

Treatment of sleep problems in families with young children: effects of treatment on family well-being

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Aim: To evaluate a standardized sleep programme that is a two-step variation of graduated extinction, where the child is first taught to fall asleep by him/herself at bedtime (first intervention) and two weeks later also after night awakenings (second intervention). As it has been claimed that extinction procedures may be harmful to the child, this study documents both night- and daytime behaviour before and after interventions. **Method:** The study included a total of 95 families, with children from 4 to 45 mo of age exhibiting frequent signalled awakening episodes during the night. Sleep diaries, visual analogue scales (VAS) on daytime behaviour and the Flint Infant Security scale, completed by parents, were used as instruments. Parents also completed VAS scales and the Swedish Parenthood Stress Questionnaire scales on their own well-being. **Results:** All families carried out the interventions. Parents reported significant improvements in sleep quality, daytime behaviour and family well-being as early as two weeks after the first intervention. Before intervention, the sleep-disturbed children were rated as more insecure than a matched comparison group with unknown sleep behaviour. This difference was eliminated after the interventions. The more anxious the children were rated before intervention, the more they tended to benefit from it.

Conclusion: If parents experience young children's night awakenings as a problem, teaching the children to fall asleep by themselves usually solves this problem quickly. According to parental ratings, family well-being and negative daytime behaviour are also improved

Key words: *Behaviour, children, family well-being, intervention, night waking*

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In Western societies one of the most common problems encountered by parents of young children is the management of bedtime and night waking (1, 2). Not all parents of infants or toddlers who need help to fall asleep in the evening or settle back to sleep after night wakings rate this as a problem. However, according to studies from many countries (e.g. 3–5) approximately 20%–30% of families have problems with sleep onset delay and/or frequent night wakings during their children's first 2 or 3 y of life.

When frequent night wakings in early childhood are perceived as problematic by the parents, they are associated with an increased risk of behavioural problems several years later (6, 7), as well as family stress (8) and maternal depression (9, 10). They also tend to persist until later childhood if untreated (7, 8). Training a child to fall asleep without parental intervention can solve these sleep problems according to two recent meta-analyses of all the published treatment studies (11, 12).

The most effective method used to teach a child to fall asleep alone is extinction. Extinction procedures involve putting the child to bed at a designated bedtime and then systematically ignoring the child until a set

time the following morning. Because of the child's protests the method has low parental acceptance and compliance (13). Rather than having the child cry for long periods, a variety of different "graduated extinction" procedures are used in clinical practice (2, 14).

Even when graduated extinction is practised, most children cry. Parents who are told to let their child "cry it out" without comforting him/her, rightly perceive this as a violation of their parenting instincts. Many parents also believe that by acting against their instincts they will make their child unhappy and insecure. Their distrust of the method is heightened by its condemnation in some popular literature. It is, for example, asserted that "a mother who restrains from responding to her baby, gradually and unknowingly becomes insensitive, starting a vicious circle of detachment". She will "undermine the infant's trust and damage the infant's emerging self-esteem" (15).

Apprehensions about systematic ignoring having negative consequences for parent–infant interactions or the infant's development should, of course, be taken seriously. Signs of impaired interaction or negative changes in the child's behaviour after treatment should be looked for. A few of the many treatment studies

using the extinction method (graduated or not), have also recorded behaviour other than the infant's sleep (14, 16, 17). They all speak in favour of the positive consequences instead of the negative when the extinction method is used in families with sleep problems.

In a study by Minde et al. (14), 28 children with serious sleep problems and 30 matched controls were compared on behaviour rating scales, on sleep patterns, and during feeding interactions with their mothers. After treatment the sleep-disturbed children improved in all these respects.

France (16) measured and compared the behaviour characteristics and security scores of 35 infants treated with extinction with those of 13 untreated and 15 normal sleep controls. There was no evidence of detrimental effects on the treated infants whose security, emotionality/tension and likeability scores improved, in contrast to the sleep-disturbed control group, whose likeability score changed for the worse.

In a study by Seymour et al. (17) there were no negative side effects but 35 out of 48 parents reported positive changes in the daytime behaviour of their children. In a few studies positive effects on the infant's daytime behaviour have been reported without any measurements being taken, but there are no studies reporting negative effects.

This study was conducted with the objective of evaluating a standardized sleep programme that had been employed and developed by the author over a 15-y period. The programme is a two-step variation of graduated extinction, where the child is first taught to go to sleep by him/herself at bedtime (intervention 1) and at a later stage also to go back to sleep by him/herself after night awakenings (intervention 2). As parents in Sweden have been warned in the mass media against using this method, with allegations that they may harm their child forever, the evaluation included both sleep and daytime behaviour.

The purpose of this study is to describe the impact of the intervention on the sleep behaviour of young children, as well as children's daytime behaviour (including mood and security in different situations) and parental well-being (emotional status and parenting stress) over time. In an earlier paper the programme and its effect on the sleep behaviour of children under 18 mo of age is described in more detail (18).

Method

Subjects

All families with young children who sought help for frequent night awakenings at the Child Clinic in Falun or were referred from Child Health Centres over a 15-mo period were offered the opportunity to participate in the study. All families agreed. Exclusion criteria were parasomnias and physical disorders causing disturbed sleep.

Of the 108 children that were invited to take part in the study, 13 were excluded. Two of these children had a history that indicated cow's milk allergy (daytime fussiness only) and their sleep and daytime behaviour was completely normalized by milk elimination. One child had confusional arousals, eliminated after scheduled awakening. In the other 10 cases the parents did not manage to complete more than a few sleep diaries. These participants were contacted by telephone and seven of them reported very few night awakenings since the new bedtime routines were introduced, two reported "much better" sleep and one participant had discontinued the programme because the mother had become ill and had to be admitted to hospital.

The remaining 95 children comprised 48 boys and 47 girls, mean age 14.8 mo. Sixty-seven children were 4 to 17 mo old and 28 were 18 to 45 mo old. Thirty-six of them were only children and 2 were from one-parent families. Eleven of the mothers and 5 of the fathers were immigrants. The educational levels of the parents did not differ between the age- and gender-matched populations of the county.

The mean duration of sleep problems was 8.2 mo, or, in relation to the children's ages, 54% of their lifetime, with a distribution of between 9% and 100%.

Sleep programme

The standardized sleep programme to be studied comprises two interventions. First, the child is taught to fall asleep on his/her own at bedtime only (intervention 1 or *Iv1*). The child is put to bed after a bedtime routine. Two somewhat different methods are then used, depending on whether the child is able to climb out of his/her bed or not. If the child uses a crib, the parents are to leave the room and give him/her only brief verbal contact about every fifth minute for as long as strong protests continue.

If the child is old enough (usually more than 18 mo of age) to leave the bed, the parents are instructed to sit and read in a chair just outside the child's room, paying as little attention to the child as possible. As soon as the child leaves the bed he/she is put back immediately. After a few evenings, when the child has learned to fall asleep without protesting, the parent starts making short excursions from the chair while the child is still awake. The parent stays away for successively longer periods every evening until the child has fallen asleep during the parent's absence.

If the child wakes up during the night he/she is comforted and gets the same help as before to go back to sleep as long as intervention 1 is carried through. After some evenings have passed, when the child has learned to fall asleep alone without too much protesting, he/she is also taught to go back to sleep alone after night awakenings (intervention 2 or *Iv2*).

In this study, intervention 2, which in practice is usually implemented within one week, was standar-

dized until after two weeks in order to test the following hypothesis: "If children are taught to fall asleep by themselves at bedtime only, they often stop signalling night awakenings as well". The results from testing this hypothesis (which was supported) are published elsewhere (18).

Design

All families, except those mentioned in the next paragraph, had an hour-long consultation with the clinician (the author) the same day as intervention 1 was to be implemented. The child was examined and the parents were asked details about his/her day and night-time behaviour. The clinician informed himself of the family situation and well-being. Symptoms relating to parent depression were especially asked for. A general explanation for night awakening was given. Based on the specific family conditions, the parents were given concrete and detailed advice on how to implement *Iv1* in the best way. The parents also received written information to take home. Details of its contents, which include the theoretical background and explanation for night awakenings, as well as a very descriptive two-step solution to the problem, can be obtained from an earlier publication (18). The parents received telephone calls the next day and as needed thereafter. After two weeks, there was a new consultation, lasting about half an hour, when intervention for night awakenings was introduced (intervention 2). This consultation was also followed by at least one telephone call. In total, the support and advice took 2–3 h per family. At 1 and 3 mo after *iv2*, parents received sleep diaries and questionnaires by mail for follow-up registrations.

The study was also designed to evaluate the use of written parental information without any other support in connection with intervention 1. Twenty-eight of the families with children under 18 mo of age were therefore randomly assigned to a "written information group". They received the written information by mail and one day later a short telephone call from the therapist, screening for physical disease, but no consultation and no further calls were made until intervention 2. As the treatment results (18) did not differ between this group and an "advice and support group" in any respects, the groups will be dealt with as one group in this report on the study.

Two gender- and age-matched controls to each child in the study were randomly selected from the national register without any knowledge of their sleep behaviour or any demographic data on their parents. Of these 190 selected controls, 167 returned a questionnaire used for comparison of behaviour (Child comparison group).

The study was approved by the Ethics Committee, Faculty of Medicine, Uppsala University.

Measures

The parents completed a *sleep diary*, starting one week

before intervention 1 (*Iv1*) and running until 1–2 wk after intervention 2 (*Iv2*). Additional entries were recorded for one week at 1 and 3 mo after *Iv2*. Diary entries gave the following information: 1) the time the child was put to bed; 2) duration of protests in the evenings following intervention; 3) the time it took to fall asleep; 4) the number and duration of signalled night awakenings; and 5) total time asleep during the night, as perceived by the parents. Of these, only (4) and (5) are reported in this paper. At the beginning of the study many parents did not register daytime naps. This was particularly true for those with children in day care. However, sleep duration was recorded for 76 of the children, making it possible to measure total sleep time. An independent interpreter computed the sleep diaries.

Parents' evaluation of the sleep problem was registered on a 5-point Likert scale (1 = completely solved; 5 = worse) at the 1-mo and 3-mo follow-ups. Parents were also asked to report whether the child had had a common cold since the latest registration, and whether they thought the infection might have had a negative influence on sleep quality as recorded in the sleep diaries.

The parents registered the children's daytime behaviour using two different instruments. The mother and the father independently registered their assessments of their child's behaviour on five 100-mm visual analogue scales (VAS) comprising the following states of opposition: alert–tired; good appetite–poor appetite; happy–depressed; secure–anxious; accommodating–obstinate. The mark was recorded as 0 at the "negative" end of the scale and 100 at the "positive" end. The registrations were made on four occasions: one week before *iv1*, two weeks after *iv1* and at the 1-mo and 3-mo follow-ups.

Daytime behaviour was also registered by means of the Flint Infant Security Scale (FISS), as modified to a questionnaire by France (16). Reliability and validity of the scale has been established for infants younger than 24 mo of age (19). As the aim of the study was to detect changes in daytime behaviour rather than actually try to measure "security", the instrument was also used on the 16 children that were more than 24 mo of age. Registrations were made by the parents one week before *iv1* and at the 1-mo follow-up. This scale contains 37 items, scored on 5-point Likert-type scales, describing the infant's behaviour in different situations. Fifteen items reflect the infant's feeling of "dependent trust", i.e. recognition that his/her needs will be met by consistent recurring attention by the parent, as shown by the infant's ability to accommodate or co-operate ("dependent behaviour"). Example: "Enjoys rough play" versus "Dislikes rough play". Twenty-two items reflect the infant's feeling of "self-trust", as shown by his/her self-initiated activity and ability to self-regulate ("effortful behaviour"). Example: "Recovers readily when physically hurt or if feelings are hurt" versus "Upset for a long while if physically hurt or if feelings

Table 1. Pre- and post-treatment sleep quality for each age group according to parental registrations.

	Before <i>iv</i>	After <i>iv1</i>	After <i>iv2</i>	1-mo follow-up	3-mo follow-up
Mean number of night awakenings					
Age <18 mo	4.4 (1.9) (<i>n</i> = 67)	3.1 (1.6)*** (<i>n</i> = 67)	2.1 (1.2)*** (<i>n</i> = 51)	1.5 (1.4) (<i>n</i> = 60)	1.0 (0.8)* (<i>n</i> = 55)
Age ≥18 mo	2.3 (1.5) (<i>n</i> = 28)	1.8 (1.0) (<i>n</i> = 28)	1.6 (0.9) (<i>n</i> = 13)	1.1 (1.0)* (<i>n</i> = 17)	1.1 (1.2) (<i>n</i> = 22)
Mean time awake nights (min)					
Age <18 mo	82 (43) (<i>n</i> = 66)	50 (26)*** (<i>n</i> = 66)	33 (20)*** (<i>n</i> = 51)	25 (23) (<i>n</i> = 60)	18 (22) (<i>n</i> = 55)
Age ≥18 mo	61 (40) (<i>n</i> = 28)	35 (19) (<i>n</i> = 28)	27 (18)* (<i>n</i> = 13)	18(15)* (<i>n</i> = 16)	19 (22) (<i>n</i> = 22)
Mean night sleep time (min)					
Age <18 mo	563 (55) (<i>n</i> = 66)	600 (40)** (<i>n</i> = 66)	620 (44)* (<i>n</i> = 52)	625 (44) (<i>n</i> = 58)	627 (42) (<i>n</i> = 55)
Age ≥18 m	604 (52) (<i>n</i> = 28)	631 (39) (<i>n</i> = 28)	629 (28) (<i>n</i> = 13)	648 (27) (<i>n</i> = 17)	652 (45) (<i>n</i> = 22)
Mean total sleep time (min)					
Age <18 mo	690 (59) (<i>n</i> = 58)	726 (48)** (<i>n</i> = 57)	741 (50) (<i>n</i> = 46)	741 (52) (<i>n</i> = 49)	743 (57) (<i>n</i> = 44)
Age ≥18 mo	648 (56) (<i>n</i> = 18)	682 (50) (<i>n</i> = 18)	663 (50) (<i>n</i> =)	675 (44) (<i>n</i> = 12)	681 (53) (<i>n</i> = 14)

Standard deviations within parentheses.

n = number of children.

Significance refers to comparison with the nearest preceding value.

p* < 0.05; *p* < 0.01; ****p* < 0.001.

are hurt". The two items on sleep behaviour were omitted in this study, ensuring that security scores were not affected by changes in sleep resulting from the intervention. Scores on the scale are ratios, multiplied by 10, with higher scores denoting more security (range from -10 to +10).

Both parents made an assessment of their own emotional status using VAS at the same time as they made their VAS assessments of their children's daytime behaviour. The scales covered the following states of opposition: alert-tired; happy-depressed; hopeful-dis-couraged.

Maternal emotional status was also registered by means of a Swedish version of Abidin's Parental Stress Index questionnaire, i.e. the Swedish Parenthood Stress Questionnaire (SPSQ). In normal Swedish samples, the instrument has a stable factor pattern, which formed the basis for five subscales (Incompetence, Role Restriction, Social Isolation, Spouse Relationship Problems and Health Problems), measuring different aspects of parents' perception of stress in their parenting role (20). The SPSQ contains 34 items, scored on 5-point Likert-type scales. The mothers made the registrations one week before *iv1* and at the 1-mo follow-up. Values from a population-based sample of 1500 Swedish mothers with children aged from 6 mo to 3 y (21) were used for comparison.

The parents in the child comparison group completed the FISS.

Missing data

All families included in the study recorded daily entries

in the sleep diaries one week before and two weeks after *iv1*. Thirty-one families neglected to send entries for more than a few days after *iv2*. Many children already slept better during the second or third registration week (before *iv2*) as a result of *iv1* only, which may explain why so many parents were not motivated to continue with the sleep diaries for a whole week after *iv2*.

At both the 1- and 3-mo follow-ups, 18 families did not send sleep diaries despite reminders (7 families failed on both occasions). Those parents often failed to send the other questionnaires relating to the follow-ups as well. Reasons given during telephone reminders were forgetfulness and "too many papers". An analysis of the existing data gave no indication that lack of treatment efficacy was a major cause for failing to return questionnaires. Thus, number of night awakenings and duration of the children's protests following the interventions did not differ between families who sent the questionnaires and those who did not. Parents who returned the follow-up questionnaires on one occasion only reported just as much improvement in the sleep problems as those who returned questionnaires at both follow-ups.

Statistics

Data were coded, registered and analysed using SPSS, version 11.0. A paired samples *t*-tests were used when testing the significance of differences between means when only two registrations were made. The univariate ANOVA was used to analyse changes in sleep quality, behavioural parameters and parental well-being. To determine whether the data permitted a univariate test,

Table 2. Parents' feedback on the sleep problems at the 1-mo and 3-mo follow-ups (1-mo follow-up in parentheses).

The sleep problem is		Age <18 mo	Age ≥18 mo
Completely solved	<input type="checkbox"/>	(16) 26	(8) 8
Much better	<input type="checkbox"/>	(39) 24	(6) 12
Somewhat better	<input type="checkbox"/>	(6) 4	(4) 4
Unchanged	<input type="checkbox"/>	(-) 1	(-) -
Worse	<input type="checkbox"/>	(-) -	(1) -
No answer	<input type="checkbox"/>	(6) 12	(9) 4
	Total	(67) 67	(28) 28

Mauchley's test of sphericity was performed. If the sphericity assumption was rejected, we used the Greenhouse-Geisser correction. The development over time was further analysed by comparing the value at a time point with the value at the preceding time point. All *p*-values below 0.05 were considered as significant.

Results

Sleep quality

The number of signalled night awakenings was significantly higher for the 67 infants under 18 mo of age ($p < 0.001$), the main problem with the 28 older children often being bedtime difficulties. As the therapeutic methods also differed for infants below and over this age, the results are reported separately for each age group.

A summary of how the parents assessed their children's sleep before and after the interventions is presented in Table 1. All sleep parameters were significantly improved over time in both age groups. Thus, improvement over time was significant for number of signalled awakenings [$F(2.0, 58.7) = 60.7$; $p < 0.001$ in the younger age group and $F(4, 32) = 7.3$; $p < 0.001$ in the older age group], registered time awake during the night [$F(2.3, 67.5) = 53.8$; $p < 0.001$ and $F(1.3, 10.4) = 5.8$; $p = 0.030$, respectively], registered night sleep time [$F(4, 116) = 20.5$; $p < 0.001$ and $F(4, 32) = 3.7$; $p = 0.014$, respectively] and total sleep time [$F(2.6, 75.8) = 12.1$; $p < 0.001$ and $F(4, 32) = 3.2$; $p = 0.025$, respectively].

Total registered sleep time increased by 53 min for the younger age group and by 33 min for the older group. The shorter the time had been before intervention, the greater was the increase ($r = 0.67$, $p < 0.01$). Thirteen of the children increased their registered total sleep time by more than two hours.

Individual comparisons of the number of signalled awakenings before and after interventions showed that 80% of the children had fewer signalled awakenings after *iv1*, 92% after *iv2*, 92% at the 1-mo follow-up and 94% at the 3-mo follow-up.

At the 1-mo follow-up, 44 of the parent couples reported that their child had had a common cold since the last registration. In 22 of these cases the infection was assumed to have had a negative effect on the number of night awakenings registered in the sleep diaries. At the 3-mo follow-up, the numbers were 43 and 20, respectively.

In addition to the sleep diaries, the parents also made a general evaluation of the sleep problem at both the 1-mo and 3-mo follow-ups. As shown in Table 2, the problem had improved at both follow-ups in all but one of the families that gave some feedback. Two parent couples reported that they had relapsed into helping their child to fall asleep in the evening.

Daytime behaviour

On four occasions both parents independently registered their impression of their child's mood and behaviour on five 100-mm VAS instruments. There were no significant mean differences between mothers' and fathers' registrations, with the exception of before intervention, when the mothers rated their children as being more tired ($p < 0.05$). This report uses the mean of mothers' and fathers' values. Boys were rated as more alert ($p < 0.05$) and the younger age group as more alert ($p < 0.05$) and accommodating ($p < 0.05$), but as there were no significant differences in behavioural change, all the children are dealt with as one group. In Table 3 a summary is presented showing how the parents assessed their children's mood and behaviour before and after the interventions (higher values indicating a more positive mood or behaviour).

According to their parents, the children, as a group,

Table 3. Parents' assessments of their children's behaviour. Mean VAS values before and after interventions (scale 0–100).

	Before <i>iv1</i>	2 weeks after <i>iv1</i>	1-mo follow-up	3-mo follow-up
Registrations (mothers' + fathers')	(N = 188)	(N = 152)	(N = 142)	(N = 152)
Alert-(tired)	67 (24)	75 (21)**	72 (25)	80 (20)***
Good appetite-(bad appetite)	57 (23)	67 (22)	65 (24)	67 (21)
Happy-(depressed)	68 (21)	79 (18)***	76 (22)	81 (18)
Secure-(anxious)	46 (26)	63 (24)***	57 (28)	67 (24)**
Accommodating-(obstinate)	45 (20)	57 (22)***	55 (24)	53 (23)

VAS: visual analogue scales.

Standard deviations within parentheses. Significance refers to comparison with the nearest preceding value.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

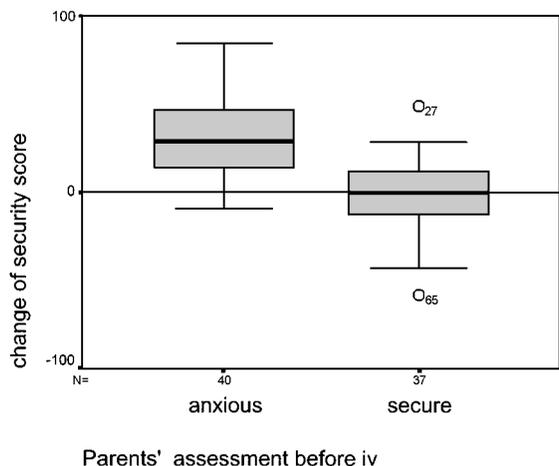


Fig. 1. Parents' visual analogue scale (VAS) assessments of their child's anxiousness/security. Change 2 wk after *ivl* in relation to assessment before *ivl*. (Box-plot diagram, showing median values and quartiles).

were significantly more alert [$F(1, 50) = 6.7; p = 0.013$], happy [$F(1, 50) = 15.3; p < 0.001$], secure [$F(1, 50) = 11.3; p = 0.001$] and accommodating [$F(1, 50) = 24.2; p < 0.001$] two weeks after *ivl*. A reported improvement in appetite was not significant [$F(1, 50) = 3.7; p < 0.06$] in repeated-measures ANOVA (owing to missing data, including only 51 children). If 74 children were included by analysing appetite scores from before and two weeks after *ivl* only, improvement in appetite would also be significant [$F(1, 73) = 11.8; p = 0.001$], however.

Most children who before the intervention had a VAS score of less than 50, i.e. were assessed as more or less tired, depressed, anxious or obstinate or had a poor appetite, increased their values, whereas there was no change in the mean score for children scoring 50 or more. This is shown as a box-plot diagram for the secure/anxious variable in Fig. 1. The Pearson correlation between the children's security scores before intervention and change after intervention was 0.67 ($p < 0.001$).

Six children were assessed with some certainty as less secure by their parents two weeks after *ivl*, i.e. they scored more than 20 mm lower on the VAS scale for secure/anxious. None of them continued to score less than 20 below the pre-intervention score and three of them ended up with higher scores than before the interventions.

Before intervention, the children studied had significantly lower mean scores on the FISS (indicating less feeling of security) than children from the comparison group [$t(260) = 2.0; p = 0.048$], as shown in Table 4. This difference was eliminated at the 1-mo follow-up. In paired *t*-tests, the increase was significant for both "dependent trust" [$t(69) = 2.1; p = 0.040$] and "self-trust" [$t(69) = 3.1; p = 0.003$] as well as total

Table 4. Flint Infant Security Scale. Mean values before and after interventions (scale -10 to 10).

	N	"Dependent trust" score	"Self-trust" score	Security score
Before <i>ivl</i>	95	3.84 (2.46)	6.96 (1.79)	5.70 (1.79)
After <i>ivl</i>	71	4.48 (2.21)*	7.53 (1.56)**	6.32 (1.52)**
Comparison group	167	4.44 (2.66)	7.43 (2.32)	6.23 (2.20)

Standard deviations within parentheses. Significance refers to comparison with values before *ivl*.

* $p < 0.05$; ** $p < 0.01$.

security score [$t(69) = 2.9; p = 0.005$]. A stricter application of the instrument, excluding children of more than 24 mo of age, yielded significant increases of "self-trust" [$t(58) = 2.2; p = 0.023$] and total security scores [$t(58) = 2.2; p = 0.034$] only.

The lower the total security score before intervention, the greater was its tendency to increase after intervention ($r = 0.63, p < 0.001$). There were no significant score differences between age or gender groups.

After intervention the mean score was higher for 30 of the 35 items, reaching significance in 5 items, most markedly in the scales "Accepts opportunity to try to feed self" versus "Refuses to feed self when expected to do so" [$t(61) = 2.4; p = 0.017$] and "Generally relaxed" versus "Generally tense" [$t(64) = 3.2; p = 0.002$]. None of the mean item scores were significantly lower after intervention.

Parental well-being

On the same occasions, when they registered their impressions of their child's behaviour, both parents also registered their own feelings of well-being on three VAS instruments. Mothers reported feeling more tired ($p < 0.001$), depressed ($p < 0.001$) and discouraged ($p < 0.01$) before the interventions than fathers did. This difference was eliminated as early as two weeks after *ivl*, when both parent groups reported being of better mood, as shown in Table 5. Thus, as a mean, parents reported feeling significantly less tired [$F(1, 51) = 32.4; p < 0.001$ for mothers and $F(1, 48) = 10.6; p = 0.002$ for fathers], less depressed [$F(1, 51) = 21.0; p < 0.001$ and $F(1, 48) = 8.0; p = 0.007$, respectively] and more hopeful [$F(1, 51) = 38.4; p < 0.001$ and $F(1, 48) = 12.3; p = 0.001$, respectively]. The mood improvement was stable over time.

Results from the SPSQ, completed by the mothers before *ivl* and at the 1-mo follow-up, are recorded in Table 6. The sleep programme led to a significant reduction of the mean total SPSQ score [$t(67) = 4.5; p < 0.001$], also when sleep items were excluded [$t(67) = 2.6; p = 0.011$]. The score for the variable "role restriction", representing feelings of restraint and lack of time for oneself, was also significantly reduced with the sleep item excluded [$t(67) = 2.7; p = 0.008$].

Table 5. Parents' assessments of their own well-being. Mean VAS values before and after interventions (scale 0–100).

	Before <i>ivl</i>	Two weeks after <i>ivl</i>	1-mo follow-up	3-mo follow-up
Mothers' registrations				
N	95	78	73	76
Alert–(tired)	27 (21)	51 (24)***	56 (27)	57 (29)
Happy–(depressed)	50 (21)	65 (22)***	70 (20)	70 (20)
Hopeful–(discouraged)	60 (24)	76 (22)***	77 (21)	77 (21)
Fathers' registrations				
N	92	74	69	74
Alert–(tired)	42 (26)	53 (25)**	57 (22)	59 (26)
Happy–(depressed)	62 (20)	68 (17)**	68 (18)	71 (19)
Hopeful–(discouraged)	67 (21)	75 (19)**	73 (18)	75 (20)

VAS: visual analogue scales.
Standard deviations within parentheses.
N = number of mothers or fathers. Significance refers to comparison with the nearest preceding value.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

At the 1-mo follow-up, SPSQ scores were close to scores from Östberg et al.'s comparison sample (20).

Discussion

The two-step behavioural treatment approach used in this study was successful in treating the sleep problems in families with infants or children of up to 4 y of age. At the 1- and 3-mo follow-ups, 92% and 94% of the children, respectively, had fewer signalled night awakenings than before the interventions. The high frequency of common colds that children tend to have during the first years of life was, according to parents' feed-back, probably an important reason for the percentage never rising higher. Sleep diaries were registered irrespective of common colds.

A discussion about probable causes of the positive results concerning the sleep problem itself can be obtained from an earlier publication (18).

An important component of this study was to evaluate the effect of sleep disturbances, and the amelioration of these problems, on family well-being. The number of signalled awakenings that disturbed the parents was therefore of greater interest than short awakenings, not signalled by the child. Consequently, sleep diaries, completed by the parents, were considered appropriate instruments for measuring sleep quality, even if they tend to underestimate the total number of night awakenings. They have been shown to reflect changes in sleep quality as accurately as actigraphic monitoring (22).

The same kind of reasoning is also applicable to the instruments measuring child behaviour and parental well-being. VAS are very subjective instruments of unknown and probably low validity and reliability. They may, nevertheless, be of some interest in a study

Table 6. Mothers' scores on total SPSQ and on subscales before and after interventions. Comparison with Östberg's population-based sample.

	Before <i>ivl</i>	1-mo follow-up	Comparison sample
Total SPSQ score	2.71 (0.62)	2.53 (0.59)***	2.52 (0.56)
Incompetence	2.33 (0.81)	2.22 (0.74)	2.27 (0.68)
Role restriction	3.91 (0.81)	3.48 (0.79)***	3.42 (0.82)
Social isolation	2.06 (0.80)	2.01 (0.77)	2.05 (0.72)
Spouse relationship problems	2.22 (0.98)	2.20 (0.92)	2.25 (0.94)
Health problems	3.02 (0.81)	2.73 (0.89)**	2.61 (0.88)

SPSQ: Swedish Parenthood Stress Questionnaire.
Standard deviations within parentheses. Significance refers to comparison with scores before *ivl*.
** $p < 0.01$, *** $p < 0.001$.

like this. Parental perceptions of their child's behaviour and emotional status, as well as their own, may well have a positive or negative influence on their interaction with the child and thus be important for family well-being and the child's development (23).

The reliability and validity of the two questionnaires used, the FISS and the SPSQ, have been established (19, 20), FISS being used only in children under 24 mo of age, however. Still, the lack of direct observation of child behaviour and parent–child interactions is a methodological limitation of the study.

The group of children studied had significantly lower FISS scores than a comparison group at baseline, but this difference disappeared after the interventions. This was shown whether data from all children were analysed or data from only those aged less than 24 mo. Analysis of all items in the FISS instrument showed no signs of negative emotional or behavioural changes after intervention, but several positive changes.

The VAS scores, measuring parental assessment of their child's feeling of security, also indicated a significant improvement, evident as early as two weeks after the first intervention and stable until the 3-mo follow-up. A significant improvement of the mean score, however, does not rule out that some especially vulnerable children might become more insecure, as claimed by critics of the method. The analysis of the VAS scores, accounted for in the result section, gave no indication that this was the case. There was a strong correlation between improvement and scores before intervention in both VAS and FISS—the more anxious or insecure the child was rated, the more he/she tended to benefit from the intervention. The most plausible explanation for this is that anxious children have had few opportunities to develop self-regulating strategies, as they have parents who are too eager to comfort them in all stressful situations. As shown by Morrell, mothers in families with sleep problems are more likely to have doubts about their parenting competence and more likely to have difficulties in setting limits and resisting the infant's demands (24). As part of this programme

parents are taught why and how they must change their interaction with the child in order to help him/her develop his/her self-regulation (18). Children were already given this opportunity during intervention 1.

After interventions, there was an overall improvement in the children's behaviour, according to parental assessments. Two weeks after *ivI* the children were as a group perceived as significantly more alert, happy, accommodating and having better appetites. As mean night sleep time had also increased significantly, it is probable that the improvement was partly or mostly due to the elimination of a sleep debt. An increased feeling of security may also have influenced behaviour, either directly or indirectly, by way of more effective sleep. Anxiety leads to both shorter and lighter sleep, i.e. a reduced percentage of sleep spent in stage 4 (25). Moreover, infants who have acquired the ability to self-soothe have been found to have a higher percentage of quiet sleep (26).

Also, as a group, mothers and fathers felt significantly more alert, happy and hopeful two weeks after *ivI*, probably because of a reduction of sleep debt, as the improvement was evident as early as two weeks after *ivI*. Another reason was that the mothers' feelings of constraint and lack of time for their own needs were reduced after the interventions, as shown from the SPSQ scores. Total stress score was also significantly reduced. At the 1-mo follow-up all stress scores were very close to a Swedish comparison group of mothers with young children.

An interesting finding is that mothers reported feeling significantly more tired, depressed and discouraged than fathers did before the intervention, but not two weeks later. Sleep problems seem to affect mothers more than fathers, probably because mothers assume more responsibility, and this may be one factor explaining why maternal depression is so common in Western societies (10, 11).

It is very likely that mood improvement made parents more accepting of their children's behaviour and so rated it more favourably after the interventions. Even so, it is indisputable that the interventions resulted in some mood improvement in both the treated children and their parents. As mentioned above, more positive parental perceptions of their children's behaviour may lead to less stressful interactions, breaking the vicious circle of mutual irritability.

Thus, both actual improvements in the children's behaviour and their parents' increased confidence in their children are probably important for the children's future development. There is evidence that infants and children in families with sleep problems are at risk of developing behaviour problems later in life (7, 8). Teaching children to sleep through the night by using the method studied here may decrease this risk.

As the reported improvements in both sleep quality, daytime behaviour and family well-being were evident as early as two weeks after the first standardized

intervention, this study gives no indication that severe family dysfunction is a common cause of sleep problems in families with young children. There may be many reasons why parents have chosen to give their children some form of help to fall asleep (27). This help, however, seems to be the direct cause in practically all cases of long-lasting frequent night awakenings, except those caused by milk allergies or other physical disorders.

In conclusion, this study documents the benefit of a standardized, two-step, behavioural intervention programme for improving both sleep and subjective parental well-being in families with young children and sleep problems. According to parental ratings, the children showed no signs of detrimental effects but many signs of beneficial emotional and behavioural changes after the interventions. In the families with sleep problems, the children were, as a group, parentally rated as more insecure and the mothers under more stress than children and mothers in comparison groups. These differences were eliminated after the interventions.

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