Where might my baby sleep? Design and evaluation of a novel discussion tool for parent education

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Abstract

Public health education commonly favours the 'single, simple, message' approach for delivery of key campaigns. This may be inappropriate where issues are complex, or individual circumstances necessitate more tailored information. We addressed the issue of infant safe sleep education, particularly with regard to parent-infant bed-sharing and risk of SIDS and accidental death--a topic which has often been the focus of single-message campaigns. The aim was to evaluate whether a more complex message would be understood and remembered by mothers. A leaflet-based tool was designed which addressed common infant sleep locations, with information on their risks and benefits. Novel components involved the inclusion of information regarding bed-sharing benefits, and a checklist that parents could use to assess their own risk. We found that the leaflet, , when delivered by appropriately trained staff, is effective for enabling discussions with pregnant women that increase their knowledge surrounding the risks and benefits of infant sleep locations.

Key words/terms

SIDS reduction; safe sleep education; bed-sharing; co-sleeping; breastfeeding

Introduction

Safe infant sleep educational interventions aim to reduce the prevalence of unexpected infant deaths, both accidental and unexplained (Sudden Infant Death

Syndrome/SIDS). Information regarding how and where babies sleep has featured prominently in this guidance, with advice regarding infant sleep position (supine, face up) playing a particularly important role in reducing SIDS around the end of the 20th century (see Mitchell, 2009). As parents increasingly adopted the safe sleep guidance on how to position their babies for sleep (supine, feet-to-foot, without bumpers, toys or loose covers) attention shifted to where babies sleep, and the possible opportunities to reduce SIDS further by modifying infant sleep locations (e.g. Scheers et al., 2003). Sleeping in a room alone, in the parents' room, and sharing a sleep surface with another individual, came under the spotlight over the course of the last 10-15 years, but research has produced conflicting results, and guidance to parents has therefore been inconsistent. Even where message consistency has been attempted, the uptake of sleep location messages has been poorer than previous uptake of sleep position messages (Ball &Volpe, 2012). This project trialled a new approach involving individualised discussions around safety and infant sleep location and assessed the retention of this information between pregnancy and new motherhood.

Background

Case control studies have reported associations between both sleeping in a room alone and parent infant bed-sharing (defined as a parent and infant sharing an adult bed for sleep) and the incidence of sudden infant death (Scragg et al., 1996; Blair et al., 1999; Carpenter et al., 2004; Tappin et al., 2005; Blair et al., 2006; Blair et al., 2009). Compared to the standard recommendation of room-sharing (baby in a crib in the parental room) the chance of SIDS increases 2- to 4-fold with bed-sharing for UK babies aged under 3 months. The most recent meta-analysis found that bed-sharing was associated with an estimated annual increase in SIDS, for low-risk babies (breastfed, no smoking or alcohol) from 1/10,000 to 2/10,000 (Carpenter et al., 2013). In comparison, the combination of smoking or alcohol consumption with bed-sharing exponentially increases the risk of SIDS (e.g. when parents smoke, the risk of bed-sharing increases 20-fold; when they also consume alcohol, the risk increases 150-fold) (ibid.). The relationship between parental drug use and bed-sharing with SIDS is difficult to study, but the limited amount of data available suggest the risk is at least that associated with alcohol and bed-sharing, and possibly greater (Blair et al., 2009; Carpenter et al., 2013).

Bed-sharing has also been associated with beneficial outcomes, including more frequent night-time breastfeeding, more months of breastfeeding, and improved ease of night-time care (Ball, 2002; McCoy et al., 2004; McKenna & Volpe, 2007; Kendall–Tackett et al., 2010; Ball et al., 2011; Ward, 2014). The risks and benefits of bed-sharing are therefore largely dependent on contextual factors (Blabey & Gessner, 2009; Blair et al., 2014; Fetherstone & Leach, 2012) making a universal recommendation inappropriate and potentially harmful to low-risk individuals (Ball & Volpe, 2013). Similarly, some parents perceive benefits associated with having their babies sleep alone, including attempts to encourage self-soothing and settling alone, reduced disturbance of parental sleep, and making use of a nursery.

In taking an authoritative public health approach (Beattie, 1991) most prominent strategies implemented to reduce SIDS have focused on simple do's and don'ts (don't put baby prone, keep head uncovered, etc). In the same vein, 'don't bed-share' messaging was disseminated via information campaigns (e.g. posters and pamphlets) that recommended against bed-sharing either universally, or in specific circumstances. In so doing, campaigns have conveyed a message focussed on the elimination of key practices thought to be linked with SIDS (smoking, bed-sharing etc). This mass-marketing approach with simple authoritative messages mirroring road safety and anti-smoking campaigns became popular for delivering sleep location messages in the late 2000s. Extreme examples of this strategy include depicting mothers' bodies as meat cleavers, or bed headboards as tombstones, where more subtle campaigns have employed fairytales or nursery rhymes to convey the same message. In contrast, another approach involving risk reduction (rather than risk elimination) has been implemented in other contexts (as with safer sex, safer formula use, or clean needle campaigns). The former campaigns provide no information about the reasons why parents might bed-share, the benefits associated with bed-sharing, or how to reduce the risks of the bed-sharing environment. This strategy deprives parents of important safety information, should they bed-share deliberately or accidentally. Despite advice against bed-sharing throughout the first decade of 21st century, studies have consistently found that 50% of all babies, and over 70% of breastfed babies in the UK had slept in an adult bed with one or both parent(s) either deliberately or accidentally, by the time they were 3 months old (Ball, 2002; Ball, 2003, Blair & Ball, 2004, Infant Feeding Survey, 2010).

Recent commentators have suggested that current approaches fail to recognise the complexity of the evidence surrounding bed-sharing, and identify ethical issues relevant to both parents and health professionals associated with failing to provide a more nuanced educational strategy, which caters for both low and high-risk families (Fetherston & Leach, 2012; Ball & Volpe, 2013; Gaydos et al., 2014). In recognition that inflexible, authoritative approaches are ineffective in reducing SIDS and SUDI further, negotiated and participatory approaches are gaining favour (Ward, 2014; Gaydos et al., 2014). Such approaches facilitate provision of more nuanced information, and enable parents to consider how they may balance competing needs when making decisions about how to care for their baby at night (Tully & Ball, 2013; Russell, Volpe & Ball, *in press*).

Although sleep safety campaigns are employed by health-care trusts, councils and safeguarding boards, their effectiveness in terms of parent knowledge of risk reduction has been rarely evaluated. Where recipient and user satisfaction have been evaluated, outcomes have been poor (Evans & Robinson, 2012; Dodd, 2012)

In 2007, the WHO/UNICEF Baby Friendly Initiative was implemented by Primary Care Trusts in NHS Blackpool and NHS North Lancashire. A key principle of the BFI programme is that, "All mothers are given full information about the benefits and risks of, and contraindications to, bed-sharing" [UNICEF, no date]. However, many health professionals reported that they felt unprepared for discussing infant sleep locations with mothers and pregnant women, and providing safe sleep location information. This paper reports on an education initiative based in North-West England that aimed to address this need as a service delivery evaluation.

Methods

The Tool

Researchers from Durham University worked in partnership with health professionals in NHS Blackpool and North Lancashire to develop an infant sleep education tool called 'Where will my baby sleep?' This was an illustrated 8 page booklet designed to help health professionals engage in discussion with parents about the risks and benefits associated with different infant sleep locations, and to help parents conduct an individual risk assessment for common sleep scenarios.

The tool was designed to be visually appealing using cartoon images and short passages of text (See Appendix 1).

Information was presented in a question and answer format that sought to engage expectant mothers/parents in discussion about relevant sleep locations (room alone, parental room, bedsharing, sofa or armchair sharing). Only one strict item of guidance was provided (to never sleep with a baby on a sofa or armchair) as at the time of publication of the leaflet, this was considered the greatest risk to infants both in terms of SIDS and accidental deaths (see below). The centre page of the tool contained a bed-sharing checklist which listed factors associated with SIDS/SUDI while bed-sharing, and prompted participants to question their own circumstances with relation to these risk factors. Also listed were the reasons why each factor affected infant sleep safety, in terms of increased SIDS or accidental SUDI, as well as an indicator of the strength of evidence.

Approval process

As this work was commissioned by NHS Blackpool and NHS North Lancashire as a service delivery evaluation, the local NHS research ethics advisory board determined that its approval was not required.

Approval for use of the tool was made contingent upon the inclusion of the directive to, 'Never sleep with baby on a sofa' by the local Safeguarding Board.

Implementation

The leaflet was distributed antenatally by community midwives to all mothers attending scheduled 34-week appointments, and ad hoc to attendees at hospital clinics, during late 2011 and 2012. All staff tasked with implementing the evaluation (community midwives and peer supporters) received one-to-one training (from MW) together with an information pack containing background information on bed-sharing research evidence; an implementation guide, including a key points sheet (see Appendix 2); and information regarding the aims of the Service Evaluation.

Staff were asked to explain the leaflet to mothers and use it to prompt discussion about infant sleep location. As a minimum, staff were asked to talk women through the structure of the leaflet, and demonstrate how to use the self-screening checklist;

to note that bed-sharing is a common occurrence, especially among breastfeeding mothers and babies, and that it happens both intentionally with planning, and unintentionally; to point out the pros and cons of bed-sharing and guidance relating to how to make bed-sharing safer; to make the point that circumstances can change from day-to-day; women should reconsider their risk factors as needed; to say the leaflet is to take away, and reused as a tool to refer to both before and after their baby is born; and to place a sticker on the mother's notes to show the leaflet had been given to the mother and discussed.

Evaluation

The evaluation was conducted using a pre-test post-test design. Pre-intervention data were collected of mothers' infant sleep safety and location knowledge at Blackpool Infirmary post-natal ward from July to November 2010. Post-intervention data collection of mothers' infant sleep safety and location knowledge were conducted in the same setting 18 months later from February to August 2012. Mothers were approached opportunistically while on the postnatal ward of the Blackpool Victoria Infirmary by trained staff (peer supporters) and asked to complete an infant sleep safety questionnaire. In the pre-test phase, all women present on the ward were approached during designated time periods (based on staff availability to give out the questionnaire). Post-intervention participants were similarly recruited by targeting all those present on the ward who had received the tool antenatally (identified via the sticker placed on their patient care notes).

Results

Completed questionnaires were obtained from 173 pre-test and 97 post-test respondents. Responses, predominantly in the form of binary data and likert scales, were coded into SPSS, and data were analysed using descriptive statistics and the chi-square test. To avoid problems associated with small categories some data were re-coded prior to analysis. Where assumptions for Chi-square were not met, Fisher's exact test was used.

The mean age of respondents in both groups was 28 years. Respondents were overwhelmingly White (82.7% in the pre-test group, 85.6% post-test). Although there were no statistically significant differences between the groups, post-test

respondents were slightly more likely to have a university education (24.8% vs 20.3%, p=.762); have a household income of £40k plus (17.5% vs 15.6%, p=.883); and be married or living with a partner (81.4% vs 72.3%, p=.085).

Cot sleep & safety

Questions relating to SIDS and safety risks associated with infants sleeping in a cot indicated that pre-test respondents were well informed that it was unsafe for a baby to sleep on its front; to have pillows or soft toys in the cot; or to have excess clothes or bedding. Post-test responders had significantly greater awareness of the risk associated with locating the baby's cot in a separate room, and smoking in pregnancy (see Table 1).

- - insert Table 1 here - -

Sleep sharing & safety

Regarding potential risks associated with sharing a sleep surface with an adult, post-test participants displayed greater understanding of the relevance of bed-sharing safety guidance. A greater proportion were aware of the association between SIDS and bed-sharing with smoking in pregnancy; alcohol consumption; consumption of drugs or medication; sofa sharing; parental tiredness; never breastfeeding; and infant prematurity (see Table 2).

- - insert Table 2 here - -

Sleep location

Pre-test respondents were well informed that it was safe for a newborn baby to sleep in the parents' room, and unsafe for a baby to sleep with a parent on a chair or sofa, or to sleep on an adult bed alone. Questions relating to sleeping in a room alone, in bed with a parent, or in a room with another child produced inconsistent responses. Knowledge of safe infant sleep location was significantly greater in the post-test group regarding the risks associated with placing newborn babies in a room alone for sleep. A greater proportion of post-test respondents were also aware that sleep environments lacking an adult presence (such as sharing a room with a sibling) increased infant risk, although the difference in responses did not reach

statistical significance. Assessments of whether different sleep locations were acceptable for newborns when appropriate safety guidelines were followed revealed greater awareness of safety issues regarding both lack of adult presence and bed-sharing (see Table 3)

- - insert Table 3 here - -

Benefits and prevalence of bed-sharing

A greater proportion of mothers in the post-test group were aware of reasons for bed-sharing; the prevalence of bed-sharing; and that bed-sharing may happen both accidentally and deliberately (see Tables 4-6)

- - insert Tables 4-6 here - -

Discussion

The responses of mothers captured following the birth of their baby suggest that the 'Where might my baby sleep?' educational intervention, when delivered by appropriately trained staff, is an effective tool for facilitating discussions of safe sleep with pregnant women and increasing their knowledge of risks and benefits of different infant sleep locations.

Knowledge of bed-sharing was greater in the intervention group. Importantly, knowledge that bed-sharing is common in UK with around 50 percent of babies bed-sharing by 3 months, and that this happens both accidentally as well as deliberately, was also greater. This awareness is important as many parents do not plan antenatally to bed-share, but postnatally find themselves bed-sharing unintentionally, or in an unplanned way, without considering the safety of the bed-sharing environment in advance (Ball et al., 1999, Hooker et al., 2000). Knowledge of both benefits of, and contraindications to, bed-sharing was also improved; however, results indicate that mothers lacked an understanding of the distinction between factors related to SIDS and those associated with accidental death. Educating women about this distinction was not one of the aims this project, however.

The tool was viewed favourably by the recipients, and by staff involved in delivering the tool. Positive feedback was received during, and following, the implementation phase from local peer supporters and Health Visitors:

“There was a great deal of very positive feedback from Star Buddy peer supporters and Health Visitors – to such an extent that people hoard their copies and can’t understand why they can’t use them [post-intervention]!!!” (Health Professional, pers. comm.)

“The feedback I had was positive, the parents liked the look and layout of the booklet. They also liked the idea of being able to read it, put it down then go back to it. I think there is lots of information to absorb and this was well presented.

Limitations

A major limitation affecting this study was the relatively long period separating pre- and post-test data collection. This occurred due to an increase in rapid discharge of women from the maternity unit during the course of the project. Although a dedicated, funded, peer supporter was used to check patient notes for project stickers, and to administer the questionnaire, many women who received the tool antenatally were missed in the post-test phase due to a short (6-hour) discharge. Potentially therefore, factors external to the project may have had an opportunity to influence participants’ knowledge about infant sleep safety during the course of the project; however, we are not aware of any local or national campaigns or events occurring during the relevant time period which may have had this effect.

Due to lack of resources we were unable to assess the fidelity with which the intervention protocol was followed by staff delivering the tool, or provide refresher training or coaching to these staff regarding questions arising during discussions with mothers. The addition of refresher training and coaching would be an important improvement for future development of this tool. We were also unable to assess whether the time constraints of the antenatal appointment affected staff’s ability to fully discuss the tool with mothers.

While our pre and post-test groups did not differ significantly demographically, there was a trend toward higher income and education levels in the post-test group, which may have had some impact on the outcome of the evaluation. An important consideration for future work is to ensure that materials are developed and tested with a focus on mothers whose babies are at increased risk of SIDS, and lower socio-economic groups.

Implications and conclusions

Evaluation of the 'Where will my baby sleep?' tool and delivery strategy indicates that maternal knowledge of detailed contextual information regarding risks and benefits associated with infant sleep location can be improved via an educational tool, delivered during routine antenatal appointments. This suggests that such interventions are viable alternatives to universally deployed instructional campaigns. Mothers are capable of understanding and retaining relatively detailed information about alternate sleep locations and risk factors when this is delivered in an appropriate manner during healthcare interactions. Further research is now needed to evaluate whether this knowledge is implemented in the home.

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Table 1: Risk factors for SIDS in crib/cot (n/%)

A number of factors can increase a baby's risk of Sudden Infant Death Syndrome (SIDS) when they sleep in a cot. What are these?	Pre-test	Post-test	P value*
Baby sleeping on its front	140 (82)	84 (88)	0.19
Being in a separate room from parents	53 (31)	66 (69)	**0.00**
Having a pillow or soft toy in the cot	139 (82)	85 (89)	0.10
Having a mother who smoked during pregnancy	117 (69)	78 (82)	**0.02**
Being cared for by someone who smokes	122 (72)	73 (77)	0.37
Baby has not ever been breastfed	16 (9)	17 (18)	0.05
Sleeping with a dummy	15 (9)	13 (14)	0.22
Overwrapping (excess clothing or bedding)	151 (89)	82 (86)	0.55
*p Value from $\chi 2$ / Fisher's exact test			

Table 2: Factors associated with bedsharing-related SIDS/SUDI (n/%)

A number of factors could make bed-sharing particularly dangerous for babies, in terms of an increased risk of SIDS. What are these?	Pre-test	Post-test	P value*
Parent(s) smoking, even if not in the same room as baby	127 (85)	78 (84)	0.29
Having a mother who smoked during pregnancy	112 (69)	79 (85)	**0.01**
Consumption of alcohol by parent(s)	49 (30)	53 (57)	**0.00**
Consumption of medication or drugs which make parent(s) sleepy	43 (27)	40 (43)	**0.01**
Parent(s) excessively tired e.g. Less than 4 hours sleep in last 24 hours	29 (18)	29 (31)	**0.02**
Baby born early (less than 37 weeks)	73 (45)	56 (60)	**0.02**
Baby born small (less than 5 1/2 lb or 2.5 kg	69 (43)	48 (52)	0.16
Mum has not ever breastfed	21 (13)	28 (30)	**0.00**
Sleeping with baby on a sofa or in an armchair	54 (33)	42 (45)	0.06
A number of factors could make bed-sharing particularly dangerous for babies, in terms of an increased risk of accidental death. What are these?	Pre-test	Post-test	P value*
Parent(s) smoking, even if not in the same room as baby	37 (23)	34 (36)	**0.02**
Having a mother who smoked during pregnancy	23 (14)	28 (29)	**0.00**
Consumption of alcohol by parent(s)	107 (66)	68 (72)	0.30
Consumption of medication or drugs which make parent(s) sleepy	107 (66)	72 (77)	0.08
Parent(s) excessively tired e.g. Less than 4 hours sleep in last 24 hours	104 (64)	59 (63)	0.82
Baby born early (less than 37 weeks)	22 (14)	19 (20)	0.16
Baby born small (less than 5 1/2 lb or 2.5 kg	23 (14)	15 (16)	0.70
Mum has not ever breastfed	8 (5)	11 (12)	0.05
Sleeping with baby on a sofa or in an armchair	114 (70)	75 (80)	0.10
Using sheets and blankets for bedding	46 (28)	31 (33)	0.41
*p Value from $\chi 2$ / Fisher's exact test			

Table 3: Safety of alternate sleep locations (n/%)

Please rate the safety of these places for a newborn baby to sleep. (1=least safe; 5=most safe)**	Pre-test 'Safe'	Post-test 'Safe'	P value*
In a crib or cot in the parents' room	169 (98)	90 (97)	0.47
In a room on their own	33 (21)	8 (10)	**0.03**
On a sofa or chair with a parent who is asleep	1 (1)	1 (1)	0.58
In bed with parent(s)	9 (6)	5 (6)	0.56
In a room with a sibling/other child	16 (10)	4 (5)	0.16
On an adult bed alone	3 (2)	2 (2)	0.56
**responses 1-3 recoded into 'Not safe'; 4-5 into 'Safe'			
Where do you think it is OK for a newborn baby to sleep. (Always OK, If safety guidance is followed, Never OK)**	Pre-test 'OK'	Post-test 'OK'	P value*
In a crib or cot in the parents' room	171 (100)	95 (99)	0.36
In a room on their own	135 (81)	51 (57)	**0.00**
On a sofa or chair with a parent who is asleep	11 (7)	3 (3)	0.20
In bed with parent(s)	42 (25)	48 (53)	**0.00**
In a room with a sibling/other child	104 (63)	31 (35)	**0.00**
On an adult bed alone	16 (10)	4 (4)	0.14
*p Value from $\chi 2$ / Fisher's exact test **'Always OK' and 'If safety guidance is followed' responses recoded into 'OK'; 'Never OK' recoded into 'Not OK'			

Table 4: Knowledge of bed-sharing benefits (n/%)

Do you think there are any benefits or good reasons why a baby might sleep in bed with its mother or parents?	Pre-test 'agree'	Post-test 'agree'	P value*
There are no benefits	88 (51)	40 (41)	0.11
Breastfeeding is easier	54 (32)	52 (54)	**0.00**
Mum sleeps better	20 (12)	17 (18)	0.18
Baby settles and/or sleeps better	45 (26)	27 (28)	0.79
Reassuring for mum and/or baby if baby is unwell, teething etc	39 (23)	34 (35)	**0.03**
Allows mum and/or dad and baby to bond	31 (18)	22 (23)	0.37
Mum continues breastfeeding for longer	26 (15)	27 (28)	**0.01**
*p Value from $\chi 2$ / Fisher's exact test			

Table 5: Bed-sharing prevalence (n/%)

Approximately what % of all UK babies do you think have slept in bed (bed-shared) with their parent(s) by the time they are 3 months old?**	Pre-test 'Accurate estimate'	Post-test 'Accurate estimate'	P value*
*p Value from $\chi 2$ test **Responses recoded so estimates of 50% plus = 'accurate estimate'	99 (59)	69 (78)	**0.02**

Table 6: Bed-sharing intentionality (n/%)

Do you think parents sleep with their babies accidentally, deliberately or both?	Pre-test 'accident'	Pre-test 'deliberate'	Pre-test 'both'	P value*
	34 (20)	7 (4)	128 (76)	
	Post-test 'accident'	Post-test 'deliberate'	Post-test 'both'	
	8 (9)	2 (2)	84 (89)	
*p Value from $\chi 2$ test				**0.03**