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ORIGINAL PAPER

Assessment of brief interventions for nighttime fears in preschool children

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Abstract Nighttime fears (NF) and sleep problems continue to be major problems in clinical services. The aim was to assess the effects of two brief interventions on NF, and related sleep problems and parental fear-reducing behaviors in children. One hundred and four children aged 4–6 years with significant NF were randomly assigned into two intervention groups: the Huggy-Puppy intervention (HPI), which is based on providing children a puppy doll with a request to take care of the doll, and a revised version (HPI-r) which is based on providing the same doll with a cover story that the doll will serve as a protector. At baseline, the domains of NF, behavior problems, and sleep disruptions were assessed. Data were collected from parents and children using objective and subjective measures. The effects of the interventions were assessed by comparing four time points: baseline, first week of intervention, 1 month, and 6 months after initial intervention time. A waiting list comparison group (WL) was used as spontaneous recovery comparison group. Both interventions significantly reduced NF with similar impact. The improvement after 1 month was significantly higher than in the WL group. Furthermore, both interventions significantly reduced parental fear management behaviors and children's sleep problems. Finally, the reduction in NF and parental fear management strategies were maintained 6 months post-treatment. *Conclusions*: Relatively simple and cost-effective doll interventions can reduce NF and their associated sleep problems. Further research is needed to implement these interventions for other anxiety disorders in childhood.

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Mild and time-limited nighttime fears (NF) are very prevalent in normal development, and most children overcome or outgrow them [13, 20]. However, for many young children, nighttime and going to sleep pose a serious challenge [13, 28, 38], which leads to severe NF, persistent anxiety, and distress to the children and their families [12, 38]. Sleep problems are an integral part of the clinical picture in children with NF as they present difficulty going to sleep and falling asleep, frequent night wakings, and difficulty resuming sleep [5, 13, 38].

Parental presence near the child's bed during the process of falling asleep or in response to NF is a very prevalent fear management method that produces some relief in many cases [18, 34]. However, it can also serve as a reward for the child that perpetuates or create a new stubborn problem [3, 24, 27, 38, 47, 49]. Furthermore, research has shown that infants who rely on their parents during the settling process are more likely to have night waking problems [3, 27, 47, 49], and in children, this parental help may hamper the development of their self-soothing skills and can increase fears [3, 27, 38, 47, 49].

The development of cognitive–behavioral interventions for NF has followed the general direction of interventions for fears, phobias, and anxiety in children [10]. These interventions are based on multiple standard cognitive behavioral therapy (CBT) techniques [13]. The efficacy of these methods in the treatment of severe NF has been demonstrated in case studies and in a limited number of controlled studies [12–15, 20, 38]. However, significant limitations in this field have been identified, including: (a) difficulties identifying essential components of the interventions and specific child characteristics that predict

therapeutic response; (b) focus on wide age range and developmental stages, usually short follow-up; and (c) almost no reference to the effect of the interventions on other related domains (e.g., sleep disruptions) [13, 19, 28, 33, 38, 51]. Our study design has been developed in an attempt to meet some of these challenges.

Recently, Sadeh et al. [43] developed and tested a new intervention for anxious children under stressful situations, the Huggy-Puppy intervention (HPI). The HPI is based on providing young children who are undergoing severe stressful events with a new puppy doll and encouraging them to care for this needy puppy. Giving the child a caregiver role is assumed to promote self-esteem and shift attention from the child's internal distress and project his or her fears on the needy doll (for a detailed theoretical explanation, see [43]). It has been demonstrated that this intervention could be very effective in attenuating anxiety symptoms in young children exposed to war. However, the role of specific ingredients of the HPI has not been determined.

The revised version (HPI-r) was developed as a control/comparison intervention with potential therapeutic effects. It is based on providing the same doll with a different cover story that is based on the notion that the doll would be the child's friend and companion at night and would help the child in overcoming fears. This intervention is based on the old concept of a transitional or security object [52]. In young children, such objects are often very important in reducing stress, and it has been shown that children with attachment object are less likely to require help during the transition to sleep [50, 52, 53]. In addition, parents and children report that such objects serve as an effective method for coping with NF [13, 28]. However, to the best of our knowledge, this approach has never been systematically studied.

In light of the growing interest in NF in preschool children [13], the central aims of this study were to assess the effects of two different brief clinical interventions for NF (HPI and HPI-r), identify potential curative factors, and assess their long-term effects. Another important aim was to assess the effects of these interventions on sleep problems and parental fear management behaviors. To the best of our knowledge, this is the first study that uses both subjective and objective measures in the assessment of therapeutic response among NF children.

Our hypotheses were: (a) Both interventions would lead to reduction in nighttime fears and improvement in sleep; (b) the HPI-r intervention would be less effective than the HPI because it does not include the special role that the child receives as the doll's caregiver, with the related attention shift from the self and the implications for the child's self-esteem; (c) the interventions' effects would be predicted by compliance and the child's attachment to the Huggy-Puppy doll.

Method

Participants

The study was approved by the departmental ethical committee and the Chief Scientist of the Israeli Ministry of Education.

One-hundred and nine children (64 boys and 45 girls; mean age, 58.91±8.32 months) with reported severe NF participated in the study. Their parents sought treatment for NF. Children were recruited by brochures distributed to parents in kindergartens and information posted in parenting web sites offering a service for children with NF. Five families dropped from the study during the baseline assessment week. Thus, 104 children completed the second and third meetings (intervention meetings). Ten families in the HPI group and six in the HPI-r group failed to attend the follow-up meeting. A telephone interview of NF questionnaire for parents was conducted for these families. Chi-square test revealed no significant differences between the dropout rates in the two intervention groups. One family dropped out after the third meeting. See Fig. 1 for detailed description of the design, participants, and time course of the study.

Inclusion criteria for the entire sample were: the problem had to exist for at least 2 months with significant adverse impact on the child and the family, requiring the intervention of the parents for at least two nights per week to comfort the child. Exclusion criteria for the entire sample were (a) major health or neurological–developmental problems; (b) concurrent psychiatric treatment; and (c) concurrent psychotherapy or similar interventions.

Procedures

Initial phone screenings assessed whether the child meets the inclusion criteria and whether the parents were interested in participating in the study after receiving more information. Furthermore, the phone interview included assessment of the child's NF. A waiting list (WL) group (N=24) was composed of families whose first meeting was held 1 month after the initial phone interview.

Session 1 Parents and children included in the study were invited to the Children's Sleep Lab at Tel Aviv University. In this session, parents received a general description of the study, its purpose, importance, and course. Following this stage, parents signed the informed consent form and completed the Brief Child Sleep Questionnaire (BCSQ) and the Family Background Information questionnaire (FBI) [45]. After this phase, all parents and children underwent a separate interview developed by Muris et al. [28] to assess nighttime fears in children. Parents received

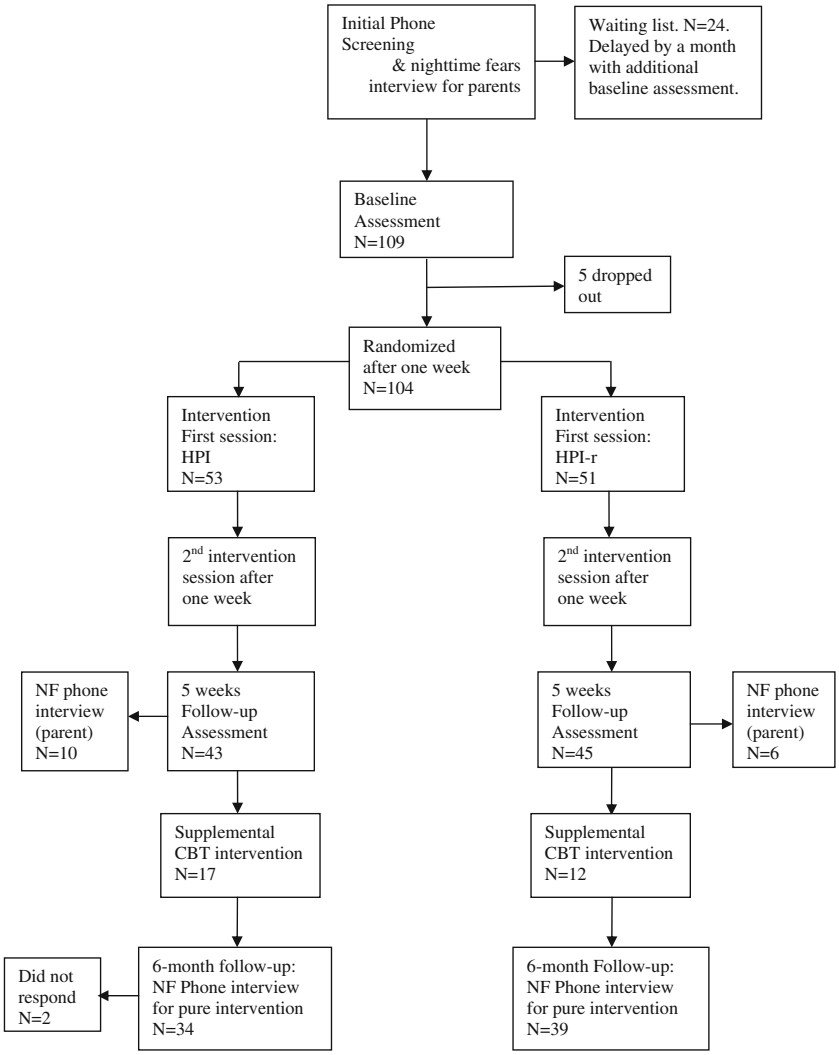

Fig. 1 Timeline of the research protocol

daily sleep logs [48] and an actigraph (AMA-32, Ambulatory Monitoring Inc., Ardsley, NY, USA) for a week of monitoring and also the Child Behavior Checklist (CBCL) [2, 55] for completion during this week. At the end of the first session, children were randomly assigned to one of two intervention groups: HPI and HPI-r groups. All parents and children were invited to the next session that was held the following week.

Session 2 After the experimenter reviewed the actigraph sleep data and daily sleep and fear logs with the parents, the intervention was introduced to the children and their parents according to the group they were assigned to. Parents received daily sleep logs and an actigraph for assessing the treatments progress during the week between sessions 2 and 3. All parents and children were invited to the next session that was held a week later.

Session 3 The experimenter reviewed the intervention's progress (via the actigraph plot and daily logs) with parents and the child and problems or difficulties were discussed. In the second part of this session, "attachment to doll" was assessed using the Doll Attachment Scale completed by the parents [43]. In addition, the experimenter completed a special checklist to assess the parents' motivation and compliance with the procedure.

Session 4 Four weeks after the third session, parents and children in both the HPI and HPI-r groups were invited and interviewed again, completing the full NF assessment using identical assessment methods used in the first session. Sleep was also assessed with identical measures as in the first session, including the BCSQ, daily sleep logs, and an actigraph that was sent to the parents a week before this session.

Follow-up assessment Six months after the completion of the interventions and initial assessment period, a final follow-up assessment of NF was performed by a phone interview.

Interventions Four graduate students in clinical psychology performed the interventions. All students had prior experience working with children and families in clinical settings. All students followed the written protocol for both the HPI and HPI-r groups.

The principles of the HPI and HPI-r have already been introduced. They require one session for describing the intervention and its rationale to the parents, introducing the doll and the cover story to the child, arousing the child's interest in the doll, and encouraging the parents to promote and maintain the child's attachment to the doll during the course of the intervention. The second intervention session served mainly to assess the child's response to the intervention and to encourage the child and the parents to pursue and follow the intervention guidelines. A manual describing the interventions has been prepared and the HPI manual has been used in our pilot study [43].

In cases where children showed no significant reduction in the level of NF (4 weeks after the third session), in both intervention groups, a supplemental CBT intervention was offered. It was based on principles identified as effective in previous research and practiced in our clinical service [13, 38]. They included desensitization by gradual withdrawal of parental presence in the child's bedroom and positive reinforcement for positive goal-directed steps [31]. Positive imagery and self-talk were also included [23]. These cases were not included in the 6-month follow-up because of these additional interventions.

Seventeen families in the HPI group and 12 families in the HPI-r group received a supplemental CBT intervention after completion of the Huggy-Puppy interventions. Chi-square test revealed no significant association between the intervention group and receiving CBT supplement.

Measures

Nighttime fears interview A structured interview conducted separately both for parents and children, which provides information on nighttime fears of children. The derived information included fear content, severity, frequency, and coping behaviors of parents and children in reducing nighttime fears [28, 29]. For children, the interview starts with a story that is read to the child from a picture book and sets the stage for talking about fears. To represent the severity of NF for each child, both at baseline and in the follow-up sessions, new variables were calculated by multiplying the frequency and level of NF as separately reported by parents and children's reports.

Dependency measures To assess the influence of the Huggy-Puppy intervention group and session time on parental fear-reducing behaviors at night (e.g., co-sleeping, limited presence near their children), a new variable was composed separately for parents and children's reports—*dependency score* (derived from items of the NF interview).

A total dependency score was computed by summing up each behavior that was applied at night in order to reduce the child's fears both at bedtime and during nighttime waking. The scoring was as follows: dependency in falling asleep scoring—falling asleep in parents bed=3 points; parents stay in the child's room until the child is asleep=2 points; parent stays in the child's room temporarily=1 point. Dependency during night wakings score—sleep in parents room through the night=4 points; child in parents room temporarily=3 points; parent comes and sleeps in child's room=2 points; parent comes and stays temporarily in child's room=1 point.

A similar calculation was performed for children's reports. Because it was difficult to separate coping behaviors when falling asleep from those after waking at night, one score was computed as follows: sleep in parents' bed=4 points; child stays in parents' room/bed for a limited time=3 points; parent sleeps near child through the night=2 points; parents stay in the child's room for a limited time=1 point.

Actigraphy Actigraphy is based on a miniature wristwatch-like device that is attached to the wrist of the child and records movement continuously for an extended period. Actigraphy has been established as a reliable and valid method for sleep assessment in infants, children, and adults [40, 42, 44]. The device enables continuous recording for extended periods (more than a week) with no interference with the child's natural sleep environment. The actigraph used in the present study is the miniature actigraph (Ambulatory Monitoring Inc.), preset to the standard mode for sleep–wake scoring algorithm with amplifier setting 18 and 1-min epoch interval [46]. The parents were asked to attach the actigraphs to their child's non-dominant wrist from the time they went to bed at night until their morning rise time. Actigraphic sleep measures included (a) sleep efficiency—percent of actual sleep time from total sleep duration, excluding wake time after sleep onset; (b) true sleep time—sleep time excluding all periods of wakefulness; and (c) number of night wakings (lasting at least 5 min). The Actigraphic Sleep Analysis program was used to score the data based on a validated sleep–wake scoring algorithm for children [44, 46]. The daily sleep logs were used to edit the actigraphic sleep data and for artifact removal [1]. Actigraphic measures were averaged over the weeks of monitoring (baseline, intervention, and follow-up). Although parents completed these reports at three time intervals, we assessed only the difference between baseline and follow-up meeting because we expected that the change

process would take more than a week after implementing the interventions.

Brief Child Sleep Questionnaire BCSQ provides information on children's sleep habits and problems. The questionnaire's items were derived from the Brief Infant Sleep Questionnaire (BISQ) [37] and from the Sleep Habits Questionnaire (SHQ) [45]. The BISQ was developed and validated for clinical and research purposes as a brief infant sleep screening tool [37]. Internal consistency (Cronbach's alpha) for the SHQ scales range between 0.72 and 0.82. [45]. Parents were told to rate their child's sleep based on the previous week. The items assessed sleep latency, number of night wakings, total time awake during the night, and sleep problems rating.

Child Behavior Checklist The CBCL was used to assess behavior problems as perceived by parents [2]. 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 [55]. Raw scores were used because of the narrow age range with similar normative ranges.

FBI questionnaire This questionnaire includes 25 questions covering demographic and developmental data [41, 48].

Mediating factors Based on the recommendation of Prins and Ollendick [33], an assessment of mediating factors in treatment was included. Two factors were assessed: (a) "Attachment to the doll", using the Doll Attachment Scale that has been validated and found to be significantly correlated with the effect of the HPI [43]. Parents were asked a number of questions to assess the child's attachment to and care for the Huggy-Puppy. One summary variable (average rating across the items) was calculated to represent the child's attachment to and care for the doll. In the presented study, the internal reliability of this scale, based on Cronbach's alpha, was 0.77. (b) A special checklist was developed to assess the motivation and compliance of the parents with therapist's recommendations. The therapist completed this scale following the third meeting. In the presented study, the internal reliability of this scale, based on Cronbach's alpha, was 0.75.

Data analysis

Data analysis was based on the principles set by Chambless and Hollon [7] and other experts [19] for defining empirically supported therapies. The main analyses included a comparison between two different clinical interventions and a comparison to waiting list control. All analyses were based on analysis of covariance (ANCOVA) performed using general linear models (SAS, Ver 9.0) for each outcome measure. The main outcome measures (nighttime fear scores, parents' fear-reducing behaviors, sleep disruptions) served as the dependent measures; intervention groups (HPI versus HPI-r) and gender as the between-subjects independent variables; and time (baseline and all the immediate and follow-up time points, depending on the specific comparison) as the within-subjects independent variable. Age, attachment to the doll, and compliance were used as covariates to control for age effects and to examine for possible interaction with these variables.

A comparison to a WL group (N=24) was performed to compare the effects of the interventions to the potential impact of the passage of time (1 month from first intervention session to the 1-month follow-up). The WL group was composed of families whose first meeting was held at least 1 month after the initial telephone interview. To compare the effects of the interventions on NF (parents' reports) with the WL group, a new variable was calculated, contact number ("first" and "second"). For the WL group, the first contact was the telephone interview and their second contact was the first session interview. For the intervention group, the first session was the first contact and the second contact was the follow-up session. In both groups, the time difference between measurements was about 1 month.

Results

Socio-demographic variables and CBCL scales

Separate t tests (or chi-square test) revealed no significant difference between the HPI and HPI-r groups for age, gender, or any of the other socio-demographic variables (see Table 1). There was also no association between gender and intervention group, and no significant differences were found between the intervention groups on all CBCL scales.

Main intervention effects

For simplicity, we relate to the effect of time (from baseline to the follow-up assessments) as the intervention effect. No significant group by time interactions were found, indicating no differences between the effects of the HPI and the HPI-r. With regard to the NF measures, the ANCOVA revealed a significant intervention effect on nighttime fears as reported by both parents and child, showing reduction in reported fears following the interventions (Table 2). The partial eta squared effect sizes estimate were 0.70 and 0.53 for parents' and child's reports, respectively.

Table 1 Socio-demographic measures in both intervention groups for children completing treatment (mean ± SD)

	HPI	HPI-r
Child's age (months)	59.72±8.67	58.12±7.89
Mother's age (years)	36.12±3.88	35.85±4.65
Child's gender (% of boys)	58.5	60.8
Mother's education (years)	15.58±2.48	15.70±2.10
Mother's workload (hours per week)	32.93±13.41	33.10±14.76
Father's age (years)	38.28±4.40	37.61±5.03
Father's education (years)	15.38±2.54	14.97±2.67
Father's workload (hours per week)	48.29±10.69	45.86±14
Order of child	1.58±0.86	1.59±0.79
Number of children in family	2.29±0.86	3.22±6.72
Child Behavior Checklist Score	37.57±29.53	45.59±25.71

There was no significant difference between the groups

The ANCOVA revealed a significant intervention effect on the dependency scores (as reported by the child and the parents), indicating that these scores were lower after the interventions compared with baseline. The partial eta squared effect size estimates were 0.57 and 0.08, respectively. No other significant effects were found (Table 2).

With regard to the actigraph sleep measures, the ANCOVA revealed a main intervention effect on the number of night waking, showing that the number of night wakings after the interventions was significantly lower compared with baseline. The partial eta squared effect size estimate was 0.05.

On the BCSQ measures, the ANCOVA revealed significant intervention effects on sleep latency, total time awake during the night, and number of night wakings, showing improvement in all these sleep measures from baseline to follow-up assessment. The partial eta squared effect sizes estimates for these measures were 0.17, 0.15, 0.22, and 0.5, respectively (Table 3).

Predictors of intervention response

As described in "Data analysis," age, sex attachment to the doll, and compliance were included in the general linear model to assess their role in predicting or moderating the effects of the intervention. Significant three-way interactions between time, group, and attachment to the doll were found on nighttime fears as reported by the parents (F=9.99, p<0.005) and by the child (F=5.86, p<0.05). These interactions indicated that in the HPI group, children with stronger attachment to the doll benefited more from the intervention. A significant two-way interaction was found between time and attachment to doll on the child dependency score (F=8.97, p<0.005). This interaction indicated that on the child-reported score, the dependency score improved significantly more in children with higher attachment to the doll.

Comparison to the waiting list group

ANOVA revealed a significant interaction effect between contact number and group [$F(1,103)$=31.54, p<0.0001]. Simple effect analysis revealed that the reduction in parentally reported NF score [$t(79)$=14.27, p<0.0001] between the first (mean=5.55, SD=1.04) and second contacts (mean=1.99, SD=2.1) in the intervention group was higher than the reduction in the WL group [$t(24)$=2.51, p<0.05] between the first (mean=6.00, SD=0) and second contact (mean=5.16, SD=1.68).

Follow-up 6 months post-treatment

Among those who did not receive CBT supplement intervention at the follow-up meeting, 97.3% (73 families) completed the NF interview. NF and dependency scores were assessed only for children who did not receive a supplemental CBT intervention after the original interventions.

The ANOVA revealed significant effect for session time on NF score and the dependency score. Contrast analysis revealed that the NF score [$F(1,71)$=243.22, p<0.0001]

Table 2 Main effects for session time on nighttime fears' measures for both Huggy-Puppy intervention groups (mean±SD)

Outcome measures	Baseline	Intervention	F	Partial η^2
Nighttime fears—Parent	5.5±1.11	2.11±2.03	264.2**	0.70
Nighttime fears—Child	4.79±1.55	2.25±2.14	97.8**	0.53
Dependency—Parent	4.85±1.73	2.13±2.15	129.9**	0.57
Dependency—Child	2.02±1.68	1.37±1.64	5.94*	0.08

*p<0.01, **p<0.0001

Table 3 Comparison of subjective and objective sleep and fear measures between baseline and follow-up sessions for both interventions (mean±SD)

	Baseline	Follow-up	*F*
BCSQ measures			
Sleep latency (min)	29.82±24.44	19.35±12.03	18.42***
Total time awake during the night	23.02±30.35	9.74±17.72	11.35**
No. of night wakings	2.5±1.8	1.56±0.92	14.86**
Actigraphic measures			
No. of night wakings	2.76±1.26	2.47±1.1	4.22*
Sleep efficiency (%)	89.64±4.77	90.64±4.85	3.69
True sleep time (min)	511.5±38.08	516.98±46.6	1.70

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

and the dependency score [$F(1,71)=144.46$, $p<0.0001$] were significantly lower at the follow-up meeting compared with the baseline. However, no significant difference was found in NF or dependency scores between the first follow-up meeting (1 month after initial baseline assessment in comparison to the 6-month follow-up assessment; see Fig. 2).

Discussion

The main aims of this study were to assess the effects of two brief interventions on children's NF, sleep problems, and parental fear management strategies. Our results indicate that both interventions, as reported by the children and their parents, substantially reduced NF and parental fear management strategies in preschool children with medium effect sizes (partial $\eta^2>0.50$) [8, 9]. The improvement in both groups was very similar and significantly higher than in the WL group over a similar time interval. These outcomes reflecting significant reduction in fears and parental fear management behaviors were maintained in the 6-month post-treatment follow-up.

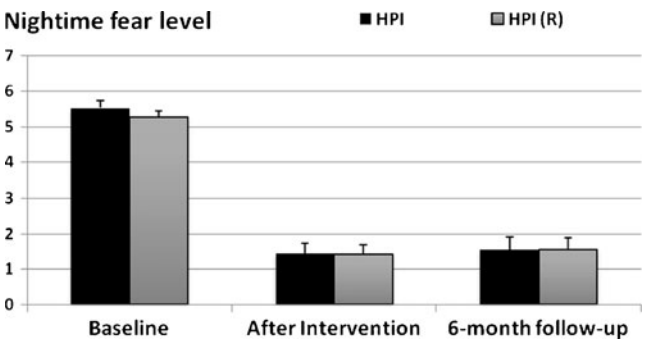

Fig. 2 Nighttime fear level during the baseline, immediately following the intervention, and at the 6-month follow-up: means and standard errors for each intervention group

The findings in the HPI group resemble those of the original HPI research described earlier[43]. A similar intervention has also achieved a reduction of symptoms in only a few therapeutic sessions with a 5-year-old boy suffering from a persistent condition of encopresis and two young girls who had experienced the traumatic impact of a car hijack. In this report, a "teddy bear therapy" was applied, in which the children "helped" a teddy bear who had problems similar to their own [4].

As mentioned, the reduction in NF in the HPI-r group was similar to the reduction in the HPI group. Thus, our findings suggest that providing children with a "protector doll" can also serve as a very effective method in reducing their nighttime fears. The benefits of using dolls and simulation with dolls to reduce children's fears in anxiety-provoking situations have been shown in previous studies [6, 21, 25]. However, to the best of our knowledge, this present study is the first that has systematically assessed and documented that introducing an attachment object for preschool children is efficient in reducing nighttime fears.

Identifying specific effective (or "curative") elements of interventions is a very difficult task in psychotherapy research [22, 35, 51]. In the HPI group, our findings indicate that the child's attachment and preoccupation with the doll was indeed associated with a higher reduction in NF. A similar link between attachment to the doll and reduced anxiety symptoms has been found in the original HPI study [43]. However, in the HPI-r group, no such links have been demonstrated with regards to NF, and the intervention's effect cannot be linked to these factors. The fact that the associations between attachment to the doll and the efficacy of the interventions were different for each intervention group can suggest that different therapeutic mechanisms underlie each intervention.

With regard to the mechanisms underlying the HPI-r, several speculations were raised regarding the factors explaining the effect attachment objects. Rutter [36] claimed that because the object is inanimate, a child is able to exert far more control over it than over the mother, and such an object is "the purest example of a protective effect" (p. 602) due to its ability to influence the child's behavior despite its own inaction. Others argue that in general, these objects appear to have an arousal- or anxiety-reducing function [32, 52] that is learned because of its association with positive consequences.

The results of our study do not enable ruling out the role of nonspecific therapeutic factors such as involvement in the assessment and discussion of the problem, positive expectations, providing a small gift to the child (the doll). The role of these factors should be assessed in future intervention studies.

Another important finding was that in tandem with NF reduction, there was also improvement in sleep quality and reduction in sleep problems, measured both by objective and subjective measures in both intervention groups. Actigraphic measures revealed that the number of night wakings after the interventions was reduced similarly in both intervention groups. Data derived from the daily sleep logs also showed similar improvement in children in both intervention groups in sleep quality. Surprisingly, there are no studies directly linking NF with objective findings on sleep disruption in young children. To the best of our knowledge, this is the first study to document significant improvement in sleep problems in children with NF following intervention using both objective and subjective measures.

The positive impact of these interventions on sleep is of particular importance considering that sleep disruptions and insufficient sleep are associated with a wide range of behavioral, cognitive, and mood impairments in children and adolescents [16, 17, 30, 39]. Research has shown that the resolution of a sleep problem has the potential to resolve related psychopathology and lead to great relief in the family [11, 26, 54].

The limitations of our study should be emphasized. The main limitations are related to the lack of "placebo" group comparison and the fact that the two intervention groups led to similar positive effects, which preclude identifying specific curative factors and full understanding of the underlying mechanisms of change. Notwithstanding these limitations, our findings indicate that brief interventions, administered in two sessions, can lead to a significant relief in persistent nighttime fears and improve the sleep patterns of young children. Further research is needed to revalidate these interventions and explore other potential areas of application.

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Conflict of interest The authors have no conflict of interest to report.

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