (CBQ) scores between clinical and control samples

Significant differences were found between the clinical and control groups both in the CBQ attention control scale score [$F(1,132) = 6.1$, $p < 0.05$] and inhibitory control scale score [$F(1,132) = 6.13$, $p < 0.05$], and all main CBCL scores, Internalizing [$F(1,132) = 16.57$, $p < 0.0001$] Externalizing [$F(1,136) = 7.24$, $p < 0.01$] and total CBCL score [$F(1,136) = 11.75$, $p < 0.01$]; CBQ scales were lower and CBCL scales were higher in the NF group compared to controls. Thus the NF group exhibited impaired functioning across all the measures (Table 1).

3.3. Associations between NF, CBCL internalizing score and effortful control

The potential role of CBQ EC scales as mediating factors between NF and CBCL internalizing factors was assessed [52]. Table 2 shows the results of the linear regression analyses. Model 1 shows that after controlling for age and sex, group (NF/Control) predicts CBCL internalizing score ($\beta = -0.35$, $P < 0.0001$). After controlling additionally for CBQ scale scores of attention control and inhibition control

Table 2
Regression analyses: predicting CBCL Internalizing score from Group (NF/Control), age, gender and CBQ scales

Model	*B* (SE)	*β*	*T*
Model 1 (R^2 = 0.13)			
Age	0.07 (0.1)	0.05	2.76
Gender	0.53 (1.6)	0.03	0.32
Group (NF/Control)	−8.33 (1.9)	−0.35	−4.32***
Model 2 (R^2 = 0.26)			
Age	0.09 (0.09)	0.08	0.98
Gender	1.62 (1.54)	0.08	1.06
Group (NF/Control)	−6.27 (1.83)	−0.27	−3.42**
CBQ-Attention control	−3.36 (1.51)	−0.24	−2.24*
CBQ-Inhibitory control	−2.25 (1.3)	−0.18	−1.7

*P < 0.05; **P < 0.001; ***P < 0.0001. SE: standard error.

(see model 2), CBQ attention control (β = −0.24, P < 0.05) but not CBQ inhibitory control (β = −0.18, n.s) predicted CBCl internalizing score and group (Nf/control) predicted CBCl internalizing score to a lesser degree (β = −0.27, P < 0.05). CBQ attention control score (Sobel test = −2.22(0.8), P < 0.05) mediated the association between group and CBCL internalizing score (See Fig. 1).

4. Discussion

This study had two major aims: (a) to examine if pre-school children who suffer from significant NF also experience higher degree of general fears and behavioral problems; (b) to explore the role of EC as a mediator between NF and an overall tendency for internalizing problems.

In accordance with our hypothesis, the results demonstrated that children with severe NF also suffer from an increased level of a wide variety of fears other than NF, and exhibit more behavioral problems than controls in the same age group. This was manifested by higher scores for the clinical group of NF children compared to controls, both on parental and children's measures of general fears (FSSC-R and KFQ), and main CBCL scores (Internalizing, Externalizing, Total score). These results were also maintained after omitting the NF relevant items from both FSSC-R and KFQ.

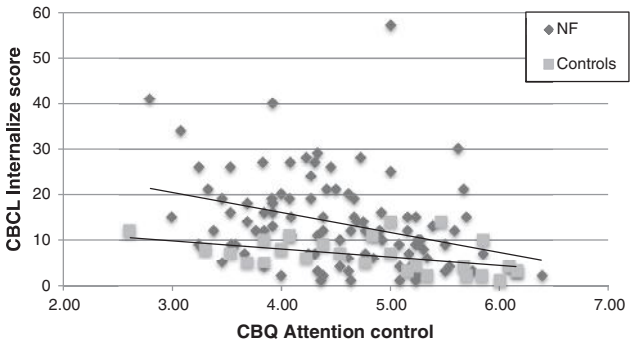

Fig. 1. CBQ Attention control score by CBCL internalizing score for Nighttime fears and control groups.

These findings can suggest that there is a group of children who are prone to develop higher levels of more general fears, including fears related to nighttime [53].

The study results also demonstrate that children with significant NF have lower abilities of EC (as manifested in CBQ attention and inhibitory control scales). However, only attention control mediated NF links to a wider and more problematic clinical picture of internalizing problems. This finding adds to previous findings emphasizing the involvement of attention control in the development of childhood anxiety disorders [25,26].

Although several recent studies suggest that children who exhibit high emotion regulation skills are less likely to develop anxiety problems [5], several studies failed to reveal evidence for the association between fears, anxiety and low EC abilities [54–56]. For example, Eisenberg et al., (2005) found that 6–9 year old children with internalizing behavior problems (i.e., primarily anxiety) scored low on impulsivity and high on regulation measures [57]. Thus, although some studies found that strong emotion regulation skills can reduce anxiety, other studies found that very high inhibitory control might be linked to higher anxiety levels in children [5]. Furthermore, the association between EC and internalizing problems may be affected by the type of EC measures and age [9,57]. Thus, the specific ages, measurements, magnitude of EC and gender-based contributions to emotion and behavior regulation should be further explored [5].

Research on temperament variables has important potential role to illuminate the development of child psychopathology [58]. Our results add a significant contribution to this field and provide evidence suggesting NF, which are very common during early childhood, in concert with specific regulatory tendencies could suggest higher risk for developing broader anxiety disorders during childhood.

It is interesting to note that sleep problems are reported to be a hallmark and an integral part of the clinical picture in children with NF as they tend to present difficulty going to sleep, falling asleep, frequent night wakings, and difficulty resuming sleep [28,31,34]. In line with our findings, a number of studies have suggested that children who develop sleep disturbances possess some specific temperamental or bio-behavioral characteristics that make them particularly vulnerable in this domain [59–66]. Thus, it might be speculated that there are common factors that put children in higher risk to develop both sleep and anxiety disorders, such as genetic (potentially genes involved in the serotonin system), environmental factors and cognitive biases [67]. This assumption should be further explored.

Several limitations of this study should be addressed. First, we focused at specific age range of a relative small sample of pre-school children, thus future studies should explore the links of fears and anxiety to EC measures in a wider age range encompassing a larger group of subjects. Second, because of the unique cultural and environmental circumstances of growing up in Israel, the generalization of our findings should be cautiously addressed. Another limitation of this study is its

cross sectional design. Future research should investigate the association of NF with other comorbid diagnosis (eg., ADHD, Learning Disabilities, and anxiety disorders) and EC measures using a longitudinal design.

In conclusion, our findings suggest that children with significant NF have elevated general fear levels and internalizing problems and exhibit lower EC abilities. These findings suggest that NF may serve as a marker for anxiety vulnerability. This vulnerability is linked to a temperamental bias of attention control. The identification of early vulnerability and risk factors for anxiety has vast importance in light of evidence suggesting that untreated anxiety in children is persistent, has adverse effects on child's development, and predicts adolescent and adult anxiety and psychopathology [68–72]. Moreover, previous studies suggest that comorbidity and the severity of clinical presentation predict psychopathology and less favorable treatment outcome in adolescence and adulthood [73–75]. Thus, early detection and treatment of NF may be significant in preventing more severe psychopathology in later development. Future longitudinal studies should test if pre-school children with NF presenting an elevated level of clinical symptoms are indeed at increased risk for later development of anxiety disorders.

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