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Instrument development and an intervention to increase parents' self-efficacy regarding their infant's sleep

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ABSTRACT

Objective: Many Swedish parents experience that their infant has sleeping problems. Parents' self-efficacy regarding their infants' sleep may play an important role in how they perceive these problems. This pilot study aimed to develop an instrument measuring parents' self-efficacy regarding their infant's sleep and to examine if parents' self-efficacy was affected by an intervention focusing on parental education.

Method: Mothers and fathers, at a maternity unit in Sweden, were drawn into either an intervention (n = 46) or a control (n = 42) group. The intervention group received a home visit from a nurse who provided information about infant sleep; the importance of attachment; and advice regarding sleep, breastfeeding and bed sharing, including guidelines for safe bed sharing. Three months later, the participants answered questions on background data, breastfeeding, sleep and self-efficacy.

Results: The 11-item two-factor Uppsala Parental Self-Efficacy about Infant Sleep Instrument (UPPSEISI) was constructed to measure parents' perceived self-efficacy. In adjusted analyses, being in the intervention group was associated with a higher self-efficacy (P = 0.035), as were being a mother (P = 0.003) and being satisfied with one's own sleep (P = 0.007), while parents' own sleeping problems were associated with a lower self-efficacy (P = 0.015).

Conclusion: Importantly, parental education may increase parents' self-efficacy regarding their infant's sleep.

Introduction

Infants' nocturnal sleep is a concern for many parents in western settings (as in western, industrial, educated, democratic and rich settings), and European studies show that approximately 30 % of parents experience that their infant has sleeping problems [1]. Expectations of infants' sleep and breastfeeding patterns have changed over time. Up until the 19th century, childcare was directed at the child's needs, and the child's requirements of comfort and physical contact were met both on a conscious and a subconscious level. Bedsharing and frequent breastfeeding for several years were the norm. At the beginning of industrialism and after the breakthrough of asepsis, ideas emerged in western settings, that breastfeeding and infant sleep should be regulated [2]. These ideas still influence views on both sleep and breastfeeding, thoroughly described in a review by McKenna et al. [3], pointing out that sleep and breastfeeding is often treated separately in biomedical research although there is an interrelationship between sleep and infant feeding. Also, Rudzik and Ball show that parental attitudes and practices are based on social norms and the choice to breastfeed or bottle feed affects how the parents view the child's sleep [4].

The infant is lacking circadian rhythm at birth and its sleep development is dependent on sleep ecology and caregiving behaviour such as breastfeeding, since human milk contains melatonin in a circadian rhythm [5]. Nightly awakenings are common during the first year, and infants < 1-year-old wake up, on average, 2—3 times/night [6]. If the infant cannot go back to sleep by comforting him or herself, parents in western settings, often perceive that their infant has a sleeping problem [7]. Parents who feel they cannot manage their infants' sleep have a

Abbreviations: CI, confidence interval; EFA, exploratory factor analysis; GEE, Generalised Estimating Equations; SD, standard deviation; SIDS, sudden infant death syndrome; UPPSEISI, Uppsala Parental Self-Efficacy about Infant Sleep Instrument.

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higher degree of emotional distress [8]. As parents are often concerned about perceived sleeping problems, it is a common reason for seeking help from healthcare. The issue is often discussed during the regular visits at the Child Health Services [9], with the matter being costly for the healthcare system [10]. In many western settings, the infant's perceived sleeping problems lead to a plethora of advice, often with features of controlled crying. Controlled crying is a behaviour intervention method, meaning that the infant, > 6 months, will learn how to comfort him or herself and fall asleep/be quiet, in case of nightly awakenings [11]. Nevertheless, researchers report that the use of this method can be both stressful and inefficient for both parents and infants [12,13]. It may also violate the Convention on the Rights of the Child [14].

Many Swedish parents, both mothers and fathers, share a bed with their infant [15]. Although bed sharing infants have an increased number of awakenings during the night, these awakenings are short and therefore, allow more sleep for the parents [16]. There are both physical and psychological benefits of bed sharing, particularly for the breastfed baby [17,18]. Fathers who bed share have lower testosterone levels and are more involved in the childcare over-all [5]. Mothers who bed share breastfeed longer [15], which is one of the protective factors for the infant to not be affected by sudden infant death syndrome (SIDS) [19]. At the same time, if bed sharing is practiced under hazardous circumstances, it has shown to entail an increased risk of SIDS. Circumstances that have been shown to increase the risk of SIDS are parental smoking or bed sharing on a sofa [20,21]. For that reason, the Swedish National Board of Health and Welfare claims that it is safest for the infant to sleep in the supine position in a separate bed [22]. When following this recommendation, sleep will involve separation from the parents, which might be stressful for the infant and possibly affect the infant's attachment pattern as well as breastfeeding [23]. Moreover, bed sharing infants develop secure attachment to a greater extent than those who do not [24].

Parental self-efficacy regarding their infants' sleep may play an important role in how parents perceive their infant's sleep pattern. Parents reporting higher self-efficacy more often perceive their infant's sleep as less troublesome than parents who report a low self-efficacy regarding their infant's sleep [25]. Parental education focusing on infants' sleeping patterns, feeding patterns and attachment behaviour could increase parents' self-efficacy [26]. For this reason, we have developed an instrument measuring parents' self-efficacy regarding their infants' sleep, aiming to examine whether parents' self-efficacy could be affected by an intervention focusing on parental education.

Aim

The first aim of the present study was to develop and psychometrically test an instrument measuring parents' self-efficacy regarding their infants' sleep. We used a sample of parents who were at 3——4 months postpartum. As a second aim, we were interested in using this instrument and sample to examine if parents' self-efficacy was affected by an intervention focusing on parental education or by parents' demographic and parenting characteristics.

Methods

Ethical approval was waived from the Regional Ethical Review Board in Uppsala (Dnr 2012/374). Participants were recruited during a three-month period in 2012–2013 (November–January) from a maternity ward at a Swedish university hospital, located in a municipality with a population of about 230,000 persons. During data collection, parents of healthy and full-term new-born infants who met the inclusion criteria were informed about and asked to participate in the study by a nurse during their stay at the maternity ward. Pursuant to the Declaration of Helsinki [27], the couples were informed that their participation was voluntary and that they could withdraw from participation at any time. Inclusion criteria were: a) first-time mothers, free from any disease that affected their sleep, b) non-smokers, c) living in the municipality chosen for the study, and d) mastering the Swedish language. Only non-smokers were included because smoking increases the risk of SIDS, and bed-sharing is not recommended for parents who smoke. The inclusion criteria were met by 72 couples. The couples were assigned to either the intervention group or the control group through a random number generator. After discharge from the maternity ward, the parents in the intervention group received a home visit during the first week postpartum from a nurse, who provided oral and written information about behaviour and sleeping pattern of infants; the importance of attachment; and advice regarding sleep, breastfeeding and bed sharing, including guidelines for safe bed sharing (see Appendices 1 and 2). At 3——4 months postpartum, questionnaires requesting information on demographic data, breastfeeding, sleep and self-efficacy were sent by mail to 130 parents to be filled in separately; 96 of these questionnaires were returned after two reminders via text messages. Of the 96 parents included in the study, eight (8.3 %) individuals were excluded due to missing data for the questions about parents' perceived confidence in their abilities to handle their infant's sleep, resulting in a sample size of 88 individuals for the present study.

Self-efficacy

Parents' self-efficacy regarding their infant's sleep was measured with 13 questions, based on Bandura's self-efficacy theory [28]. The answer choices were graded on a five-point Likert scale ranging from 1 (not confident at all) to 5 (very confident) and included questions on breastfeeding and sleep (Table 2). From these 13 questions, the 11-item two-factor Uppsala Parental Self-Efficacy about Infant Sleep Instrument (UPPSEISI) was constructed.

Study variables

Age (years) and Mother (yes/no) were measured by the respondents stating their age and if they were the mother or the father of the infant, respectively, while Living together (yes/no) was measured by asking the respondents if they were married or cohabiting with their partner. Education was measured using three levels: primary school, secondary school or college, and dichotomised as College/University education (yes/no), while occupation before the infant was born was measured using five categories: studying, working, on sick leave, on parental leave and unemployed, which were then dichotomised as Employed (yes/no). Breastfeeding was measured by asking if and how the infant was fed with breastmilk and dichotomised as exclusive breastfeeding (yes/no), while bed sharing was measured by asking if the infant had slept at night in the parent's bed on a daily basis, either sometimes or never during the last week, which was then dichotomised as bed sharing daily (yes/no).

An infant state-regulation index was constructed by asking the respondents if they had experienced problematic behaviour by the infant during the last week regarding: colic, persistent screaming, being difficult to comfort, being difficult to put to sleep, often woke the parent at night, having sleeping problems and or being difficult to feed. Each problematic behaviour was given the score 0 (no problems), 1 (mild problems), 2 (severe problems) or 3 (very severe problems), and the scores were added to give a total Infant state-regulation index score, ranging from 0 to 21 points. Likewise, a Parental sleeping problems/tiredness index was constructed by asking the respondents if they had experienced any of the following problems during the last week: difficulty falling asleep, difficulty falling back to sleep, tiredness, or getting too little sleep. Again, each problem was given the score 0 (no problems), 1 (mild problems), 2 (severe problems) or 3 (very severe problems), with the scores added to give a total Parental sleeping problems/tiredness index, ranging from 0 to 12 points. This was complemented with a Parental sleep satisfaction index, where the respondents were asked to state how satisfied they were with their own sleep from 1 (not

satisfied) to 10 (very satisfied). Finally, the parents were asked in what position the infant was placed when he or she was put to bed (on the back, on the side or on the stomach) and how the infant was put to sleep at night, with the answers dichotomised as Infant only sleeping on his or her back (yes/no) and Infant put to sleep at night only through breast-feeding (yes/no), respectively.

Statistical analyses

Categorical data are presented as frequencies and percentages, n (%), while ordinal, discrete and continuous data are given as means with accompanying standard deviations (SDs). To take into account the dependence between mothers and fathers of the same infant, tests of differences between the intervention and control groups as well as regression analyses were performed using Generalised Estimating Equations (GEE) regression models with independence working correlation structures together with the robust sandwich variance estimator, applying a binominal error distribution and link function when the outcome was dichotomous and a Gaussian error distribution and link function when the outcome was ordinal, discrete or continuous. For tests of differences between the intervention and control groups, unadjusted GEE regression models with intervention (yes/no) as the independent variable was used.

To construct the UPPSEISI instrument, exploratory factor analysis (EFA) was used to elucidate the underlying factor structure of the 13 items/questions related to the parents' perceived confidence in their abilities to handle their infant's sleep. The goal was to achieve a factor solution combining easily interpretable factors with good psychometric properties, defined as all factors having ≥ 3 items with high factor loadings (absolute value > 4 after varimax rotation), and all items having high factor loadings for only one factor [29]. For the EFA analyses, the number of factors to be extracted was determined using the Very Simple Structure (VSS) complexity 2 method [30], with the EFA model estimated using the maximum-likelihood method combined with varimax rotation. In the estimation process, items were removed from the model one at a time if they had no high loadings or had high loadings for > 1 factor, and the model re-estimated until a satisfactory factor solution was obtained fulfilling the above-mentioned criteria.

Adjusted and unadjusted GEE regression models were used to estimate the magnitude of the intervention's influence on parent's UPPSEISI values, as well as the association between parents' demographic and parenting characteristics and their UPPSEISE values. For the adjusted analyses, the modelling was performed by first entering all available variables as independent variables in the model and then consecutively excluding all variables with P-values > 0.20 from the model, starting with the variable with the highest P-value and re-estimating the model before excluding the variable with the highest P-value among the remaining independent variables. This process was repeated until only variables with P-values < 0.20 were included in the model.

All statistical analyses were performed using R $\geq$ 4.2.0 (R Foundation for Statistical Computing, Vienna, Austria), with the GEE models estimated using the R package 'geepack' [31]. For all statistical tests, two-sided P-values < 0.05 were considered statistically significant.

Results

Demographic and clinical characteristics for the 88 participating parents are given in Table 1. The parents had a mean (SD) age of 31.8 (5.2) years, with 45 (51.1 %) of them being mothers, 66 (75 %) having a college/university education, and 74 (84.1 %) being employed before the infant was born. Exclusive breastfeeding was reported by 49 (56.3 %) of the parents at 3——4 months postpartum, while 40 (45.5 %) parents reported daily bed sharing with their infant during the last week. The Infant state-regulation index score showed that, overall, the parents experienced no problematic behaviours or only mild ones from the infant during the last week, with a mean (SD) score of 3.59 (3.21) points out of the possible 0——21 points. Similarly, they reported experiencing no sleeping/tiredness problems or only minor issues, with a mean (SD) score of 2.91 (2.26) points out of the possible 0——12 points, and a high degree of satisfaction with their own sleep, with a mean (SD) score of 6.78 (2.18) points out of the possible 1——10 points. Finally, 69 (79.3 %) parents stated that their infant was tucked in for the night on his or her back. Remaining parents put their infant to sleep on their side. Thirty-five (40.7 %) parents reported that they put their infant to sleep at night only through breastfeeding. Notably, there were no statistically significant differences between the intervention and control groups for any of these variables.

Table 1
Demographic and clinical characteristics of the 88 participating parents.

Variable	All n = 88	Intervention n = 46	Control n = 42	P-value
Age (years), mean (SD)	31.8 (5.2)	31.4 (3.6)	32.3 (6.6)	0.534 [g]
Mothers, n (%)	45 (51.1)	23 (50.0)	22 (52.4)	0.401 [h]
College/university education, n (%)	66 (75.0)	34 (73.9)	32 (76.2)	0.848 [h]
Employed before the infant was born (yes/no), n (%)	74 (84.1)	37 (80.4)	37 (88.1)	0.344 [h]
• Studying, n (%)	8 (9.1)	5 (10.9)	3 (7.1)	
• On sick leave, n (%)	4 (4.5)	2 (4.3)	2 (4.8)	
• On parental leave, n (%)	1 (1.1)	1 (2.2)	0 (0.0)	
• Unemployed, n (%)	1 (1.1)	1 (2.2)	0 (0.0)	
Exclusive breast-feeding, n (%)[1]	49 (56.3)	24 (53.3)	25 (59.5)	0.661 [h]
Bed sharing daily, n (%)	40 (45.5)	26 (56.5)	14 (33.3)	0.068 [h]
Infant state-regulation index (points), mean (SD)[a,1]	3.59 (3.21)	3.98 (3.67)	3.15 (2.57)	0.251 [g]
Parental sleeping problems/ tiredness index (points), mean (SD)[b, 1]	2.91 (2.26)	2.91 (2.26)	2.90 (2.28)	0.990 [g]
Parental sleep satisfaction index (points), mean (SD)[c,1]	6.78 (2.18)	6.80 (2.41)	6.76 (1.94)	0.939 [g]
Infant only sleeping on his/her back, n (%)[1]	69 (79.3)	38 (84.4)	31 (73.8)	0.270 [h]
Infant put to sleep at night only through breast-feeding, n (%)[2]	35 (40.7)	17 (38.6)	18 (42.9)	0.750 [h]
UPPSEISI total score (points), mean (SD)[d]	40.5 (6.6)	41.6 (6.0)	39.3 (7.0)	0.140 [g]
• Arduous Parenting (points), mean (SD)[e]	11.0 (2.6)	11.3 (2.2)	10.6 (2.9)	0.199 [g]
• Child's Need for Sleep (points), mean (SD)[f]	29.5 (5.0)	30.3 (4.8)	28.7 (5.2)	0.197 [g]

Notes: SD, standard deviation. All n = 22 (25.0 %)participants without a college/university education had a secondary school education. All n = 88 (100 %) participants were cohabiting. Possible range of indices: [a] 0–21 points, [b] 0–12 points, [c] 1–10 points, [d] 11–55 points, [e] 3–15 points, and [f] 8–40 points. P-values from GEE regression models using [g] a Gaussian and [h] a binomial error distribution and link function. [n] Number of missing observations.

Development and psychometric testing of the Uppsala Parental Self-Efficacy about infant sleep instrument

Results for the EFA are given in Table 2. After consecutively excluding item #8 (I can always put my child to sleep at night in a way that is satisfactory for the child) due to not having any high factor loadings, and item #10 (I can always make sure I get the sleep I need) due to having high loadings for > 1 factor, a satisfactory two-factor solution was obtained: the 11-item Uppsala Parental Self-Efficacy about Infant Sleep Instrument (UPPSEISI), with total scores ranging from 11 to 55 points. Higher values on UPPSEISI indicate a higher level of parental self-efficacy.

Two distinct domains were identified: The Child's Need for Sleep (CNS) domain (8 items), measuring the parents' self-efficacy regarding

Table 2
Results from exploratory factor analysis (EFA) of the 13 questions related to the parents' perceived confidence in their abilities to handle their infant's sleep, resulting in the 11-item two-factor Uppsala Parental Self-Efficacy about Infant Sleep Instrument (UPPSEISI).

#	Question	Mean (SD)	Domain	Factor 1	Factor 2
	I can always…				
1.	tell when my child needs to sleep	4.0 (0.74)	CNS	**0.643**	0.083
2.	count on my child getting the sleep he or she needs	3.8 (0.85)	CNS	**0.801**	−0.051
3.	cope with my child's sleep as well as I cope with other challenges	3.8 (0.89)	CNS	**0.666**	0.297
4.	get my child to sleep when he or she needs to	3.2 (1.03)	CNS	**0.619**	0.241
5.	make sure my child is calm	3.6 (0.93)	CNS	**0.618**	0.215
6.	deal with the fact that I don't get the sleep I need	3.5 (1.05)	AP	0.226	**0.816**
7.	put my child to sleep at night in a way that is satisfactory to me	3.6 (0.98)	CNS	**0.478**	0.313
8.	put my child to sleep at night in a way that is satisfactory for the child	3.8 (0.99)	*Not in model*		
9.	deal with the fact that putting my child to sleep at night can take a lot of time	3.9 (0.94)	AP	0.385	**0.664**
10.	make sure I get the sleep I need	3.1 (1.00)	*Not in model*		
11.	manage to fulfil my child's sleep needs	3.9 (0.75)	CNS	**0.796**	0.124
12.	count on my child to fall asleep when he or she needs to	3.6 (0.85)	CNS	**0.530**	0.300
13.	go back to sleep after being woken up	3.6 (1.21)	AP	−0.008	**0.529**

Notes: AP, Arduous Parenting; CNS, Child's Need for Sleep; SD, standard deviation

handling challenges related to the child getting enough sleep at the right time, and the Arduous Parenting (AP) domain (3 items), measuring the parents' self-efficacy regarding handling the challenges posed by practicalities in getting the child to sleep and the parent's own disturbed sleep. The CNS domain (8——40 points) included items 1——5, 7, and 11——12, with the questions covering the parents' confidence regarding being able to tell when the child needs to sleep, counting on the child getting the sleep he or she needs, coping with the child's sleep as well as coping with other challenges, getting the child to sleep when he or she needs to, making sure the child is calm, putting the child to sleep at night in a way that is satisfactory to the parent, managing to fulfil the child's sleep needs, and counting on the child to fall asleep when he or she needs to. The AP domain (3——15 points) included items 6, 9 and 13, with the questions covering the parents' confidence regarding dealing with not getting the sleep they need, the fact that putting the child to sleep at night can take a lot of time, and one's ability to always fall back to sleep after being woken up. Higher values on the CNS and AP domains indicate higher levels of parental self-efficacy regarding handling challenges related to the child getting enough sleep at the right time and handling the challenges posed by practicalities in getting the child to sleep and the parent's own disturbed sleep, respectively.

Parents' self-efficacy following the intervention

Results from the GEE regression models for predicting parents' UPPSEISI scores are provided in Table 3. In the unadjusted analyses, only four variables were significantly associated with parents' UPPSEISI scores: being a mother implied 2.50 points higher self-efficacy compared with being a father, as measured using the UPPSEISI index (P = 0.028), while each additional point on the Infant state-regulation and the

Table 3
Results from the Generalised Estimating Equations (GEE) regression models for predicting parents' UPPSEISI scores.

	Unadjusted		Adjusted	
Variable	β (95 % CI)	P-value	β (95 % CI)	P-value
Intervention	2.26 (-0.74 to 5.25)	0.140	2.35 (0.17 to 4.53)	**0.035**
Age (years)	−0.21 (-0.51 to 0.10)	0.192	*Not in model*	
Mother	2.50 (0.27 to 4.73)	**0.028**	3.14 (1.06 to 5.21)	**0.003**
College/university education	−2.68 (-6.06 to 0.70)	0.120	−2.03 (-4.45 to 0.39)	0.100
Employed before the infant was born	1.77 (-1.29 to 4.83)	0.257	*Not in model*	
Exclusive breast-feeding	0.63 (-2.61 to 3.88)	0.659	1.80 (-0.24 to 3.84)	0.083
Bed sharing daily	−0.76 (-3.12 to 1.61)	0.529	*Not in model*	
Infant state-regulation index (points)[a]	−0.68 (-1.13 to −0.23)	**0.003**	*Not in model*	
Parental sleeping problems/ tiredness index (points)[b]	−1.44 (-1.87 to −1.01)	**< 0.001**	−0.73 (-1.31 to −0.14)	**0.015**
Parental sleep satisfaction index (points)[c]	1.56 (0.93 to 2.20)	**< 0.001**	0.97 (0.27 to 1.68)	**0.007**
Infant only sleeping on his or her back	1.56 (-2.24 to 5.36)	0.374	*Not in model*	
Infant put to sleep at night only through breastfeeding	−1.04 (-3.89 to 1.81)	0.475	−1.39 (-3.40 to 0.63)	0.177

Notes: CI, confidence interval. Significant P-values are given in **bold**. Possible range of indices: [a] 0–21 points, [b] 0–12 points, and [c] 1–10 points.

Parental sleeping problems/tiredness index resulted in 0.68 (P = 0.003) and 1.44 (P < 0.001) points lower self-efficacy, respectively. For the parental sleep satisfaction index, each additional point was associated with 1.56 points higher self-efficacy (P < 0.001). Notably, intervention was not significant in the unadjusted analyses.

In the adjusted analyses, the five variables: Infant state-regulation index, Bed sharing daily, Age, Infant only sleeping on his or her back, and Employed before the infant was born, were consecutively excluded until only variables with P-values < 0.20 were included in the model. For this final model, intervention was found to be significantly associated with parents' self-efficacy, with those in the intervention group having, on average, 2.35 points higher UPPSEISI scores compared with those in the control group (P = 0.035). Of the remaining variables, being a mother was still statistically significant, with 3.14 points higher self-efficacy compared with being a father (P = 0.003), as were the Parental sleeping problems/tiredness index, with 0.73 points lower self-efficacy for each additional point on the index (P = 0.015), and the Parental sleep satisfaction index, with 0.97 points higher self-efficacy for each additional point on the index (P = 0.007). No other variables were statistically significant in the adjusted analyses.

Discussion

The present study describes an intervention, including a home visit with both oral and written information about infants' behaviour and sleep pattern. Parents were informed about the importance of an infant's attachment and received advice regarding sleep, breastfeeding and bed sharing, including guidelines for safe bed sharing. A regression analysis showed that the parents who took part in the intervention had a higher self-efficacy regarding their infant's sleep than parents who were not included in the intervention group. Moreover, mothers had higher self-efficacy than fathers. The regression analyses also showed that parents having more sleeping problems and lower satisfaction with their own sleep had lower self-efficacy regarding their infant's sleep.

Results in perspective

McKenna et al. describe the cultural change that has taken place in western societies where an individualistic approach has been praised, leading to separation between the mother and infant and an early introduction of formula, and thereby neglecting the interrelationship of sleep contact and breastfeeding [3]. For breastfeeding mothers and their infants, adhering to safe sleep guidelines that discourage bedsharing can be extremely challenging [4].

Not sleeping through the night is normal behaviour for an infant [6], but it is often perceived by parents as the infant having sleeping problems [7]. With knowledge about an infant's behaviour, sleeping pattern and breastfeeding, parents' self-efficacy regarding their infant's sleep was shown to be enhanced in the present study, suggesting that the information given could be a way to increase self-efficacy among parents.

Several researchers have argued that monophasic sleep (one sleep period/day) is a construct of the modern, western culture, enhancing productivity in the society [21,32]. It has been argued that, in pre-industrial societies, both adults and children were polyphasic sleepers, and slept on several occasions during the 24 h circle [32]. The infant's polyphasic sleep may thus be seen as an innate behaviour that clashes with the modern society's sleeping norm. This theory, called the *segmented sleep theory*, proposes that many sleep problems could be solved simply by understanding that eight-hour sleep may be unnatural and, from a historical point of view, very unusual [33].

Having knowledge and realistic expectations on infants' sleep are important factors that can affect the parents' experience of sleep and fatigue [25]. Since most of the advice from the healthcare regarding children's sleep is based on creating time scheduled routines, it is likely that many parents expect infants to be more or less easily controlled with different sleeping arrangements, such as controlled crying [11]. Furthermore, western societal and cultural norms uphold the idea that good parents should get their infant to sleep by him or herself. An infant who can fall asleep alone and self-soothe without fussing is then perceived as a well-behaved infant [12]. In contrast, the Attachment Theory states that it is central that the parents are sensitive to the child's signals in order for the child to develop a secure attachment [34,35]. The infant needs to be in close physical contact with his or her caretakers and be able to call for attention at all times [36]. The night is a particularly sensitive period [37]. When bed sharing, attachment and breastfeeding are enhanced [24], it may also affect the self-efficacy regarding the infant's sleep. This could be an explanation for the results of the present study, namely that mothers had higher self-efficacy than fathers.

New fathers' parental self-efficacy has been described as affected by the co-parenting relationship with the infant's mother [38] and bed sharing fathers are more involved in taking care of the infant [5]. Hence, it could be of importance to make sure that information about sleep is given to and shared between the parents.

Noteworthy, compared with the control group, a higher proportion of parents in the intervention group shared the bed with their infants, which is possibly driven by the intervention. Bedsharing gives the infant proximity to his or her parents and has been shown to promote both attachment [24] and breastfeeding [17]. Breastfeeding is associated with decreasing the risk of SIDS, necrotizing enterocolitis and neonatal infections, and providing benefits for the mother, e.g. by reducing the prevalence of breast cancer and ovarian cancer as well as cardiovascular diseases [39]. By sleeping close to her, the infant has greater access to the breast, while the mother can more easily monitor her baby. Moreover, enhancing parents' self-efficacy regarding their infant's sleep may be crucial in preventing depressive symptoms, since sleep satisfaction is known to be an important factor for well-being [8]. Our results also showed that parents with more sleeping problems and less satisfaction with their own sleep had lower self-efficacy regarding their infant's sleep. Sleep is essential for one's well-being, and by improving the perception and quality of sleep, the attachment-bonding is affected positively [40]. Well-attached infants sleep more, with fewer awakenings [41].

Another important finding from the present study was that no participating parents, bed sharing or not, were putting the infant to sleep in a prone position. Supine sleeping position is the most important factor in decreasing the risk of SIDS [20]. However, some parents (8 in the intervention group and 11 in the control group) stated that they put their infants to sleep on their side when tucking them in for the night, which may also be a risk factor for SIDS [20].

Limitations

The inclusion criteria excluded parents who did not master the Swedish language, which may have biased the results somewhat and limited the generalisability of the conclusions. Furthermore, the study took place in a university city, leading to the included parents having a high educational level, thus limiting the generalisability of the results to the general population. A further limitation was the small sample size; the study may therefore be considered a pilot study to further test the information material that has been developed using a larger randomised intervention. The present study was part of a larger project, *The Breastfeeding Study* [42], where data is processed continuously according to ability. The data, analysed for the present study, were collected between 2012 and 2013 and we cannot rule out the possibility that parents of today would have responded differently. Nevertheless, the Swedish National Board of Health and Welfare has not changed the recommendation on infant's sleep during the past decade and therefore we found it important to share the collected data even if it is dated. Another limitation is the lack of baseline data, only making it possible to see differences between groups, not within groups. Further research is needed to distinguish this issue. Additionally, a longitudinal study could provide more insight into perceptions of sleep over time. In the present study, both mothers and fathers were included. It is of importance to consider mother's and father's non-independence [25]. It is possible that the couples answered the questionnaire together, although the intention was to collect individual responses. Nevertheless, it is important to address fathers, since their perceptions strongly affect practice. Having a supportive partner is one of the factors that increases a mother's self-efficacy and is associated with successful breastfeeding [43].

Implications for practice

Parents' self-efficacy regarding their infants' sleep is a manageable factor that could positively affect how parents perceive their own and their infant's sleep. Parental education about infant behaviour and sleeping pattern; the importance of attachment; and advice regarding sleep, breastfeeding and bed sharing, including guidelines for safe bed sharing, increase parents' self-efficacy.

Conclusions

The education, which was given in both oral and written form by a nurse at a home visit, increased the parents' self-efficacy regarding their infant's sleep. This is an important finding, as increased self-efficacy could have a positive impact on the parent-infant relationship. Fathers and parents with their own sleeping problems had lower self-efficacy regarding their infants' sleep, suggesting that future interventions can be improved to increase self-efficacy in these groups.

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Declaration of competing interest

The authors declare that they have no known competing financial

interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.srhc.2023.100944.

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