

Supplementary material 2: Crying related interventions identified from literature review

Author, date, country	Intervention name and details	Target group and timing of delivery	Research design	Key findings
Altman et al (2011), USA	<p>Parent education programmes re dangers of shaking baby, offering alternative strategies.</p> <p>Designed to be a simple universal education programme to incorporate into hospital routine. Short leaflet and 11 minute video. Parents asked to sign commitment statement to indicate receipt and understanding.</p>	<p>Parents of all newborns, at birth, before discharge.</p> <p>Given separately from other materials to ensure clear message.</p>	<p>Questionnaire feedback from 65,663 parents plus 6 month phone interview with random sample of 320. Comparison of incidence of shaking injuries during 3 years after programme implementation with 5 year historical control period.</p>	<p>84.5% of parents were exposed to programme during the 3 year period, possibly higher as some may not have completed questionnaire. High rates of completion of commitment statement, positive response to video. Some did not watch as had seen for previous birth, broken equipment or already aware of risks. 53.6% agreed to be followed up at 6 months. At 6 months 88.4% remembered receiving information, 97.8% remembered video, 55.6% could think of situations when info had been helpful when infant had been crying a lot. Frequency of cases of shaking injuries decreased from 2.8/yr (14) in 5 years pre-programme to 0.7 (2) during program years – 75% reduction ($p=0.03$). No similar change in surrounding areas.</p>
Bechtel et al (2011), USA	<p>Take 5 Safety Plan for Crying to change beliefs about infant crying and shaken baby syndrome.</p> <p>Simple, to be incorporated into routine practice: scripted conversation as part of discharge instructions, backed up by fridge magnet with 5 key points.</p>	<p>Caregivers of infants born at hospital and brought for well-child care clinic. At time of discharge from hospital.</p>	<p>Structured interviews with convenience sample before (110) and different sample after intervention (112)</p>	<p>Predominantly African/American or Hispanic population.</p> <p>At interview a few weeks after receiving intervention, treatment group sig more likely to say they would take a break, and not continue to soothe infant if frustrated with crying.</p> <p>No difference in numbers stating knowledge about crying frequency and ability to calm a crying baby, or those who would call for help if frustrated. Treatment group more likely to recognise link between crying and shaking, and that taking a break would prevent shaken baby syndrome.</p> <p>No difference in levels of knowledge of SBS between the two groups, but treatment group more likely to report gaining knowledge from hospital.</p> <p>High level of staff compliance in implementing intervention.</p>
Cook et al (2012); Hiscock et al	<p>Baby Business/Cry Baby Programme to help parents manage baby's sleep and crying in first few months.</p>	<p>English speaking parents of healthy</p>	<p>RCT, 781 infants</p>	<p>Cook et al reports the study protocol, Hiscock et al results of the trial. No difference between groups on report of infant sleep, crying or feeding problems at either 4 or 6 months. However, those classed as frequent feeders less likely to have daytime sleep problems or crying problems at 4 months. This may</p>

(2014), Australia	<p>a) DVD and booklet giving info re normal patterns, strategies for management of baby and self-care.</p> <p>b) Telephone consultation with health professional to help apply materials;</p> <p>c) Group session to troubleshoot crying or sleep problems</p> <p>Also online video/ resources with more interactive presentation of range of topics.</p>	<p>infants referred by child health nurse.</p> <p>Materials mailed at 4 weeks, phone consultation at 6-8 weeks, group at 12 weeks.</p>		<p>be an at risk group, where parents use feeding to settle infants, so advice may have had a greater impact on this group. Effects faded at 6 months, possibly reflecting normal improvements. No change in parental report of infant crying as a problem – suggest more than education needed to change this attitude/belief.</p> <p>No difference in depression at 4 months but at 6 months intervention group less likely to score >9 on EPDS. Intervention group spending less time managing infants’ sleep at night, less likely to have changed formula. Improvements in mental health occurred despite no change in infants, possibly due to increased confidence, more realistic expectations.</p> <p>At 4 months, intervention group had sought help more often than control, but no difference at 6 months. More access may be due to booklet listing sources of support. Booklet and DVD both found useful, phone consultation and group also to varying degrees.</p>
Gilkerson (2014), USA	<p>Fussy baby network.</p> <p>Community based program to help parents’ immediate concerns and to build longer term parenting capacities.</p> <p>Immediate phone response, followed by visits within 24-48 hours. Generally short term support for 4-8 sessions. Infant mental health specialists provide service, supported by paediatricians. Referral to longer term services possible.</p>	<p>Any family struggling with infant’s crying, sleeping or feeding issues in first year</p>	Case studies	<p>Describes programme and what happens within the visit structure, including a couple of examples and how the intervention impacted on the parent. Not a trial of the intervention, but references other earlier publications by Gilkerson.</p> <p>Emphasise importance of empathic, non-blaming approach which seeks to understand their experience of the baby, offers supportive collaborative exploration into causes of crying and parents’ distress and builds parenting capacities to support infant.</p>
Karp (2012); Lim (2013); Anzman-Frasca (2013), USA	<p>Happiest Baby</p> <p>Book and DVD describing a 5 stage process of soothing baby: swaddling, side position, shh, swinging, sucking</p>	<p>Mothers of infants who are crying excessively</p>	<p>Lim: RCT, 13 mothers</p> <p>Anzman- Frasca: RCT, 110 mother/ infant dyads</p>	<p>Karp paper outlines the intervention but does not give references to actual research.</p> <p>Lim dissertation aimed to assess effectiveness, although exact nature of the intervention unclear as not been able to obtain the whole thesis. No statistically significant difference between intervention and control group at outcome, although intervention group showed a reduction in mean stress and improved bonding.</p> <p>Anzman-Frasca trialled this intervention as part of a study looking at alternative soothing strategies to feeding. Intervention increased chances of baby</p>

				transitioning from fussing/crying to awake and calm at 16 weeks, but not at 3 weeks.
Okamoto (2013), Japan	Single 3 hour session, with lectures on infant care and group discussion focusing on infant crying. Illustrated booklet with soothing strategies. Designed to increase understanding of infant crying, give advice on behavioural responses and provide information on support resources.	First time mothers, 1-2 months postpartum.	Controlled trial, control group those electing not to take part, 79 attended classes, 69 did not	Mothers were older than average, due to urban location of class. Confidence levels were significantly affected by the intervention compared to non-participants, but there was no change in levels of irritation, helplessness or feeling that the crying was endless. Intervention a limited success in helping rebuild confidence in parenting, but insufficient to reduce maternal psychological distress – authors suggest that programmes need to deal with this issue directly to make a difference, and to be longer duration. Central location of class reduced opportunities for parents to build links with other local parents as travelled from various parts of the city to attend.
Rowe (2012), Australia	Day stay programme to assist parents to find alternative ways of managing their concerns, receive coaching in interpreting cues, explore factors affecting loss of confidence and refer to supports within their community 7 hour day-long programme. Small groups, plus individualised support, coaching, advice, practice, discussion, presentations.	Mothers of infants under 12 months with unsettled behaviour	Pre-post design, 116 participants from 262 invited to programme	Some did not attend programme as they felt it was for more problematic cases. At baseline, parents rated their physical and mental health as significantly worse than community samples, and had high levels of psychological distress. Support received from partner and others rated by more than half as low. Distressing life events often identified. Many infants had medical conditions, higher levels of unsettled behaviour than community norms. Most happy with being a parent and with relationship with child, but not enjoying parenting. Participants' mental health and infant behaviours significantly improved at follow up (approx. 8 weeks after discharge), though behaviour still more unsettled than average. Parental confidence increased significantly. Improvement related to higher baseline depression, worse unsettled infant behaviour and higher educational levels, also with longer time between intervention and follow-up. Only half the parents had taken up referrals for range of reasons.
Sahin (2012), Turkey; Foley et al (2013), Australia	Shaken Baby prevention project Short animated film, posters, pamphlets and postcards. Film has been translated into various languages. "Shaking your baby is just not the deal" is key motto.	Mothers or parents of all newborn babies.	Sahin - reviews interventions in countries. Foley - describes dissemination of Australian programme to other countries.	Sahin gives an overview of prevention programmes used in various countries, highlights key elements: inclusion of information re SBS at discharge, advice on coping and soothing, range of materials including videos, cards, posters, leaflets. Highlights lack of knowledge in some healthcare professionals. Foley reports pilot: resources acceptable to parents, high number recalled key messages, sought assistance with crying infant. Introduction of translated materials in Brazil led to increases in knowledge, with some differences between those reading pamphlet and those watching video. Dissemination via public TV in hospital in Greece did

				not seem to be effective in terms of people contacting helpline - possibly not seen as an acceptable way of dealing with problem. Introduction of materials at different time points assessed in Turkey – knowledge of SBS increased in all groups but least for those exposed immediately post-partum, and better for those a few days later: pain or distraction of baby possible factors.
Salisbury et al (2012); Twomey et al (2012), USA	Infant Behaviour, Cry & Sleep Clinic. Psychosocial family treatment model. Three treatment sessions over 6 weeks; both parents encouraged to attend. Two clinicians – paediatrician and mental health clinician – addressing various aspects of the problem and offering recommendations. Development of individualised family treatment plan.	Parents referred by other clinicians. Babies aged 4-8 weeks, healthy and meet Rule of 3's for colic.	Salisbury – RCT; Twomey – Case studies	Salisbury reports significantly more rapid reduction in crying in treatment group, in the amount of crying, the number of babies meeting colic cutoff criteria, and in evening crying at 6 weeks. Also more sleep, less feeding time at 2, 6 and 10 weeks. Reduction in medical contacts. No statistically significant change in maternal depression. Medication use in babies in both groups had reduced. No other differences found. Twomey outlines the intervention and gives 3 clinical case studies detailing parents' varying degrees of distress and response to treatment. Emphasis on individualised approach, not one size fits all, and addressing needs of whole family, including seeing parent distress as part of colic picture.
Stewart et al (2011), Canada; Fujiwara et al (2012), Japan; Reese et al (2014), USA; Stephens et al (2014), Australia	Period of PURPLE Crying Developed by National Center on Shaken Baby Syndrome to increase knowledge and change behaviour related to crying and the dangers of shaking babies. DVD and booklet, providing information, strategies and guidelines. Website. Fridge magnet and bib also sometimes offered.	Mothers with healthy infant and uneventful pregnancy. Before or soon after birth: prenatal classes/ introduced by nurse at home visit or mailed 2 weeks after birth/at maternity	Stewart – pre-post impact evaluation of implementation of 2 year programme (>10,000 parents) Fujiwara – RCT, comparing PURPLE (105) to other materials on infant safety (96). Materials posted. Reese – post-test (211 mothers, 47 nurses).	Stewart implemented a triple dose strategy: in-hospital implementation with training of nurses, home visits and media campaign. Commitment statement also included. Statistically significant increase of 47% in increased knowledge of SBS in nurses post-training, high levels of satisfaction with training. PURPLE more acceptable to professionals than another similar programme as easier to integrate into practice - parents could be left to watch DVD. Video preferred. 93% of parents rated programme as useful. Fujiwara found crying knowledge significantly higher in treatment group at 2 months compared to control, also sharing of knowledge re walking away if frustrated, walking away during unsoothable crying. No increase in sharing knowledge about crying and dangers of shaking – possibly culturally unacceptable? No differences in infant's crying. Increases in knowledge only in mothers of second or later babies, not first time mothers – possibly easier to understand if based on previous experience? Difference between groups only in those who watched DVD. Particularly large change in walking away behaviour in Japan compared to other countries. Reese implemented materials in 5 birthing hospitals. At 2 month follow-up, 76% mothers rated programme as very useful, valued opportunity to discuss issues.

		wards and paediatric offices	Stephens – semi-structured interview and questionnaire with health professionals (33)	<p>Over half of mothers could recall one or more soothing techniques, had tried at least one; lower levels of recall or trying coping techniques. Only 41% had shared information with other caregivers, mostly because they did not perceive a risk of shaking due to it being family members or professionals. Nurses felt comfortable introducing the materials. Watching DVD did not impact on outcomes – in-person education found to be most significant element.</p> <p>Stephens explored opinions of PURPLE in health professionals working with very diverse ethnic/cultural mix in remote rural area of Australia. 87.8% felt materials would be appropriate and valuable in learning new strategies, and would be particularly useful for male caregivers in knowing what action to take when crying becomes frustrating. Some suggestion that materials needed adapting to indigenous population, or introducing by respected peer or health worker.</p>
UK 2014	<p>“Coping with Crying” NSPCC initiative to raise awareness of risks of shaken baby syndrome.</p> <p>DVD – based on USA ‘Portrait of Promise’ but remade for UK audience Plus website with information and additional videos embedded in it.</p>	All parents of newborn babies	Telephone survey comparing those who had seen the film with matched comparison group	<p>Video viewed by over 30.000 parents. Number participating in evaluation not given. 99% of parents who had seen the video at least six months earlier recalled having watched it and 82% had used the advice when caring for their baby. Intervention group more likely to agree that baby shouldn’t be handled roughly and reported lower levels of injuries among babies with feeding, crying or sleeping difficulties.</p>

