Preliminary Evaluation of a Primary Care Intervention for Cry-fuss Behaviours in the First Three to Four Months of Life ("The Possums Approach"): Effects on Cry-fuss Behaviours and Maternal Mood

Corresponding Author
Dr Pamela S Douglas MBBS FRACGP IBCLC PhD
The Possums Clinic for Mothers and Babies
Adjunct Senior Lecturer
Discipline of General Practice
The University of Queensland
Herston 4029
Brisbane, Queensland, Australia
pameladouglas@uq.edu.au
+61432982831

Dr Yvette Miller, BA (Psych) (Hons) PhD
Deputy Director, Queensland Centre for Mothers & Babies,
The University of Queensland,
St Lucia 4067
Brisbane, Queensland, Australia

Ms Anne Bucetti BSc, Grad Dip Diet, Grad Dip ED
Research Assistant
Queensland Centre for Mothers & Babies,
The University of Queensland,
St Lucia 4067
Brisbane, Queensland, Australia

Associate Professor Peter S Hill MBBS FAFPHM PhD
School of Population Health
The University of Queensland
Herston 4029
Brisbane, Queensland, Australia

Professor Debra K Creedy RN BA (Hons) PhD
Centre for Health Practice Innovation
Griffith University
Nathan 4111
Brisbane, Queensland, Australia

Abstract

Background

Problem crying in the first few months of life is common and complex problem, arising out of multiple interacting and co-evolving factors. Parents whose babies cry excessively receive conflicting advice as they seek help from multiple health providers and Emergency Departments, and may be admitted into tertiary residential services. Conflicting advice is a costly problem, arising out of discipline-specific interpretation of evidence.

Methods

An integrated, interdisciplinary primary care intervention ("The Possums Approach") to address cry-fuss problems in the first months of life was developed from available peer-reviewed evidence. This study reports on preliminary evaluation of delivery of the intervention. A total of 20 mothers who had crying babies under 16 weeks of age (average age 6.15 weeks) completed questionnaires, including the Crying Patterns Questionnaire and the Edinburgh Postnatal Depression Scale, before, and three to four weeks after, their first consultation with trained primary care practitioners.

Findings

Preliminary evaluation is promising. The Crying Patterns Questionnaire showed a significant decrease in crying durations, by one hour in the evenings ($p=0.001$) and half an hour at night ($p=0.009$), and the Edinburgh Postnatal Depression Scale showed a significant improvement in depressive symptoms, with the mean score decreasing from 11 to 6 ($p=0.005$). These findings are corroborated by an analysis of results for the subset of 16 participants whose babies were under 12 weeks of age (average age 4.71 weeks).

Conclusion

Preliminary results demonstrated significantly decreased infant crying in the evening and during the night and improved maternal mood, validating an innovative interdisciplinary clinical intervention for cry-fuss problems in the first few months of life. This intervention, delivered by trained health professionals, has the potential to mitigate the costly problem of conflicting advice post-birth.

Competing interests None

Summary statement

What is known about the topic?

Parents whose babies have cry-fuss problems in the first 3 or 4 months of life complain of receiving conflicting advice, and recourse to multiple providers. Early intervention, including for feeding problems, is important.

What does this paper add?

Preliminary evaluation of the effects of a primary care intervention for cry-fuss problems ("The Possums Approach") shows promise, demonstrating significantly decreased infant crying and significantly improved maternal depression and anxiety symptom scores at follow-up three to four weeks later.

Introduction

Background

One of the most common problems presenting to health professionals in the first months of life is the baby who cries and fusses. One in five new parents report that their baby cries excessively.[1] Many others cite unsettled behaviour as a reason for commencing supplementary feeds with formula, since crying and fussing are commonly believed to signal that the mother doesn't have enough breastmilk.[2-4] Research into infant crying has been confused by attempts to quantify and define problem crying, but we accept that clinically, problem crying is most usefully defined by parental perception.[5, 6] We use the terms crying, crying excessively, cry-fuss problems, and unsettled behaviour interchangeably.

Crying behaviour is a marker of risk post-birth, because it increases the risk of premature breastfeeding cessation, child abuse and postnatal depression.[7-9] Also, excessive crying has been linked with an increased risk of both feeding and behavioural problems later in childhood, particularly if the problem crying persists beyond three months.[10-12] Early intervention is important, yet doctors, midwives and child health nurses give conflicting advice. As a result, parents with crying babies are more likely to seek help from multiple health-care providers and Emergency Departments, which is costly.[13 14] They also resort to expensive residential programs.

Extensive review of heterogenous evidence from many fields of inquiry investigating infant crying in the first few months of life, including medical science, neuroscience, lactation science, developmental psychology and psychiatry, cross-cultural studies and evolutionary biology, demonstrate that infant cry-fuss behaviour is a complex problem, which emerges out of multiple dynamically interacting and co-evolving factors. It is more likely to occur in situations of prenatal stress, birth complications, or parental psychosocial risk factors, and appears to be moderated by temperament and an individual infant's level of neurodevelopmental maturity.[15, 16] Although infant crying and fussing often can't be traced back to any single cause, linear, discipline-specific interventions are commonly recommended, arising out of discipline-specific theoretical frames and interpretation of data. These linear approaches, including certain common medical diagnoses and behavioural interventions, have significant limitations, and risk unexpected outcomes.[17]

Aim

We developed an integrated, interdisciplinary intervention for cry-fuss problems in the first three to four months of life from key informant interviews and published comprehensive reviews[17-22] The clinical details of our approach ("The Possums Approach") are elucidated elsewhere.[23-25] During the consultation, the clinician systematically considers five domains: the fundamentals of baby and maternal health−'baby's health,' 'mother's health'−and the three neurobehavioural domains, of 'feeds', 'sensation,' and 'sleep' (Figure 1). Individualized plans are developed with parents that suit their values and philosophies; flexibility and experimentation are supported as a key to resilience; families are educated concerning the importance of sensible, cue-based care; and cross-professional communication and referral occur as necessary. Because both mother and infant are highly neuroplastic post-birth, the mother-baby pair are characterized by sensitivity to initial conditions, and intervention as early as possible is important.[26, 27] A neurobiological model for infant crying ("The Possums Model"), developed to explain the underlying mechanisms of infant crying and the underlying mechanisms of clinical intervention, has also been published elsewhere.[23, 28]

This study reports on a preliminary evaluation of the efficacy of this integrated, interdisciplinary clinical intervention ("The Possums Approach"), delivered by trained primary care practitioners to families who report that their baby has problem crying.

Methods

A single-group pre-post study was conducted to determine the effect of attendance at the Possums Clinic for Unsettled Babies by mothers of babies 16 weeks and under, who self-referred for help with infant cry-fuss problems. Both parents were encouraged to attend the consultation. The Possums Clinic for Unsettled Babies was located in a Queensland superclinic, UQ Health Care Annerley between October 2011 and October 2012. Possums health professionals comprised three trained GPs, two lactation consultants, an occupational therapist and a perinatal mental health practitioner, all trained by PD in "The Possums Approach". The training was delivered to Possums practitioners and fifteen other health professionals from the community as a one and a half hour presentation accompanied by a written handbook. The training was evaluated in two focus groups with independent facilitators, and the focus group data was transcribed, analysed and reported by a third independent researcher. The Research Ethics Committee at The University of Queensland approved the study, and patients signed written consent forms.

In the waiting room prior to the first consultation with a Possums health professional, mothers were asked to fill out a pre-consultation questionnaire. They were also invited to consent to a follow-up phone-call by an independent research assistant three weeks later, to arrange completion of a telephone post-consultation questionnaire at a convenient time. Each questionnaire took 10 or 15 minutes to complete. Both questionnaires included the Crying Pattern Questionnaire (a validated tool for measurement of frequency and duration of infant crying, frequency of bouts of unsoothable crying, feeding methods, and strategies used for settling.)[29-31] Likert scales were used to assess perception of sleep problems and maternal self-efficacy, and the Edinburgh Postnatal Depression Scale (EPDS), a widely used validated screening tool for postnatal anxiety and depression, was administered.[32] The initial consultation comprised a half hour consultation for both mother and baby, a total of one hour duration. The clinical intervention was flexibly delivered, appropriate to the family's needs. Mothers and babies were followed up, or referred to other health professionals, as required. Changes in crying patterns and the EPDS were tested using the Wilcoxon Signed Rank Test. Changes in feeding methods and sleep problems were tested using the McNemar's Test. Analyses were conducted with SPSS Statistics Version 20, IBM. Alpha was set to 0.05 for all analyses.

Results

Out of 40 eligible mothers presenting with cry-fuss problems in infants 16 weeks of age or less, 32 consented, and 20 completed both questionnaires (62.5%). The average age of infants was 6.15 weeks. 81 % of mothers reported feeding their baby any breastmilk in the previous 24 hours, and 68.8% had used formula at some time prior to the initial consultation. The average duration of follow-up time was 3.2 weeks with a minimum of 3 weeks and a maximum of 5 weeks. One mother who consented at pre-consultation withdrew prior to the second questionnaire. One consenting mother did not complete the second questionnaire as her baby was hospitalized for the 3 week follow-up period.

There was a statistically significant reduction in the babies' hours of fussing and crying in the evening ($p=0.001$), with the median hours reduced from 1.5 pre-consultation to 0.5 post-consultation. Hours of fussing and crying at night also significantly reduced ($p = 0.009$), from a median of from 0.5 hours preconsultation to 0 hours post-consultation. There was a statistically significant reduction in the EPDS, from a median score of 11 at pre-consultation to a median score of 6 post-consultation ($p=0.005$).

We found no significant change over time in feeding method (whether breast or mixed feeds or formula), or in mothers' perception of sleep as a problem, or in maternal self-efficacy. There was no statistically significant reduction in hours of fussing and crying in the morning (6am-midday) or afternoon (midday-6pm), or in bouts of unsoothable behaviour.

Because infant crying is a self-limiting problem, we also analysed the data for the smaller subset of mothers whose babies were 12 weeks of age or less, with average age of the infant 4.71 ($n=16$). This analysis corroborated the findings above: there was a statistically significant reduction in hours of fussing and crying in the evening (6pm to midnight) ($p=0.003$), and in the night (12 am to 6 am) ($p=0.016$). The median hours of fussing and crying reduced from 2 hours during the evening at pre-consultation to 0.875 hours post-consultation, and from 0.5 hours to 0.125 hours each night. There was a statistically significant reduction in the EPDS ($p=0.011$) from a median score of 10.5 at pre-consultation to 6.5 at post-consultation.

Our evaluation of maternal satisfaction with the Possums clinic showed that 95% rated feeding support as very or moderately helpful; 80% rated information on the baby's needs for sensation as very or moderately helpful; 75% rated information about sleep as very or moderately helpful; 85% rated information about how the baby's brain works as very or moderately helpful; and 85% rated the emotional support as very or moderately helpful.

Mothers reported on the positive benefits of the feeding management advice and access to specialized care: "I know what to do to calm my baby now" (ID 029) and "It was nice to go to someone specializing in babies who knows what they are talking about. They picked up the problem straight away" (ID 038). Several mothers commented on the emotional support and reassurance they received at the clinic: "The information made me less stressed, changed my attitude. I left the clinic feeling more psychologically equipped" (ID 011) and "She [Possums GP] was very good at making me feel like I was doing the right things" (ID 016). When asked to rate the POSSUMS program as a way to help with the baby's crying or unsettled behaviour, 60% of mothers rated it excellent or very good, 35% said it was good or fair and one mother (5%) said it was poor.

Discussion

Decreased crying during evenings and night

The finding that an interdisciplinary clinical intervention ("The Possums Approach") decreases crying in the evenings by one hour is important, because babies are more likely to cry during the evenings in the first months of life. The finding of decreased crying during the night by half an hour is also important, since it is not the number of instances of signaled nocturnal waking that are linked with postnatal depression, but the amount of time it takes a mother to go back to sleep. The longer the baby cries and fusses in the night, the more likely the negative impact on maternal anxiety levels and sleep efficiency.[33-35]

Although health professionals commonly advise parents to use behavioural interventions if their new baby is crying and fussing (e.g. feed spacing; teaching the baby to 'self-settle' by not allowing baby to fall asleep at the breast, in arms, or in the same room), behavioural interventions for this population arise out of a discipline-specific interpretation of evidence.[36, 37] Feed spacing and 'feed-play-sleep cycles' are associated with lactation failure;[38-40] infants who sleep in another room from parents are at increased risk of SIDS;[41] behavioural interventions do not decrease amounts of infant crying;[11, 42, 43] and more routinized, less flexible infantcare methods result in increased infant crying.[11, 44] Although behavioural interventions have been demonstrated to result in a mean extra 29 minutes in the cot over a 24 hour period and longer periods of self-regulated sleep periods nocturnally, these findings do not correlate with improved maternal or infant outcomes in the first 3-4 months of life.[45-47] Cue-based care, on the other hand, has been linked with more settled infant behavior, and our findings corroborate this link.[11, 44]

Decreased symptoms of depressed or anxious mood

One in six women suffer postnatal depression, and mothers with babies who cry excessively are more at risk, with higher symptom scores on the EPDS.[8] The findings of significantly decreased EPDS scores in our study, from on average 11 to 6, support our hypothesis that an interdisciplinary clinical intervention for cry-fuss behavior ("The Possums Approach"), which identifies and manages underlying clinical problems including feeding problems, helps optimize maternal mental health.

Optimising breastfeeding support is known to protect against postnatal depression.[35] Contemporary highly medicalised birthing practices compromise the initiation and duration of breastfeeding, by affecting both primitive neonatal reflexes and maternal neurohormone secretion.[48-51] Doctors, nurses and researchers–even those with positive attitudes to breastfeeding–have significant knowledge gaps the identification and management of breastfeeding problems.[52-55] In this context, almost all crying baby research is confounded by unidentified and unmanaged feeding problems. For example, overly frequent or prolonged breastfeeding with frequent night-waking and crying indicates an underlying feeding problem, which requires appropriate assessment and management, not behavioural regulation with feed spacing.[38-40] In another example, back-arching and feeding refusal indicate an underlying feeding problem, not acid-peptic or allergic oesophagitis.[56] Disrupted maternal-infant relations concerning feeds quickly entrench, regardless of feeding method, and may persist long-term.[57-59]

Improved maternal mental health has important implications for the child's long-term mental health, due to the deleterious effects of maternal depression on infant brain development long-term.[26]

Study limitations

Our study has significant limitations. Because of the small sample size, and lack of a non-intervention comparison group, it is indicative only. Crying baby research is also confounded by the natural attrition of infant crying, because crying begins to decrease from about six weeks, and is usually resolved by 12-16 weeks of age.[60] For example, natural attrition confounded the results of a paediatrician-delivered tertiary intervention for 59 unsettled infants, whose parents had previously sort help from multiple providers in primary care. That intervention demonstrated significant decreases in EPDS and in parental report of the presenting problem (either crying or sleep problems), but the infants had an average age of

14.9 weeks of ???, ranging from two weeks to seven months. Similarly, there was no comparison group.[61]

In our study, we examined the subset of babies 12 weeks of age or less (average age 4.71 weeks) to help mitigate against this problem of natural attrition, yielding the same results as our analyses of the larger sample of babies 16 weeks or less in age (average age 6.15 weeks). Our response rate of 60.6% may bias the results toward those who had a positive outcome, but compares well with response rates in another study that offered an intervention to mothers in the community whose babies have cry-fuss problems.[62] Elsewhere, we've argued that improved maternal depression and anxiety symptom scores resulting from interventions which include a behavioural component in this age group are attributable to the effects of group support, caring therapeutic relationships and caring residential support, rather than to any specific behavioural component.[45-47] The improved maternal depression and anxiety symptoms score demonstrated in our evaluation could also be attributed to the caring therapeutic relationships which characterized our clinical intervention.

Conclusion

Parents with unsettled babies receive conflicting advice, and recourse to multiple health providers, including Emergency Departments.[13] The problem of conflicting advice arises out of discipline-specific theoretical frames and interpretations. Elsewhere, we identified the need for an early interdisciplinary primary care intervention for families whose babies have cry-fuss problems in the first few months of life.[21] We developed an interdisciplinary intervention for cry-fuss problems in the first months of life out of systematic reviews of the heterogenous evidence ("The Possums Approach"), delivered by trained primary care practitioners. Preliminary evaluation demonstrates decreased duration of evening and night-time crying and improved maternal mood, three to four weeks after intervention. Although this pilot study has significant limitations, including small sample size, it nevertheless establishes the program's readiness for summative evaluation, according to Patton's model for the evaluation of complex interventions.[63]

Acknowledgements

PD thanks the health professionals of The Possums Clinic for Mothers and Babies for their professionalism and passion.

Author contributions

Conceived and designed the study: PD, YM, PH, DC. Data collection: PD, AB. Analysed the data: AB, YM. Wrote the paper: PD, PH, YM, DC.

Figure legend

Figure 1.

The five domains of "The Possums Approach."

References

1. Wake M, Morton-Allen E, Poulakis Z, Hiscock H, Gallagher S. Prevalence, stability, and outcomes of cry-fuss and sleep problems in the first 2 years of life: prospective community-based study. *Pediatrics*. 2007;117:836-842.
2. Li R, B S, Chen J, Grummer-Strawn LM. Why mothers stop breastfeeding: mothers' self-reported reasons for stopping during the first year. *Pediatrics*. 2008;122:S69-S76.
3. de Lauzon-Guillain B, Wijndaele K, Clark M, Acerini CL, Hughes IA, Dunger DB, et al. Breastfeeding and infant temperament at age three months. *PLoS ONE*. 2012;7:e29326.
4. Odom E, Scanlon K, Perrine C, Grummer-Strawn L. Reasons for earlier than desired cessation of breastfeeding. *Pediatics*. 2013;131:e726-732.
5. Barr RG. Normality: a clinically useless concept. The case of infant crying and colic. *J Dev Behav Pediatr*. 1993;14:264-270.
6. Reijneveld SA, Brugman E, Hirasing RA. Excessive infant crying: the impact of varying definitions. *Pediatrics*. 2001;108:893-897.
7. Howard C, Lanphear N, Lanphear B, Eberly S, Lawrence R. Parental responses to infant crying and colic: the effect on breastfeeding duration. *Breastfeed Med*. 2006;1(3):146-155.
8. Vik T, Grote V, Escribano J, Socha J, Verduci E, Fritsch M, et al. Infantile colic, prolonged crying and maternal postnatal depression. *Acta Paediatr*. 2009;8:1344-1348.
9. Reijneveld SA, van der Wal M, Brugman E, Hira Sing R, Verloove-Vanhorick S. Infant crying and abuse. *Lancet*. 2004;364:1340-1342.
10. Hemmi MH, Wolke D, Schneider S. Associations between problems with crying, sleeping and/or feeding in infancy and long-term behavioural outcomes in childhood: a meta analysis. *Arch Dis Child*. 2011;96(7):622-629.
11. Sirvinskiene G, Zemaitene N, Zaborskis A, Markuniene E, Jusiene R. Infant difficult behaviors in the context of perinatal biomedical conditions and early child environment. *BMC Pediatr*. 2012;12:44.
12. Brown M, Heine RG, Jordan B. Health and well-being in school-age children following persistent crying in infancy. *J Paediatr Child Health*. 2009;45:254-262.
13. McCallum SM, Rowe HJ, Gurrin LC, Quinlivan JA, Rosenthal DA, Fisher JRW. Unsettled infant behaviour and health service use: a cross-sectional community survey in Melbourne, Australia. *J Paediatr Child Health*. 2011;47:818-823.
14. Morris S, St James-Roberts I, Sleep J, Gilham P. Economic evaluation of strategies for managing crying and sleeping problems. *Arch Dis Child*. 2001;84:15-19.
15. Kurth E, Spichiger E, Cignacco E, Kennedy HP, Glanzmann R, Schmid M, et al. Predictors of Crying Problems in the Early Postpartum Period. *J Obstet Gynecol Neonatal Nurs*. 2010;39:250-262.
16. Schmid G, Schreier A, Meyer R, Wolke D. Predictors of crying, feeding and sleeping problems: a prospective study. *Child Care Health Dev*. 2011;37:493-502.

17. Douglas PS, Hill PS, Brodribb W. The unsettled baby: how complexity science helps. *Arch Dis Child*. 2011;96:793-797.
18. Douglas P. Diagnosing gastro-oesophageal reflux disease or lactose intolerance in babies who cry alot in the first few months overlooks feeding problems. *J Paediatr Child Health*. 2013:doi:10.1111/jpc.12153.
19. Douglas P, Hill PS. Behavioural sleep interventions in the first six months of life do not improve outcomes for mothers or infants: a systematic review. *J Dev Behav Pediatr*. 2013:in press.
20. Douglas P, Hiscock H. The unsettled baby: crying out for an integrated, multidisciplinary, primary care intervention. *Med J Aust*. 2010;193:533-536.
21. Douglas P, Mares R, Hill P. Interdisciplinary perspectives on the management of the unsettled baby: key strategies for improved outcomes. *Australian Journal of Primary Health*. 2011;18:332-338.
22. Douglas PS. Excessive crying and gastro-oesophageal reflux disease in infants: misalignment of biology and culture. *Med Hypotheses*. 2005;64:887-898.
23. Douglas P, Shirley B. How to Treat: The Crying Baby. *Australian Doctor*. 2013:In Press.
24. Douglas P, Hill P. Managing infants who cry excessively in the first few months of life. *BMJ*. 2011;343:d7772.
25. Douglas PS, Hill PS. The crying baby: what approach? *Curr Opin Pediatr*. 2011;23:523-529.
26. Swain JE, Lorberbaum JP, Kose S, Strathearn L. Brain basis of early parent-infant interactions: psychology, physiology, and *in vivo* functional neuroimaging studies. *Journal of Child Psychology and Psychiatry*. 2007;48:262-287.
27. Shonkoff JP, Boyce WT, McEwen BS. Neuroscience, molecular biology, and the childhood roots of health disparities. *JAMA*. 2009;301(21):2252-2259.
28. Douglas PS, Hill PS. A neurobiological model for cry-fuss problems in the first three to four months of life. 2013:Under review.
29. Alvarez M, St James-Roberts I. Infant fussing and crying patterns in the first year in an urban community in Denmark. *Acta Paediatr*. 1996;85(463-466).
30. Wolke D, Gray P, Meyer R. Validity of the Crying Patterns Questionnaire in a sample of excessively crying babies. *Journal of Reproductive and Infant Psychology*. 1994;12:105-114.
31. St James-Roberts I, Hurry J, Bowyer J. Objective confirmation of crying durations in infants referred for excessive crying. *Arch Dis Child*. 1993;68:82-84.
32. Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression. Development of the 10-item Edinburgh Postnatal Depression Scale. *Br J Psychiatry*. 1987;150(782-786).
33. Goyal D, Gay CL, Lee K. Fragmented maternal sleep is more strongly correlated with depressive symptoms than infant temperament at three months postpartum. *Arch Womens Ment Health*. 2009;12:229-237.
34. Dorheim SK, Bondevik GT, Eberhard-Gran M, Bjorvatn B. Sleep and Depression in Postpartum Women: A Population-Based Study. *Sleep*. 2009;32:847-855.
35. Miller LJ, LaRusso EM. Preventing Postpartum Depression. *Psychiatr Clin North Am*. 2011;34:53-65.
36. Matricciani LA, Olds TS, Blunden SL, Rigney G, Williams MT. Never enough sleep: a brief history of sleep recommendations for children. *Pediatrics*. 2012;129:548.
37. Stremler R, Hodnett E, Kenton L, Lee K, Weiss S, Weston J, et al. Effect of behavioural-educational intervention on sleep for primiparous women and their infants in early postpartum: multisite randomised controlled trial. *BMJ*. 2013;346:doi: 10.1136/bmj.f1164.
38. Hill PD, Aldag JC, Chatterton RT, Zinaman M. Primary and secondary mediators' influence on milk output in lactating mothers of preterm and term infants. *J Hum Lact*. 2005;21(2):138-150.
39. Kent JC, Mitoulas LR, Cregan MD, Ramsay DT, Doherty DA, Hartmann PE. Volume and frequency of breastfeedings and fat content of breast milk throughout the day. *Pediatrics*. 2006;117(3):e387-e395.

40. McCormick FM, Tosh K, McGuire W. Ad libitum or demand/semi-demand feeding versus scheduled interval feeding for preterm infants. *Cochrane Database Syst Rev*. 2010;Art. No.: CD005255(2).
41. Blair PS, Heron J, Fleming PJ. Relationship between bed-sharing and breastfeeding: longitudinal, population-based analysis. *Pediatrics*. 2010;126:e1119-e1126.
42. St James-Roberts I, Sleep J, Morris S, Owen C, Gillham P. Use of a behavioural programme in the first 3 months to prevent infant crying and sleep problems. *J Paediatr Child Health*. 2001;37.
43. Symon B, Marley JE, Martin JA, Norman ER. Effect of a consultation teaching behaviour modification on sleep performance in infants: a randomised controlled trial. *Med J Aust*. 2005;182(5):215-218.
44. St James-Roberts I, Alvarez M, Csipke E, Abramsky T, Goodwin J, Sorgenfrei E. Infant crying and sleeping in London, Copenhagen and when parents adopt a "proximal" form of care. *Pediatrics*. 2006;117:e1146-e1155.
45. Bryanton J, Beck C. Postnatal parental education for optimizing infant general health and parent-infant relationships. *Cochrane Database Syst Rev*. 2010:Issue1. Art.No.:CD004068. DOI:004010.001002/14651858.CD14004068.pub14651853.
46. Price AM, Wake M, Ukoumunne OC, Hiscock H. Outcomes at six years of age for children with infant sleep problems: longitudinal community-based study. *Sleep Medicine*. 2012.
47. Kendall-Tackett K, Cong Z, Hale TW. The effect of feeding method on sleep duration, maternal well-being, and postpartum depression. *Clinical Lactation*. 2011;2.2:22-26.
48. Dewey KG, Nommsen-Rivers LA, Heinig MJ, Cohen RJ. Risk factors for suboptimal infant breastfeeding behavior, delayed onset of lactation, and excess neonatal weight loss. *Pediatrics*. 2003;112:607.
49. Brown A, Jordan S. Impact of birth complications on breastfeeding duration: an internet survey. *J Adv Nurs*. 2012.
50. Colson SD, Meek JH, Hawdon JM. Optimal positions for the release of primitive neonatal reflexes stimulating breastfeeding. *Early Hum Dev*. 2008;84:441-449.
51. Sakalidis VS, Williams TM, Hepworth AR, Garbin CP, Hartmann PE, Paech MJ, et al. A comparison of early sucking dynamics during breastfeeding after cesarean section and vaginal birth. *Breastfeed Med*. 2012.
52. Feldman-Winter L, Barone L, Milcarek B, Hunter K, Meek J, Morton J, et al. Residency curriculum improves breastfeeding care. *Pediatrics*. 2010;126:289-297.
53. Bernaix LW, Beaman ML, Schmidt CA, Harris JK, Miller LM. Success of an Educational Intervention on Maternal/Newborn Nurses' Breastfeeding Knowledge and Attitudes. *J Obstet Gynecol Neonatal Nurs*. 2010;39:658-666.
54. Brodribb W, Fallon A, Jackson C, Hegney D. Breastfeeding and Australian GP registrars - their knowledge and attitudes. *J Hum Lact*. 2008;24(4):422-430.
55. Renfrew M, Pokhrel S, Quigley M, McCormick F, Fox-Rushby J, Dodds R, et al. Preventing disease and saving resources: the potential contribution of increasing breastfeeding rates in the UK. London: Unicef UK; 2012.
56. Smillie CM. How infants learn to feed: a neurobehavioral model. In: Watson CG, editor. Supporting sucking skills. New York: Jones and Bartlett Learning; 2012. p. 83-104.
57. Ammaniti M, Lucarelli L, Cimino S, D'Olimpio F, Chatoor I. Maternal psychopathology and child risk factors in infantile anorexia. *Int J Eat Disord*. 2010;43(3):233-240.
58. Reyna BA, Pickler RH. Mother-infant synchrony. *J Obstet Gynecol Neonatal Nurs*. 2009;38:470-477.
59. Davies HW, Satter E, Berlin KS, Sato AF, Silverman AH, Fischer EA, et al. Reconceptualizing feeding and feeding disorders in interpersonal context: the case for a relational disorder. *J Fam Psychol*. 2006;20(3):409-417.
60. Wolke D, Samara M, Alvarez Wolke M. Meta-analysis of fuss/cry durations and colic prevalence across countries. 2011:Proceedings of the 11th International Infant Cry Research Workshop; June 2011; Zeist, The Netherlands.

61. Smart J, Hiscock H. Early infant crying and sleeping problems: A pilot study of impact on parental well-being and parent-endorsed strategies for management. *J Paediatr Child Health*. 2007;43(284-290).
62. Miller-Loncar C, Bigsby R, High P, Wallach M, Lester B. Infant colic and feeding difficulties. *Arch Dis Child*. 2004;89:908-912.
63. Patton MQ. Developmental evaluation: applying complexity concepts to enhance innovation and use. New York: The Guildford Press; 2011.