IN THIS ISSUE . . .

Wrapping and swaddling infants: child health nurses’ knowledge, attitudes and practice
Jeanine Young, Rosemary Gore, Barbara Gorman and Karen Watson

Relationship between maternal total protein and maternal measles antibodies of mother–infant pairs at the University of Maiduguri Teaching Hospital, Borno, Nigeria
Baba Usman Ahmadu, Ashir Garba Mohammed, Mustapha Modu Gofama, Malgwi Esther and Sajor Njidda

The perspectives of young people on their use of alcohol and risks at school leavers festivals
Alison Hutton and Lynette Cusack

Scoping review of the literature about family-centred care with caregivers of children with cystic fibrosis
Linda Shields, Ailsa Munns, Marjory Taylor, Lynn Priddis, Judy Park and Tonia Douglas

Cochrane Nursing Care Network
Carmel Collins and Trudi Mannix
Neonatal, Paediatric and Child Health Nursing

Volume 16 Number 3 – November 2013

Official journal of the
Australian College of Children & Young People’s Nurses
www.accypn.org.au

Australian College of Neonatal Nurses
www.acnn.org.au

Neonatal Nurses College Aotearoa

Nurses for Children and Young People of Aotearoa

Journal philosophy

The journal is the official publication of Australian and New Zealand professional nursing groups caring for babies, children and their families. The four organisations represent a diversity in nursing, ranging from intensive care nursing to the community-based nursing services, found in cities and remote areas throughout Australia and New Zealand.

The journal will endeavour to reflect this diversity by its content. Neonatal, paediatric and child health nursing have many different aspects that may be relevant to more than one sector of the membership. In addition to clinically oriented material, including research, the journal also provides a forum for articles on professional aspects of nursing that apply to all nurses and in particular to nurses working with babies, children and families.

This journal has a Band 2 JET Ranking from the Australian Council of Deans

Disclaimer: Mention of products in articles or in advertisements in the NPCHN journal does not constitute endorsement by ACCYPN, ACNN, NNCA or NCYPA.
Who really promotes health?

Sarah J M Shaefer RN, PhD, Assistant Professor
Johns Hopkins University School of Nursing

According to the World Health Organization, “Health promotion is the process of enabling people to increase control over, and to improve, their health.” Successful health promotion efforts will address the individual across the lifespan within their community and its environment. For childhood health promotion, a key factor is building capacities of parents and communities. The child’s inclusion in these efforts is important for success. Articles in this edition describe health promotion efforts at a community level and nursing intervention at an institution level. Additionally, how do we incorporate the voice of children in the health promotion process? The simple answer is to discuss health and health goals with children. Motivational interviewing will be proposed as one approach to engage the child and plan in health promotion activities.

In this journal, Hutton and Cusack report that attendees (Schoolies) at the school leavers’ festival were not focused on harm minimisation regarding alcohol consumption. Schoolies expected the community to protect them. Because these researchers asked the Schoolies about their priorities, the health providers and community used data to plan safeguards for students at this event. This article illustrates the importance of obtaining data from users to inform event plans. The event exemplifies the inclusion of Schoolies, health providers, volunteer organisations, government officials to plan an event that provides safeguards for the health of the schoolies and the community. The community planned for a safe environment for Schoolies and the community that was informed by the Schoolies.

Young, Gore, Gorman and Watson report on knowledge attitude and practice of child health nurses regarding infant wrapping. This is an important health message to decreases the risk of infant dying of SIDS or SUDI. There was wide variation in knowledge in part due to the lack of evidence-based guidelines. The policy implementation is needed to promote the health of infants. Changing nurse behaviour can be complex. Shaefer et al. report on a four-year demonstration project to reduce infant deaths related to sleep environment, based on American Academy of Pediatrics (AAP) safe sleep guidelines. Education changed knowledge but change in practice to make it evidence-based required authority and infrastructure. Hospital administration that supported creation and implementation of a policy with expectations that nursing staff place infants on their back for sleep and disseminate the same message to parents to comply with AAP guidelines. Sustained change in clinical practice needs commitment of both administration and staff implementing the policy.

These articles illustrate the various levels involved in any health promotion activity. Knowledge of the individual’s (child, nurse or parent) goal is basic to any approach. On an individual level, motivational interviewing is an evidence-based approach to assess an individual’s goals to improve their health. Schwartz lists the steps in the motivational interviewing process with obese children. This patient/child-centred approach includes establishing a relationship with the child, expressing concern about unhealthy behaviour, identifying mutual goals, listing the pros and cons of change, assessing child’s importance and confidence changing behaviour and identifying the steps to change.

Kostenius has taken this child-centred approach one step further by developing an environment where students, aged 10–11 years, lead the health promotion activities with the support of their teacher. Students designed programs in massage, outside play and music. Students are competent to create and lead these activities with the support of their teacher. An additional benefit was that the project also increased health literacy by applying health information to life experiences.

Nurses are in a position to partner with children for health promotion in the community. This approach should be structured in the health promotion curricula in nursing school. One approach is to provide a framework for students when providing health education. The following are considerations before attempting any educational program:

- What do they know?
- What do they want to know?
- What are the nurse's education goals?
- What are the patient's education goals?
- It is the patient's choice to participate in health promotion activities.

Health promotion is a complex activity that extends beyond the individual practitioner. We need to prepare nurses in effective approaches to promote health education in their communities. This includes knowledge of community assessment that considers the client population, environment and current systems of support. More research is needed to determine the effectiveness of approaches to include the voice of children in this process.

References

Wrapping and swaddling infants: child health nurses’ knowledge, attitudes and practice

Jeanine Young *
Professor of Nursing, School of Nursing and Midwifery, University of the Sunshine Coast; Adjunct Professor, Centre for Health Practice Innovation, Griffith University; Honorary Adjunct Professor, Centre for Online Health, University of Queensland, QLD, Australia
Email Jyoung4@usc.edu.au

Rosemary Gore
Clinical Nurse, Ellen Barron Family Centre, Children’s Health Queensland Hospital and Health Service, Brisbane, QLD, Australia

Barbara Gorman
Clinical Nurse, Child Youth and Family Health Services, QLD, Australia

Karen Watson
Research Assistant, School of Nursing & Midwifery, University of the Sunshine Coast, QLD, Australia

*Corresponding author

Abstract
Infant wrapping and/or swaddling is an evidence-based care practice that when applied appropriately can be a strategy for settling an infant and promoting supine sleep positioning as recommended for the reduction of sudden unexpected deaths in infancy (SUDI). This study aimed to describe the knowledge, attitudes and practices of child health nurses (CHN) relating to the advantages and disadvantages of wrapping; principles of safe infant wrapping; and parent education about infant wrapping as a settling strategy.

Design
Using a descriptive, cross-sectional survey design the knowledge, attitudes and self-reported practices of CHNs working within nine health service districts throughout south-east Queensland, Australia, were explored.

Results
Conducted at a time when no statewide guidelines for infant wrapping existed and achieving an excellent response rate from participants (161, 89%), this study demonstrated a wide variation in knowledge, attitudes and practices in relation to wrapping as a strategy to promote infant sleep and to encourage babies to sleep on their backs, consistent with public health recommendations.

Conclusions
Study results identified a need for the development of evidence-based practice guidelines for CHNs to promote consistency in practice, parent advice and education that would help to further reduce the risk of SUDI. There is a need for further investigation into the impact that a targeted educational intervention based on evidence-based guidelines for safe infant wrapping would have on CHN knowledge and practice.

Implications for clinical practice
• CHNs are an important information source for parents.
• Prone position is a risk factor for SUDI.
• Wrapping strategies based on principles of safe infant wrapping can assist parents to settle their babies in the recommended supine infant sleep position.
• Evidence-based information and guidelines will promote consistent practice by CHNs.
• Consistent, evidence-based information use by parents in caring for their baby will reduce the risk of SUDI.

Keywords: Wrapping, swaddling, sleep positioning, safe sleep, SUDI, SIDS.
What is known about this topic

- Infant wrapping or swaddling is a common infant care practice used by many cultures since medieval and ancient times.
- Wrapping has many benefits, but it is associated with some adverse outcomes depending on techniques used.
- Infant wrapping based on safe wrapping principles can assist parents to settle babies in the recommended supine sleeping position to reduce the risk of SUDI.

What this paper adds

- This study identified a wide variation in CHNs’ knowledge, attitudes and practices relating to wrapping as a strategy to promote infant settling and safe infant sleeping to reduce the risk of SUDI.
- Consistent evidence-based guidelines are needed at a local, state and national level to support CHNs in educating parents about how to use this common infant care strategy safely and effectively.

Declarations

Manuscript category: Empirical research — quantitative.

Conflict of interest statement: No conflict of interest has been declared by the authors.

Funding source: The Royal Children’s Hospital Foundation (RCHF Grant No: 914-046).

Introduction

Managing unsettled infant behaviour and promoting infant sleep are issues that health professionals who work with parents of young infants around the world routinely address. Health professionals who provide guidance to parents relating to these issues also need to support public health recommendations that promote evidence-based safe infant sleep practices. Prone sleep positioning for infants is a known risk factor for sudden infant death. The use of infant wrapping, also commonly termed swaddling, has been identified as a strategy that can be used to calm infants, improve settling and promote supine sleep.

Background

In Australia, the state of Queensland has reported a rate of prone sleeping of approximately 12% for infants aged three months, a figure substantially higher than rates reported by other states and territories. Queensland has also experienced a higher than national rate of infant mortality attributed to sudden unexpected deaths in infancy (SUDI) including sudden infant death syndrome (SIDS) and fatal sleeping accidents since the first Australian Reducing the Risk of SIDS campaign in 1991 (Table 1). Given the key role health professionals play in health promotion, the extent to which child health nurses (CHNs) were aware of, and utilise, infant wrapping and/or swaddling as a sleep strategy in their parenting support and education was explored.

Table 1: Definition of terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sudden and unexpected death in infancy (SUDI)</td>
<td>SUDI is the sudden, unexpected death of an infant usually occurring during sleep, in which the cause is not immediately obvious. SUDI includes sudden infant death syndrome (SIDS) and fatal sleeping accidents.</td>
</tr>
<tr>
<td>Sudden infant death syndrome (SIDS)</td>
<td>Sudden infant death syndrome (SIDS) is defined as the sudden and unexpected death of an infant under one year of age, with onset of the lethal episode apparently occurring during sleep, that remains unexplained after a thorough investigation including performance of a complete autopsy and review of the circumstances of death and the clinical history.</td>
</tr>
<tr>
<td>Fatal sleeping accident</td>
<td>A death occurring during infant sleep, resulting from an accident, fall, suffocation, or mechanical asphyxiation. Fatal sleeping accidents are explained deaths that meet SUDI Criteria.</td>
</tr>
</tbody>
</table>
and colleagues reported that an infant who was swaddled and positioned prone had a twelvefold increased risk of SIDS compared with non-swaddled prone infants for whom the risk of SIDS was increased by three times. Adverse outcomes associated with wrapping include increased respiratory infections with tight swaddling; increased developmental dysplasia of the hip when lower limb flexion is overly restricted; hyperthermia when baby is overdressed and wrapped, or inappropriate wrapping material is used, especially if the infant’s head is also covered; and delayed postnatal weight gain if the infant is separated from the mother immediately after birth. Thus, it is critical that the correct technique for swaddling is used. Wrapping and/or swaddling does not negatively influence the incidence of rickets or breastfeeding outcomes.

More recently the need for differentiation between the types of wrapping and/or swaddling practices used within a study has been highlighted. British research reported an increased risk of sudden infant death with swaddled infants; however, did not account for known risk factors (for example, sleep position, bed-sharing while swaddled) or consistency with safe infant wrapping principles in the analyses. The current statement on swaddling compiled by the International Society for the Prevention of Infant Death (ISPID) includes the evidence thus far surrounding ‘changes’ in sleep habits. One physiological study with a small sample has identified that arousability is reduced by swaddling when the practice is newly introduced in older infants in a way that is not seen when infants are swaddled from birth. Further research needs to be conducted to replicate these findings; however, it does have clinical implications for practitioners in relation to the timing of changes to sleep practices.

Overall, there are several important advantages of wrapping and/or swaddling in the supine position, the most important being a reduction in sudden infant death. The disadvantages of infant wrapping and/or swaddling have been identified as being predominantly related to the use of incorrect swaddling practices, highlighting the importance of evidence-based safe sleep and settling information being provided to parents and carers. Wrapping and/or swaddling is a widely used practice that is promoted by CHNs; however, up until the time that this study was conducted, there were no specific guidelines for clinical practice. At the time of this study, resources available to CHNs included the Karitane pamphlet on wrapping and, immediately prior to this study, a position statement released by SIDS and Kids that supported infant wrapping as a strategy to support safe sleep positioning (Table 2).

Karitane nurses are nurses trained in the care of young babies and their mothers according to the principles of the Plunket Society, New Zealand. There was no specific state (Queensland Health) or local policy to guide clinical practice. Interestingly, the Karitane pamphlet also highlighted that there was (at the time), little scientific information which explained why people wrap babies and nor was there any one correct way.

Table 2: Summary of safe infant wrapping principles available to clinicians at time of study*

<table>
<thead>
<tr>
<th>Principle</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIDS and KIDS Australia endorses the practice of wrapping infants to promote sleeping in the supine position.</td>
<td></td>
</tr>
<tr>
<td>If parents choose to wrap their baby for sleep*:</td>
<td></td>
</tr>
<tr>
<td>• wrap material should be muslin or light cotton</td>
<td></td>
</tr>
<tr>
<td>• wrap does not cover baby’s head to prevent overheating</td>
<td></td>
</tr>
<tr>
<td>• avoid overheating — do not overdress baby under the wrap</td>
<td></td>
</tr>
<tr>
<td>• ensure SIDS and KIDS Safe Sleeping guidelines are followed.</td>
<td></td>
</tr>
<tr>
<td>Put baby on the back to sleep, from birth.</td>
<td></td>
</tr>
<tr>
<td>Sleep baby with face uncovered.</td>
<td></td>
</tr>
<tr>
<td>Cigarette smoke is bad for babies.</td>
<td></td>
</tr>
<tr>
<td>Start loosening the wrap with view to not using it at all when baby starts rolling over.</td>
<td></td>
</tr>
<tr>
<td>If parent or baby not comfortable with wrapping, do not use this method for settling.</td>
<td></td>
</tr>
</tbody>
</table>

*Safe infant wrapping principles at time of study based on recommendations stated in Wrapping Your Baby 0–4 months. This pamphlet was available in some states of Australia, and used in some of the health districts participating in this study.

Statement of the problem

The CHN is an important source of information regarding safe sleeping and settling strategies for parents. The need for this study originated in the development of a clinical pathway for settling infants under three months of age that had been introduced into early parenting and child health centres within the study region. Anecdotally, nurses displayed varying levels of knowledge and differing attitudes to wrapping and/or swaddling babies. The aims of this study were, therefore, to describe the knowledge, attitudes and practices of CHNs relating to:

1. advantages and disadvantages of wrapping
2. knowledge of the principles of safe wrapping
3. techniques used in wrapping
4. parent education about wrapping as an infant settling strategy and SUDI risk reduction strategy.

The study

Methodology

Design

This study used a descriptive, cross-sectional survey design to describe the knowledge, attitudes and self-reported practices of CHNs in south-east Queensland in relation to wrapping and/or swaddling.

Questionnaire development and pilot

No existing survey tools were identified that specifically
addressed the topic under investigation. Questions were developed following an examination of the literature, and themes identified through focus group sessions conducted with a sample of CHNs working in two child health centres. The questionnaire was based on a previously successful format which examined safe infant sleeping priorities. To establish content validity, the instrument was first examined by an expert panel comprising nurse researchers, educators, managers and clinicians. The instrument was tested according to the Lynn method for clarity, apparent internal consistency and content validity. Language, wording, appropriateness, relevance and comprehensiveness of the questionnaire items were examined. Whilst there were some individual comments about completion of the demographic questions and interpretation of the knowledge items; consensus by the panel was achieved for 83% of the items included; therefore no changes were made to the questionnaire. In addition to demographic questions, the questionnaire comprised multiple choice and short answer questions relating to knowledge and attitudes and practice. Content included advantages and disadvantages of wrapping/swaddling, infant settling strategies, wrapping materials and styles, principles of safe infant sleeping, sources of knowledge, and parent advice. The survey was piloted amongst a sample of CHNs from three facilities within the study region. Pilot results supported both the appropriateness of the tool and highlighted the need for further investigation of this subject.

**Sample/participants**

A purposive sample was drawn from the target population of registered nurses working in child health nursing roles within one of nine health service districts throughout southeast Queensland, Australia. Participants were identified by their area managers in collaboration with the research team. Eligible participants were identified within the selected study areas in a permanent or temporary, full-time, part time or casual capacity, and were rostered to work at the time of recruitment. The survey was piloted amongst a sample of CHNs from three facilities within the study region. Pilot results supported both the appropriateness of the tool and highlighted the need for further investigation of this subject.

**Data collection**

Each participant was provided with a participant information sheet and questionnaire distributed via institutional mail or by postal services. Completed questionnaires were returned either via reply-paid envelopes or to sealed collection points. Participants were recruited from the nine participating districts during an eight-week period, July–August 2005. The survey took approximately 10 minutes to complete.

**Ethical considerations**

Ethical approval from each of the nine participating Health Services Districts and organisational Human Research Ethics Committees was obtained prior to study commencement. Participant consent was implied by the return of a completed survey.

**Data analysis**

Medians, interquartile ranges (IQR), frequencies and percentages were used to report the central tendency, spread and empirical distributions of the categorical variables. Statistical computations and comparisons (chi-squared) were conducted using the SPSS statistical software package. An alpha level of $p<0.05$ was considered statistically significant.

**Findings**

**Response rate**

The response rate was 89%, with 161 of the 181 surveys being completed and returned.

**Demographics**

Respondents were all female, aged predominantly 35–54 years, and most identified as being Australian born (138, 86%). There was an equal distribution of full-time and part-time workers. Most participants held specialist level positions (clinical nurse or above; 129, 80%) and had been working with parents of young children for 10 or more years (145, 90%). The majority held a child health nurse qualification (151, 94%) and all but two participants were involved in parent education (Table 3).

**Preference in terminology and sources of knowledge**

Participants identified a clear preference for the term “wrapping” over “swaddling” (116, 72% vs 25, 16%) with 90 (56%) participants indicating they believed there was a difference between the terms. The term wrapping will be used herein for ease of reporting results.

Over half of respondents (91, 57%) identified that they were from a culture that did not traditionally wrap babies. Although a third of the sample identified that they were from a culture that traditionally practised wrapping in the home, only 19% (30) had learned about wrapping from their immediate family. Other sources of knowledge about wrapping were identified as originating from midwifery (93, 58%), child health (22, 14%), or paediatric nursing (9, 6%) practice.
Table 3: Sample demographics

<table>
<thead>
<tr>
<th>Demographic variable</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>161</td>
<td>100</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25–34 years</td>
<td>9</td>
<td>5.6</td>
</tr>
<tr>
<td>35–44 years</td>
<td>47</td>
<td>29.2</td>
</tr>
<tr>
<td>45–54 years</td>
<td>69</td>
<td>42.9</td>
</tr>
<tr>
<td>≥ 55 years</td>
<td>36</td>
<td>22.4</td>
</tr>
<tr>
<td><strong>Cultural background</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australian</td>
<td>138</td>
<td>85.7</td>
</tr>
<tr>
<td>British</td>
<td>11</td>
<td>76.8</td>
</tr>
<tr>
<td>European</td>
<td>4</td>
<td>2.5</td>
</tr>
<tr>
<td>African</td>
<td>4</td>
<td>2.5</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Employment status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>73</td>
<td>45.3</td>
</tr>
<tr>
<td>Part-time</td>
<td>74</td>
<td>46</td>
</tr>
<tr>
<td>Casual</td>
<td>14</td>
<td>8.7</td>
</tr>
<tr>
<td><strong>Post-registration experience</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–4 years</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>5–9 years</td>
<td>13</td>
<td>8.1</td>
</tr>
<tr>
<td>10 or more</td>
<td>145</td>
<td>90</td>
</tr>
<tr>
<td><strong>Involvement in parent education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>159</td>
<td>98.8</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>1.2</td>
</tr>
<tr>
<td><strong>Length of time working with parents of young infants</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–4 years</td>
<td>5</td>
<td>3.1</td>
</tr>
<tr>
<td>5–9 years</td>
<td>28</td>
<td>17.4</td>
</tr>
<tr>
<td>10 or more years</td>
<td>128</td>
<td>79.5</td>
</tr>
<tr>
<td>*<em>Practice areas</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child health clinic</td>
<td>86</td>
<td>53.4</td>
</tr>
<tr>
<td>Home visiting</td>
<td>44</td>
<td>27.3</td>
</tr>
<tr>
<td>Residential care</td>
<td>35</td>
<td>21.7</td>
</tr>
<tr>
<td>Parent education groups</td>
<td>20</td>
<td>12.4</td>
</tr>
<tr>
<td>Child health line</td>
<td>11</td>
<td>6.8</td>
</tr>
<tr>
<td>Parent management or education/early feeding clinic/management</td>
<td>19</td>
<td>All &lt; 5%</td>
</tr>
<tr>
<td><strong>Highest level of education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-registration certificate</td>
<td>57</td>
<td>35.4</td>
</tr>
<tr>
<td>Diploma/degree</td>
<td>53</td>
<td>32.9</td>
</tr>
<tr>
<td>Postgraduate certificate</td>
<td>52</td>
<td>32.3</td>
</tr>
<tr>
<td>Postgraduate diploma</td>
<td>30</td>
<td>18.6</td>
</tr>
<tr>
<td>Masters</td>
<td>7</td>
<td>4.3</td>
</tr>
<tr>
<td>Enrolled nurse</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>*<em>Speciality qualifications</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child health</td>
<td>151</td>
<td>93.8</td>
</tr>
<tr>
<td>Midwifery</td>
<td>132</td>
<td>82</td>
</tr>
<tr>
<td>Lactation consultant</td>
<td>37</td>
<td>23</td>
</tr>
<tr>
<td>Paediatric</td>
<td>20</td>
<td>12.4</td>
</tr>
<tr>
<td>Mental health/neonatal/immunisation/health promotion/community health/continence/management/family planning</td>
<td>32</td>
<td>All ≤ 5%</td>
</tr>
</tbody>
</table>

* Multiple responses possible
Knowledge and attitudes

Participants responded to questions about the usefulness, advantages and disadvantages associated with wrapping babies.

Most participants identified that the practice of wrapping was most helpful for babies aged between birth and three months (144, 89%). More than 70% of participants identified positive effects of infant wrapping including increased feelings of security (138, 86%), calming (133, 83%), reduced startle reflex (118, 73%) and improved settling to sleep (110, 68%). Less well identified were advantages relating to increased duration of sleep (80, 50%), reduced crying (53, 33%), reduced colic symptoms (16, 10%) and improved neuromuscular and behavioural development in premature babies (15, 9%). Less than a third of participants were aware that wrapping was an evidence-based strategy to support supine positioning (49, 30%) (Figure 1).

Participants identified their main concern with wrapping as being the risk of overheating (115, 71%). The risk of developing an infant sleep association (68, 42%); impaired normal development (53, 33%); increased risk of SIDS (42, 26%); compromised respiratory function (33, 21%); increased risk of suffocation (32, 20%), and hip dysplasia (9, 6%) were each identified as potential risks associated with infant wrapping. Less than half (66, 41%) of the participants correctly identified that there were no negative effects as long as the infant was "safely" wrapped.

When asked to identify what type of material was suitable for wrapping a baby, more than 90% of participants (144, 93%) identified that the appropriate material for a wrap would be a light cotton or muslin, with 28 (17%) considering that flannelette or cotton air cell blankets were also appropriate. Over half the respondents (92, 57%) correctly identified that the subtropical Queensland climate did not pose a problem as long as the infant was lightly clothed in summer, while 45 (28%) participants indicated that they knew the difference between safe versus "unsafe" wrapping practices.

Participants were asked if they were familiar with "safe" and "unsafe" wrapping practices. Most participants (114, 71%) indicated that they knew the difference between safe versus unsafe wrapping techniques; however, 32 (20%) respondents were unsure. Participants were asked to express their understanding of the SIDS and Kids guidelines regarding wrapping in the context of parent education if parents chose to wrap their baby. Less than half (46% or less) of the sample correctly identified SIDS and Kids recommendations relating to safe wrapping in terms of advised infant sleep position. Less than a third (47, 29%) of participants were aware that SIDS and Kids supported the practice of wrapping as an infant settling strategy (Figure 2) while a quarter (40, 25%) were unsure of existing guidelines. Participant education levels or years of experience were not significantly associated with awareness of SIDS and Kids recommendations.

Prior to this study no official policy guidelines existed in relation to wrapping practices in Queensland; an issue identified by 121 (75%) respondents. Most respondents (147, 91%) agreed that development of evidence-based policy guidelines would be useful in supporting their clinical practice.

Practice

Most CHNs (126, 78%) reported that they would initiate wrapping as an infant settling strategy if appropriate to the family’s circumstances. CHNs were significantly more likely to discuss the practice and aspects of wrapping with parents of an infant less than three months old on a “frequently” basis (139, 86%) compared to parents of an older infant (3–6 months) (69, 43%) (chi-squared test statistic = 51.08, df 9, p<0.0001).

The most frequently identified wrapping style was for the wrap to be firmly or tightly folded around the infant and loosened with development to allow arm movement (45, 28%), with the arms flexed and loosely contained (59, 37%). Approximately one half of the respondents (84, 52%) responded with a wrapping style consistent with evidence. The remaining 48% (77) were unsure, did not have a style of wrapping, or selected a loosely folded wrap; responses that were not consistent with evidence-based principles of safe wrapping.

For parents who chose to wrap their baby, few CHNs reported that they would discourage the practice (9, 6%) although some would also suggest alternative settling strategies (65, 40%). Almost a third identified that they would support the parent’s decision (46, 29%) and most would discuss safe wrap techniques with the parents (129, 80%). Over half (92, 57%) the group identified they would specifically discuss SIDS and Kids Australia recommendations; but interestingly there were just 72 (45%) respondents who had demonstrated awareness of a SIDS and Kids position statement about infant wrapping.

To further determine CHN wrapping practice with regard to infant age, participants were asked what their recommendations would be for management of a situation
where a two-month-old was being settled in the prone position by his/her parents. Most (101, 63%) identified that they would recommend to the parents the use of the supine sleep position, with the infant wrapped, as an alternative to prone positioning. However, 60 (37%) of the sample either would not, or were unsure about, recommending wrapping in this situation. When asked what their parent advice would be for a similar situation but with an older baby (four months) who was rolling to prone during sleep, only 11 (7%) participants reported that they would recommend a trial of wrapping to keep the infant on the back during sleep (Figure 3). Almost a third (50, 31%) would not recommend wrapping to support back positioning for this older infant. CHNs were significantly more likely to advise parents to try wrapping to support supine positioning for a younger infant aged two months than compared to advice for parents with an older infant aged four months or more (63% vs 7%) (chi-squared test statistic = 15.45, df 4, p=0.004).

Discussion
The findings from this study identified a wide variation in CHNs’ knowledge, attitudes and practices relating to wrapping as a strategy to: a) promote infant settling and sleep; and b) encourage babies to sleep on their backs, consistent with public health recommendations.

Knowledge and attitudes
Most participants reported having developed their knowledge base about wrapping from their practice. At the time of this study there were no state guidelines for infant wrapping in place. In the absence of guidelines it is possible that this informal passage of knowledge was neither comprehensive nor evidence-based. SIDS and Kids Australia had developed a position statement supporting infant wrapping according to safe principles as a strategy to support supine positioning for sleep in 2005\(^5\), available on their website, but participants demonstrated poor awareness of this.

Most respondents indicated that they were aware of safe and unsafe wrapping practices; however, less than half of the group were aware of the SIDS and Kids position statement and a quarter reported use of a wrapping style that was not recommended by evidence at the time. The suitability of light cotton and muslin wraps for wrapping babies in most climates was well known; however, a third of nurses reported that the Queensland climate inhibited the utilisation of wrapping as an infant care strategy. Dressing an infant appropriate to the environment is an important consideration for caregivers as overheating is a risk for sudden infant death if an infant is too heavily dressed under a wrap, particularly if the head is also covered\(^5\). For warmer climates, minimal dressing of an infant prior to wrapping (singlet and nappy) is advised, and does not preclude wrapping\(^5\).

Most nurses indicated that the first three months of life was the developmental period in which wrapping a baby was the most helpful. The term “wrapping” was preferred in practice with the terms themselves invoking responses whereby “swaddling” was generally interpreted as being a more restrictively applied cloth, or alternatively, a very loose bundling of material, with or without head covering. Only half of the respondents identified the preferred response of “wrapping” being “cloth firmly folded around the infant”. These findings did indicate that education regarding the practice was necessary to avoid the unsafe extremes (wrap being applied too loosely or too tightly)\(^5\). A variety of applications of the practice of wrapping were identified with over half of respondents using a technique that allowed for infant development in which there was increasing arm freedom or arm placement near the mouth before ceasing wrapping altogether. Wrapping techniques need to be tailored to the infant and individual practitioners may have their own preferences in the style used; however, practice should be consistent with basic principles of safe wrapping.

Most nurses correctly identified the absence of state organisational or district policy guidelines regarding the practice of infant wrapping while the vast majority (>90%) reported that evidence-based guidelines should be developed. These results suggest that nurses may be more inclined to advocate and implement an evidence-based practice such as safe infant wrapping if policy guidelines have been developed, endorsed and disseminated by their organisation.

Practice
The majority of study participants were very experienced in child health and nearly all worked within roles that involved education. The potential for this practice group to impart information and support recommendations within the community is great. The importance for the information to be evidence-based and current is, therefore, vital. Most nurses advocated wrapping as a settling and sleep strategy from “sometimes” to “frequently” in their practice, and were more likely to discuss these strategies with parents of younger infants, aged less than three months. Most CHNs indicated that if a parent chose to wrap their infant that they would discuss safe wrapping techniques, while interestingly only a third of respondents identified that they would actively support the parent’s decision to wrap.
Most CHNs indicated they would recommend infant wrapping as a strategy to support supine sleep as an alternative to prone positioning for a two-month-old infant; however, a considerable proportion (about a third) would not suggest use of this strategy to parents as an alternative to prone, despite the evidence to support it\textsuperscript{2,54}. Sudden infant deaths occur most frequently in the first six months of life, with a peak between two and four months of age\textsuperscript{55}. With indisputable evidence that supine sleep positioning has been a key contributor in the reduction in sudden infant deaths globally, all caregivers should be made aware of the importance of settling babies to sleep on their back, from birth\textsuperscript{25,58}. Wrapping is a safe and effective strategy to promote supine sleep positioning that CHNs should be aware of to share with parents, particularly if they are having difficulty with infant settling and sleep.

CHNs were also significantly less likely to suggest to parents a trial of wrapping for an older infant of four months who was rolling prone during sleep, compared to younger infants, aged two months. However, evidence suggests that wrapping is a strategy that potentially has a role in situations where supine sleep positioning could be prolonged if the infant was wrapped appropriately for their developmental level\textsuperscript{2,54}. For example, once the startle reflex disappears the baby's legs and torso can be wrapped firmly (not tightly) in a flexed position with hands free to facilitate self-soothing behaviours to promote supine settling and sleep\textsuperscript{57}.

**Strengths and limitations**

This study achieved an excellent response of 89%, and was representative of the knowledge, attitudes and practices of CHNs from nine health services in south-east Queensland. It provided important benchmarking data for infant wrapping prior to the development of practice guidelines. As the study was conducted amongst a child health nursing sample, further research amongst other nursing, allied and medical health professionals who provide education and advice to parents of infants would also be valuable. The timing of this study was opportune, as findings were used to inform the development and implementation of statewide policy relating to safe infant care practices to reduce the risk of SUDI\textsuperscript{5} and directly contributed to the development of a SIDS and Kids Information statement\textsuperscript{57} *Wrapping babies*. Health professional practice tools and educational materials that incorporate safe infant wrapping practices have been developed in collaboration with research team members, health department policy advisors and SIDS and Kids, and have been reported elsewhere\textsuperscript{48}. While surveys have been demonstrated to be a valid and reliable method of obtaining information about the knowledge and attitudes of respondents relating to a particular practice issue\textsuperscript{46,47}, there are inherent difficulties recognised with the collection of information in this manner due to the need to self-report practice data\textsuperscript{48}. Audits of practice are also required but were beyond the scope of this cross-sectional survey study.

**Conclusions**

This study aimed to investigate the extent to which health professionals were aware of, and utilise, infant wrapping as a safe settling and sleep strategy. With the incidence of prone sleep positioning in the region where this study was conducted being one of the highest in Australia\textsuperscript{48}, and with Indigenous infants significantly less likely to be placed in the recommended supine sleep position than non-Indigenous infants\textsuperscript{49}, this issue has important practice implications. Many parents choose to place infants prone to sleep because they perceive it as being more comfortable and conducive to improved sleep for the infant\textsuperscript{50}. Some parents may choose prone positioning because they are unaware of an alternative settling strategy. However, wrapping in the supine position calms infants and improves settling to sleep, facilitating maintenance of the supine sleep position, a recognised risk reduction factor for sudden infant death\textsuperscript{20-22}. Of particular concern was that, despite the evidence, almost a third of nurses would not recommend wrapping to encourage supine sleep with two-month-old infants whose parents are choosing to settle them prone when those infants are within the developmental age associated with the greatest risk of SUDI; between two and four months. This finding supports previous studies which have suggested that contributing factors to Queensland's high prone sleeping rate for young babies may be due to poor awareness of, or a failure to promote, safe infant settling and sleep strategies\textsuperscript{2-6,41}, which include safe infant wrapping.

Study results highlighted areas for knowledge and practice improvements in child health nursing related to the practice of wrapping infants, especially as a strategy to support the use of the supine sleep position for young infants less than six months of age. Knowledge content areas which required improvement include: principles of safe wrapping; advantages of safe infant wrapping; potential disadvantages if safe wrapping principles are not followed; and appropriate infant age, developmental stage, wrapping materials and styles. Practice areas which reported a wide variation in responses included parental advice, support and frequency of education provision, particularly where it may be appropriate to suggest to a trial of infant wrapping to assist settling and support the supine sleep position as an alternative to prone; consistent with safe sleeping recommendations.

CHNs are a primary resource for support and advice for parents. This study provides the first Australian benchmarking data of nursing practice related to infant wrapping. Study results have identified knowledge and practice deficits related to the use of infant wrapping as a safe settling and sleep strategy to support safe sleeping messages in a sample of CHNs from nine health service districts. These deficits have been demonstrated to impact on the quality of information provided to parents. Study results have also identified a need for the development of evidence-based practice guidelines for CHNs to promote consistency in practice, parent advice and education that would help to further reduce the risk of SUDI. As a result of this study, the authors have since...
collaborated with SIDS and Kids National Scientific Advisory Group to develop national evidence-based guidelines for safe infant wrapping\(^7\). There is a need for further investigation into the impact that an educational intervention based on evidence-based guidelines for safe infant wrapping would have on CHN knowledge and practice.

**Implications for practice**

- CHNs are an important information source for parents.
- Prone position is a risk factor for SUDI.
- Wrapping strategies based on principles of safe infant wrapping can assist parents to settle their babies in the recommended supine infant sleep position.
- This study provides benchmarking data of CHNs’ knowledge, attitudes and practices relating to infant wrapping as an infant settling strategy and risk reduction strategy for SUDI.
- Evidence-based information and guidelines will promote consistent practice by CHNs.
- Consistent, evidence-based information use by parents in caring for their baby will reduce the risk of SUDI.

**References**


32. Royal Children's Hospital, Melbourne. Wrapping your baby safely
29. Yurdakok K, Yavuz T, Taylor C. Swaddling and Acute Respiratory
epidemiological changes in sudden infant death syndrome: a 20
year population-based study in the UK. Lancet. [Internet] 2006
27. Sullivan FM, Barlow SM. Review of risk factors for Sudden Infant
25. Beal SM, Finch C. An overview of retrospective case-control studies
investigating the relationship between prone sleeping position and
24. Richardson HL, Walker AM, Horne RS. Influence of Swaddling
Experience on Spontaneous Arousal Patterns and Autonomic
Feb 12];157(1):85–91. doi.org:/10.1016/j.jpeds.2010.01.005
23. Bystrova K, Mattheisen AS, Widstrom AM, Ransjo-Arvidson AB,
Welles-Nystrom B, Vorontsov I, Uvnas-Moberg K. The effect of
Russian maternity home routines on breastfeeding and neonatal
weight loss with special reference to swaddling. Early Hum Dev.
22. Royal Children’s Hospital, Melbourne. Wrapping your baby safely
to help prevent developmental dysplasia of the hip-VIDEO.
Kids Health Info. Department of Education and Early Childhood
Development, 2012. Content developed by Orthopaedics at The
rch.org.au/kidsinfo/factsheets.cfm?doc_id=15342
T. Association of swaddling, rickets onset and bone properties
2006;120(9):834–840.
20. Blair PS, Sidebotham P, Evasion-Coome B C, Edmonds M, Heckstall-
Smith EM, Fleming P. Hazardous co sleeping environments and risk
factors amenable to change: case-control study of SIDS in South
doi:10.1136/bmj.b3666
19. International Society for the Study and Prevention of Perinatal and
Infant Death. (ISPID). Statement on Swaddling. To Swaddle or Not
ispid.org/swaddling.html
18. Richardson HL, Walker AM, Horne RS, Influence of Swaddling
and-primary-care-providers/
hipdysplasia.org/for-physicians/pediatricians—
and-primary-care-providers/
bedding does baby need? 2012 [cited 2013 Feb 12]. Available from:
http://www.sidsandkids.org/
15. International Hip Dysplasia Institute. Official IHD Position
Statement on Hip-Healthy Swaddling, [cited 2013 Feb 12]. Available from:
Swaddling: will it get babies onto their backs to sleep? Clin
forum to review the evidence underpinning the recommendations
of the Australian SIDS and Kids Safe Sleeping Health Promotion
Programme, October 2010. Paediatr Child Health. [Internet]
2012 [cited 2013 Feb 12];48:626–633. doi.org:/10.1111/j.1440-
1754.2011.02215.x
12. American Academy of Pediatrics. SIDS and Other Sleep Related
Infant Death: Expansion of Recommendations for a Safe Infant
Sleeping Environment. Task Force on Sudden Infant Death
Syndrome [Internet] 2012 [cited 2013 Feb 12]. Available from:
http://pediatrics.aappublications.org/content/early/2011/10/12/
peds.2011-2284
SIDS Council of Australia. 2009 [cited 2013 Feb 12]. Available from:
http://www.sidsandkids.org/safe-sleeping/information-statements/
10. Young J, Williams A, Ramsbotham J, Higgins N. Consistent
and collaborative approaches to reduce preventable deaths: a
Safe Infant Sleeping educational resource designed for health
9. Young J, O’Rourke P. Improving attitudes and practice relating
to sudden infant death syndrome and Reduce the Risk messages.
The effectiveness of an educational intervention in a group of nurses
8. Imle M, Atwood J. Retaining qualitative validity while gaining
quantitative reliability and validity: Development of the transition
7. Statistical Package for Social Scientists [SPSS] Version 11.0.0 for
Skerman H, Najman J. Improving pain management by nurses: A
pilot peer intervention program. Nurs Health Sciences. 2001;3:35–
45.
5. Manworren R. Pediatric Nurses’ Knowledge and Attitudes Survey
4. Young J, Battistutta D, O’Rourke P, Thompson JMD. Final Report:
Infant care practices related to Sudden Infant Death Syndrome
in Queensland 2002. Queensland Health, Brisbane: Royal Children’s
Hospital & HSD; 2008.
3. Young J, New K, Colditz P, Williams A. Safe Sleeping Education
Program for Health Professionals. Brisbane: Queensland Health;
2006.
2. Willinger M, Ko CW, Hoffman HJ, Kessler RC, Corwin MJ. Factors
associated with caregivers’ choice of infant sleep position, 1994–
1998: the National Infant Sleep Position Study. JAMA. [Internet]
2135
1. Manworren R. Pediatric Nurses’ Knowledge and Attitudes Survey

Volume 16 Number 3 – November 2013

11
Relationship between maternal total protein and maternal measles antibodies of mother–infant pairs at the University of Maiduguri Teaching Hospital, Borno, Nigeria

Baba Usman Ahmadu*
Consultant paediatrician, Department of Paediatrics, Federal Medical Centre Yola, Adamawa State, Nigeria. PMB 2017, Yola, Adamawa State, Nigeria Email: ahmadu4u2003@yahoo.com

Ashir Garba Mohammed
Consultant and Senior Lecturer

Mustapha Modu Gofama
Consultant and Senior Lecturer

Malgwi Esther
Chief Medical Officer

Sajor Njidda
Chief Medical Officer

* Corresponding author

Abstract

Background Maternal measles antibodies (MMA) of mother–infant pairs are immunoglobulins, and constitute part of the total protein component of the blood. A relationship could exist between maternal total proteins (TPR) and MMA of mother–infant pairs because adequate maternal TPR may generate high levels of MMA. However, there is a paucity of literature on this topic; therefore, this work aimed at studying the relationship between maternal TPR and MMA of mother–infant pairs at the University of Maiduguri Teaching Hospital (UMTH), Borno, Nigeria.

Methods We conducted a hospital-based comparative cross-sectional study of 160 mother–infant pairs recruited from the labour ward of the UMTH, using the systematic random sampling method. Maternal TPR using Biuret method and MMA by enzyme linked immunosorbent assay (ELISA) were determined from these subjects. Student t-test was used to investigate the effect of mean maternal TPR on MMA. The relationship between maternal TPR and MMA was investigated by correlation analysis.

Results There were 82/160 (51.3%) males and 78/160 (48.7%) female newborn infants. The mother’s and the infant’s MMA were positively correlated (p=0.011). Higher mean MMA was observed with normal maternal TPR in mother–infant pair compared to those of low maternal TPR; however, this relationship was not significant.

Conclusion Normal maternal TPR generated high MMA in mother–infant pairs compared to that produced by low maternal TPR; however, this relationship was not significant. Further work on the relationship between MMA and maternal TPR is hereby recommended.

Keywords: Maternal total proteins, maternal measles antibodies, mother–infant pairs, Borno state, Nigeria.

What is known about this topic

- Measles remains a major cause of childhood morbidity and mortality mostly in developing countries. MMA are passively mediated immunity derived from proteins, and are conveyed from the mother to the foetus, mostly during the third trimester of pregnancy.
- The relationship between maternal TPR and MMA still remains a debatable issue, because some authors have argued that low maternal TPR could yield to low MMA, whereas elevated maternal TPR may yield to increase MMA levels.

What this paper adds

- From our observation in which Mother–infant pairs that had normal TPR had higher levels of MMA compared to mother–infant pairs with low TPR. The gap in knowledge in this subject may have been narrowed and a direct linear relationship could exist between maternal TPR and MMA if future study design accommodates confounders that were stated as limitations of our study. As such, this work could serve as a template for future research works.
Declarations

Authors’ contributions: Each author has participated actively and sufficiently in this study. BUA conceived the idea and design the study, interpreted the data, and drafted the manuscript. BUA, AGM, MMG, MED and SJN analysed, interpreted the data, revised the manuscript and provided final approval of the paper.

Competing interests: The authors certify they have no commercial associations, for example, consultancies, stock ownership, equity interests, patent-licensing arrangements and so on that might pose a conflict of interest in connection with the submitted article. All authors also declare they have no conflict of interest.

Ethical approval: The study protocol was reviewed and authorised by the UMTH Medical Research and Ethics Committee with approval no ADM/TH.75/VOL.II, and informed consent from parents was also obtained.

Guarantor: Baba Usman Ahmadu, Department of Paediatrics, Federal Medical Centre Yola, Adamawa State, Nigeria. PMB 2017, Yola, Adamawa State, Nigeria. Phone: +2348033668948 Email: ahmadu4u2003@yahoo.com

Acknowledgements: We thank doctors N Haruna, M Sandabe and J Usman for their assistance. We also appreciated Mr Bukbuk D, Dawurung JS and Adebayo Ayub-Eniola Ayodele of the Department of Immunology, and Chemical Pathology of the UMTH, for their technical help.

Funding source: The authors provided funding.

Introduction

Measles remains a major cause of childhood morbidity and mortality mostly in developing countries. This partly could be due to certain ideology: for instance measles is caused by heat and some attribute it to supernatural factors; as such the majority of children are treated with alternative or traditional medicaments. In addition, some sociocultural practices like clustering of houses and overcrowding found in these settings could again favour the spread of the measles virus (MV) in our population. Children receive routine measles immunisation in Nigeria at nine months of age and measles immunisation coverage for Nigeria is 62%. However, a study in Borno state, Nigeria, reported 46% measles immunisation coverage. Lack of adequate caregiver knowledge on the need to immunise their children may be responsible for the low measles immunisation coverage. Of note, recently is because the literacy rate in Maiduguri, Borno state, is low, linguistic interpretation of the informed consent form in local language (mainly Kanuri) was sought, and a parent’s signature or thumb print indicated consent. Parents had unlimited liberty to deny consent without any consequences and confidentiality was also maintained.

Design: The study was a hospital-based, comparative cross-sectional study of mother–infant pairs recruited from the labour ward of the UMTH. The hospital conducted 4,205 deliveries in 2010, which was the year the study group were recruited.

Ethical Issues: The study protocol was reviewed and authorised by the Medical Research and Ethics Committee of UMTH, and informed consent from parents was also obtained. Because the literacy rate in Maiduguri, Borno state, is low, linguistics interpretation of the informed consent form in local language (mainly Kanuri) was sought, and a parent’s signature or thumb print indicated consent. Parents had unlimited liberty to deny consent without any consequences and confidentiality was also maintained.

Subjects: The minimum sample size was determined using a statistical formula appropriate for detecting differences between two means when using paired sampling units: the effect size was set at 0.2, alpha level at 0.05 and power at 95%. However, 50% of the calculated minimum sample was added to maximise power. Therefore, the sample size for this study was 160 mother–infant pairs. A pregnant woman was eligible for participation in the study if she delivered at the labour ward of UMTH and met the following study inclusion
criteria: (i) had an uncomplicated single birth at term (based on fundal height); and (ii) had no known underlying chronic illness. Mothers who had a still birth or received blood transfusion during the third trimester of pregnancy were excluded from the study. This is due to the fact that a blood transfusion might boost MMA levels, which would give a falsely high level. Mother–infant pairs were enrolled in this study using the systematic random sampling method where the first of every three mother–infant pairs were sampled at the labour ward. On enrolment of the mother–infant pairs, study proforma were administered to the mothers to collect information on their bio-data, pregnancy history and antenatal care history.

Sample collection: Four millilitres (ml) of venous blood were obtained from the mothers on admission using sterile disposable 5 ml syringes under an aseptic technique. Of the 4 ml of maternal venous blood drawn, 2 ml was placed in a plain, sterile bottle. This blood was used for the estimation of TPR concentration in grams per litre (g/l) using the Biuret method. Low TPR is defined as TPR<64 g/l, while normal range of TPR is TPR (64–83) g/l. Sera obtained from the remaining 2 ml of maternal venous blood were used to measure MMA using enzyme linked immunosorbent assay (ELISA).

Three ml of blood was obtained from the umbilical cord. The blood was centrifuged to enable collection of serum. Serum was stored at −20°C until MMA assay was performed. Levels of MMA were measured by ELISA (Demeditec diagnostic GmbH Kiel Germany), which has a sensitivity of 99% and specificity of 100%, in accordance with standard laboratory practice. The ELISA well plates were coated with Edmonston MV strain and results were presented in units per millilitre (U/ml). Levels of MMA ≤12 U/ml were classified as negative, and positive when levels are >12 U/ml. On the basis of these recommendations, protective titres for MMA were defined as the levels of MMA >12 U/ml, and unprotective titres as levels of MMA ≤12 U/ml.

Table 1: Mean MMA distribution of mother–infant pairs at birth

<table>
<thead>
<tr>
<th>Mother–infant pairs</th>
<th>MMA (U/ml)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mothers</td>
<td>134.61 ± 93.22</td>
<td>120.05–149.16</td>
</tr>
<tr>
<td>Newborn infant</td>
<td>185.89 ± 85.97</td>
<td>172.47–199.31</td>
</tr>
</tbody>
</table>

SD = Standard deviation   CI = Confidence interval

Table 2: Comparison of maternal TPR and mean MMA of mother–infant pairs

<table>
<thead>
<tr>
<th>Maternal TPR (g/l)</th>
<th>Mean maternal measles antibodies ± SD (U/ml)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal TPR (TPR (64–83))</td>
<td>136.74 ± 94.40 Mothers, 182.64 ± 87.83 Newborn infants</td>
<td>0.000*</td>
</tr>
<tr>
<td>Low TPR (TPR &lt;64)</td>
<td>117.32 ± 59.19 Mothers, 175.98 ± 53.29 Newborn infants</td>
<td>0.000*</td>
</tr>
<tr>
<td>p value</td>
<td>0.210</td>
<td>0.641</td>
</tr>
</tbody>
</table>

TPR = Total protein   *=p value <0.05 (significant)

Results

One hundred and sixty mother–infant pairs were enrolled in this study. There were 82/160 (51.3%) males and 78/160 (48.7%) female newborn infants. The male to female ratio is 1.05:1. Table 1 shows that the mean MMA level of mother–infant pairs was 134.61 ± 93.22 for mothers, and 185.89 ± 85.97 for their newborn infants. The ratio of mean MMA of mother–infant pairs is 1:1.4.

Forty-three (26.9%) mothers were found to have low TPR, whereas 117/160 (73.1%) of them had acceptable TPR levels. Overall, mean maternal TPR was 73.36 ± 20.07 (95% CI, 70.22–76.49). Table 2 shows mean MMA levels of mother–infant pairs that correspond to the levels of maternal TPR. Mother–infant pairs that had normal TPR had higher levels of MMA compared to mother–infant pairs with low TPR. This, however, was not significant.

Table 3 shows correlation of MMA of mother–infant pairs and maternal total protein. There was a positive significant correlation observed between MMA of mother–infant pairs (p=0.011) in this study. Also a positive correlation was found between MMA of the mothers and maternal TPR; however, this relationship was not significant.

Discussion

There were high MMA in mother–infant pairs at birth in this study, and the newborn infants had greater levels of MMA than their corresponding mothers. This corroborated reports from the Center for Disease Control and Prevention,
Table 3: Correlation of measles antibodies of mother–infant pairs and maternal TPR

<table>
<thead>
<tr>
<th>Maternal TPR (g/l)</th>
<th>Mothers MA (U/ml)</th>
<th>Newborns MA (U/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal TPR (g/l) r</td>
<td>0.028</td>
<td>–0.042</td>
</tr>
<tr>
<td>p</td>
<td>0.724</td>
<td>0.599</td>
</tr>
<tr>
<td>Mothers MA r</td>
<td></td>
<td>0.200</td>
</tr>
<tr>
<td>(U/ml) p</td>
<td></td>
<td>0.011 *</td>
</tr>
</tbody>
</table>

TPR = Total protein  MA = Measles antibodies  *= p value < 0.05 (significant)

r = correlation coefficient

Atlanta, Georgia, and a study carried out in Peru6,11. The energy-dependent transport mechanism for MMA in mother–infant pairs could be the reason for newborn infants having increased MMA than their mothers. Previous studies further associated the high levels of MMA of newborn infants to active placental passage of MMA from mother to foetus8,11. The high MMA titre observed in our study group showed similarity with that reported by Gendrel et al.14 in Gabon, and other regions of Africa, especially Sub-Saharan Africa2–6. Measles being endemic in this region could be the reason for elevated titre of MMA found in our study population. Of note is that similar findings were also observed during measles pre-immunisation era, even in developed countries5. However, with the advent of measles immunisation, values lower than that seen during pre-immunisation era but still protective against MV became more pronounced. Furthermore, mothers who had measles immunisation in Connecticut, USA, had lower MMA than that observed in the era of pre-measles immunisation6. In another study in the United Kingdom, researchers found high MMA among unvaccinated mothers compared to those who were vaccinated15.

Although mother–infant pairs that had normal maternal TPR had elevated MMA relative to those with low maternal TPR, this comparison was not significant in this study. Similar observation was made by other workers in Bombay, and a reason for this could be that MMA being immunoglobulins, constitute a small fraction among other components of TPR16. Therefore, changes whether low or high to only MMA among these other components of TPR may not be significant. On the contrary, another study possibly demonstrated a direct linear relationship between MMA and maternal TPR11. Total proteins and MMA (immunoglobulins) could demonstrate a phenomenon called polymorphisms, where these can exist in two different phenotypes16. Maternal TPR and MMA demonstrating phenotypic mixing would be able to increase MMA in subjects. Moreover, MMA constitute an individual humoral immunity and may not be significantly impared by low maternal TPR, because mothers possessing low TPR could still generate high MMA in response to contact with MV4,6. Mothers who participated in this study lived in a measles endemic environment1–6,9. Therefore, the boosting effect of MV could increase mean MMA even in the presence of low maternal TPR. This phenomenon is achieved by generating high MMA levels from continuous immunological stimulation by MV in a measles endemic setting1,3,4.

Limitations of the study

Our inability to establish other possible factors such as maternal measles immunisation status or maternal past measles infection as most mothers could not recall such events, remains a drawback of this study. These limitations may have affected the adequate comparison of MMA of mother–infant pairs with maternal TPR. Future research incorporating these aspects is hereby advocated.

Conclusion

Normal maternal TPR generated high MMA in mother–infant pairs relative to that produced by low maternal TPR; however, this relationship was not significant in the current study.

References

The perspectives of young people on their use of alcohol and risks at school leavers festivals

Alison Hutton*
Associate Professor, School of Nursing and Midwifery, Flinders University GPO Box 2100 Adelaide SA 5001
Alison.hutton@flinders.edu.au

Lynette Cusack
Senior Lecturer, School of Nursing, University of Adelaide, RAH - Eleanor Harold Building, Adelaide SA 5001
*Corresponding author

Abstract
Schools leavers festivals (SLFs) are common across Australia. The SLF is an organised event where young people go to celebrate the end of their schooling. Past research has shown that school leavers often drink alcohol as a form of celebration during this time. This paper presents the findings from a study undertaken to explore the way in which young people prepared to minimise and/or be free from alcohol-related harm at the Adelaide SLF, in South Australia. Data was generated through the retrospective accounts of 38 young people during seven separate focus groups. Our study demonstrated that young people did not access health information to minimise alcohol-related harm. However, the data gained showed that young people plan what type of alcohol they intend to drink and who they are going to drink alcohol with to celebrate the SLF. This study highlights the great length that participants went to planning and budgeting for their purchase of alcohol. For participants in this study peers were people that they could trust. As well as valuing peers, on-site volunteers, mainly made up of other young people, were also valued in supporting their health care needs at the SLF.

What is known about this topic

- Past research has shown that school leavers often drink alcohol while celebrating during school leaver festivals (SLF).
- SLFs are commonly referred to as a ‘rite of passage’ for young people.
- Young people are influenced by their peers in how they behave during SLF.

What this paper adds

- Harm reduction strategies need to acknowledge that school leavers attend these festivals with the intent to celebrate with alcohol.
- Health promotion strategies need to include the development of strategies that can lead to a safer and more supportive environment in which alcohol-related harm for young people is minimised.
- This paper gives an insight into adolescents celebrating with alcohol from their perspective.
‘Skolarsluting’ is celebrated once school is completed. SLFs such as these often rely on the provision of on-site health care treatment services to respond to casualties as they present.

Experimentation with alcohol and other drugs is often seen as a normal part of adolescent development. Contemporary research states that the late teens is the time when there is the highest prevalence of risky behaviour, often fuelled by alcohol, often considered a normal part of development. Most school leavers are of a legal drinking age in Australia, which is 18. However, alcohol remains second to smoking in its contribution to preventable health and social costs in Australia. Young people do contribute to this number, with patterns of potentially harmful alcohol use. Interestingly, adolescents may not consider the use of alcohol as a serious health issue or even a contributor to risky behaviour. For example, Arnett has found that adolescents may associate alcohol to behaviour that is pleasurable and low risk.

Events such as SLFs becomes one of the first places that adolescents can assert their independence from their parents and the school community by legally engaging in the use of alcohol. This ‘rite of passage’ celebration becomes symbolic for teenagers as they transition into the adult world. Paradoxically, becoming independent of parental bounds is an expectation of adolescence in Western society and the notion of rite of passage associated with SLF is often where this independence is formally tested for the first time.

Design and methods

The research presented in this article invited young people aged 18 or over to provide a retrospective account of how, why and from where they sought health information prior to attending an SLF. In addition, the aim of the research was to determine if young people attending SLFs used strategies to minimise and/or be free from alcohol-related harm prior to attending an SLF. Furthermore, the researchers wanted to discuss the type and content of information adolescents may have accessed and its relevance and applicability to the SLF. Lastly, the aim of the research was to find out why and from where young people have sought health information and/or strategies to minimise and/or be free from alcohol-related harm prior to attending an SLF. The same core group of questions was used at each focus group (Table 1).

The reason for wishing to understand what types of health information Schoolies sought was to analyse the extent and intent of young people to prepare themselves to minimise and/or be free from alcohol-related harm while attending an SLF. This study was conducted as a direct consequence of previous research, which found that 50% of young people who presented to health care provided at the site of SLF drank at dangerous levels (more than five standard drinks). Therefore the goal of this study was to make recommendations that would inform the development of context-specific health promotion strategies that aim to reduce alcohol-related harm at SLFs.

<table>
<thead>
<tr>
<th>Table 2: Focus group participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus group number</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Method

To explore how young people use health messages to prepare for a Schoolies’ event a qualitative method was used (p. 115). A qualitative methodology was chosen to gain a deep understanding of the research problem, namely how young people accessed health information prior to attending Schoolies.

To examine how young people prepared for SLF, students from a university campus in South Australia were approached to voluntarily participate in focus groups. Focus groups lasted between 35 and 45 minutes. Members were guided by the set of questions listed in Table 1 and answers were taped and transcribed. Each session commenced with a safety statement, and each participant was invited to introduce themselves to the group as an icebreaker. Seven focus groups were conducted, with a total number of 38 participants. See Table 2 for a breakdown of each focus group.

<table>
<thead>
<tr>
<th>Table 1: Focus group questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>What did you do to organise yourself for this event?</td>
</tr>
<tr>
<td>Where and how did young people seek health information prior to attending the SLF?</td>
</tr>
<tr>
<td>Did you think about where you would get alcohol from and how much you would drink?</td>
</tr>
<tr>
<td>Explore the type and content of health information/strategies deployed by young people to minimise alcohol-related harm at SLF.</td>
</tr>
<tr>
<td>Is health promotion something that was thought through by young people whilst preparing to go to the SLF?</td>
</tr>
<tr>
<td>What were the important things you and your friends did to get organised before going to the SLF?</td>
</tr>
<tr>
<td>Explore the extent and nature of young people’s capacity to prepare themselves to minimise and/or be free from alcohol-related harm prior to attending an SLF.</td>
</tr>
<tr>
<td>What were the goals of the school leavers for the three days that they are there?</td>
</tr>
<tr>
<td>Explore what supports or strategies young people put in place to support their drinking or that of their peers while at the SLF.</td>
</tr>
<tr>
<td>What strategies did you use to minimise and/or be free from alcohol-related harm while attending an SLF?</td>
</tr>
<tr>
<td>Did you or your friends drink? If so, did it lead to any harm?</td>
</tr>
<tr>
<td>Did you or your friends support anyone who did get drunk? If so, in what way?</td>
</tr>
<tr>
<td>Is there any advice you would give to future school leavers about keeping safe and preparing for an SLF?</td>
</tr>
</tbody>
</table>
The aim of the focus groups was to explore the way in which young people prepare to minimise and/or be free from alcohol-related harm at SLFs. Participants were asked to discuss how, why and from where they sought information. In addition they were asked to discuss what strategies they use to minimise and/or be free from alcohol-related harm prior to attending the SLF. The researchers recruited students by handing out postcards and situating themselves at booths during the university’s orientation week. In addition, the study was advertised via posters and postcards around the university campus. Once it was ascertained whether the students attended the Adelaide schoolies festival within the last three years, they were invited to attend a semi-structured discussion in the form of a focus group. Ten focus groups were planned; however, seven were conducted due to data saturation. It became apparent early into data collection that our questions were answered; although perhaps not in the way that the research team had expected.

The criteria for participation was that the young person must have attended an SLF in the past two or three years and be between 16 and 23 years of age when they attended. The average age of Australian SLF participants is 17.7 years, so it is both appropriate and desirable to seek participants from this age demographic. All focus groups were audio-recorded, and all data transcribed verbatim. Ethics approval was sought and gained. All participants were 18 years or above, and were able to give informed consent.

**Interpretative analysis**

The use of focus groups facilitated an interactive group setting where participants were free to talk with other group members. Questions were semi-structured to promote discussion and to interview participants in a more natural setting than a one-to-one interview. Data from the focus groups were interpreted using thematic analysis. Thematic analysis is “a detailed and systematic recording of themes and issues” that is found in interview or focus group data. To analyse data, Braun and Clarke propose six distinct phases to be followed: familiarity with the data; identifying initial codes; search for themes, reviewed and refined themes, defining and naming themes followed by the final analysis and report write-up. In addition to thematic analysis, brief notes of the discussed concepts were taken during the focus groups, and then summarised at the end of the session in order for participants to validate the discussion undertaken during each focus group.

**Findings**

For most participants alcohol was integral to the participants’ experience of the SLF; the findings showed that participants planned to use alcohol; preferred to use alcohol with those they trusted; the behaviour of adolescents going into a dry zone (an area where drinking is banned); the associated outcomes that occurred while drinking alcohol, how participants supported each other whilst drinking and lastly how they appreciated the support of volunteers whilst at the SLF.

**Planning to drink alcohol**

When participants were asked what was a ‘must have’ at the SLF, alcohol was nominated by the majority of participants (n=35%). Some adolescents in this study appeared to put considerable time and effort into the organisation of alcohol prior to attending the SLF.

The girls I stayed with were pretty organised about their alcohol, what they were drinking, how much of it. We had a massive esky [cool box to keep alcohol cool] and they made their own punch so we had a massive thing of punch just for us. They had a lot of alcohol. (Female)

We got pretty much all of it before; about $500 worth. [Laughs] We didn’t even drink all of it but we just got so much. (Female)

Females in this study appeared to spend more time and energy organising and purchasing alcohol than males. Male participants stated they drunk ‘whatever’ (was nearby) and/or got their friends to buy them alcohol.

We didn’t plan our alcohol that much, we just brang [sic] what we brought and we got there, [then] we got a little bit more. (Male)

Whereas a female participant declared:

Yeah, I remember the [school] boarding house actually organised a meeting that went for about five hours deciding what alcohol we were going to spend our money on. (Female)

Planning meant deciding what drinks you would drink first at the SLF. For this purpose, vodka was the drink of choice for many Schoolies in this study:

Because you pay so much for accommodation and tickets and that, so you want nice [drinks] … (Female)

Others agreed:

Nice drinks were drunk first, followed by the cheap stuff … (Female)

By the time you’re drunk enough on the nice drinks, you can just go to goon cask wine and it just goes down really well anyway. (Female)

Vodka was also popular with school leavers due to its versatility as a drink:

When you mix it, it is really sweet and so it’s so nice to taste and goes down fast. You mix it with orange juice, anything you can lay your hands on. (Female)

**Trust and mateship**

Preparing to drink with people you trust and looking after your mates was important to the participants in this study. Participants stated that they chose to go to the SLF with people they liked, trusted and would contribute to look after each other if needed.

I think it’s really important to have people that you trust with you. I think that’s really important in those sorts of situations. Especially Schoolies because there’s just so many people around. There’s a lot of alcohol and drugs involved and so many people you don’t know. (Male)
Examples of mateship and trust given were that of being a designated driver, or willing to stay back at the caravan park with friends who may have had too much to drink.

Yeah when people did get bad at least one friend or something would look after them. There was a few that did get bad and so we had to stay behind with them. (Male)

I didn't really drink that much ... I was des driver, driving all of them around. (Female)

Yeah if there was someone that was bad anyone would help them I reckon. (Female).

Appreciating volunteers

Most participants commented on the presence and role of the Green Team, a group of volunteers, as an important element in creating a safe and supportive environment at Schoolies.

Young people described the Green Team as cognisant of young people's safety, relatable to young people, fun, never pushy, friendly and approachable:

... when we got there they were so cool. They helped us set up our tent. They sat down with us. (Female).

... it was really good to have a whole lot of people keep an eye out ... having sober people around. Just to keep an eye on. (Male)

I've had friends get walked all the way to caravan parks by the Green Team as well. If they wanted to walk, they would just walk them just to keep them safe. (Male)

Preloading and going to hospital

In an effort to maintain a safe environment for school leavers a dry zone is set up, meaning that no alcohol can be purchased or brought in to the ticketed festival. At times the dry zone affected Schoolies' behaviour through ‘loading up’ with alcohol prior to entering the event.

The main thing with alcohol was everyone was trying to skull drinks before the Schoolies' bus came so that you were drunk a sufficient amount of time at the festival. (Male)

... you drink before you get there and then you're completely smashed while you're there. (Female)

At times the excessive consumption of alcohol at the SLF meant that for some participants hospital became part of the Schoolies' experience for either themselves or for their friends.

She passed out when we were in the tent ... So she had to go to the hospital and get put on a drip and stuff. (Female)

There was a couple of guys in the caravan park, they had to go to hospital because they were really drunk at three o'clock in the afternoon. (Female)

One participant recalled what his friends told him later:

I think I was close to going to hospital because I wasn't keeping down water or something like that. That's what somebody said. [Laughs] (Male)

Discussion

Purchasing of alcohol to attend SLFs was an important part of the preparation ritual to the young people in this study. This finding is not surprising as according to Rasool and Winnington17, adolescents see alcohol consumption as a recreational activity; and this notion was apparent in this study. For school leavers, alcohol was part of ‘letting loose’ at Schoolies and integral to celebration. It also must be noted that within Australia alcohol is considered the most popular intoxicant whilst attending Schoolies6,18-22. In addition to alcohol being consumed, it occurred within a group of peers. When asked, none of the participants in this study mentioned that they drank alcohol alone. This finding is supported by Gardner and Stienberg22, who state that one would expect that the majority of school leavers would be heavily influenced by those with whom they attend Schoolies.

Previous studies have shown that school leavers do plan to drink alcohol at Schoolies4,22. However, what this study highlights is the great length that participants went to when planning and budgeting for their purchase of alcohol. This planning was undertaken to ensure that their SLF event was a success. Participants discussed setting aside time to plan what types of alcohol they would purchase and when they would drink it. To this end, the most expensive drink was planned to be drunk first, with the cheaper alcohol kept for when they were intoxicated. Vodka was nominated as the drink of choice as it could be mixed with a variety of ingredients.

Peer influence is a big part of alcohol and drug consumption during adolescence23,24 and is an important aspect in the risk-taking behaviour of young people21. For participants in this study peers were people they could trust, including those that would look after them while you were under the influence of alcohol. As well as valuing peers, on-site volunteers, mainly made up of other young people, were also valued by the Schoolies.

These volunteers were considered an important part of the SLF, because they were there to keep them safe, provide moral support, and to help them out when they got into difficulty. Peer-led support is an important consideration in the safety of school leavers at this type of event. Hutton, Cusack and Zannettino4 discuss building safe supportive environments for young people at SLFs and mechanisms such as on-site support, for example these volunteers, was one such strategy.

This study found that adolescents preloaded before entering the dry zone. Preloading is not a new phenomenon; studies on American football games cite ‘tail gating’25, prior to entering dry college games. Murugiah26 when discussing binge drinking at Australian universities found that preloading was a common occurrence prior to going out for many adolescents. These findings suggest that previous patterns of drinking must be taken into consideration when considering harm prevention at SLFs. Grekin, Sher and Krull17 found that previous patterns of drinking influenced how young people drank at celebrations and it appears that the SLF is no exception.
Lastly, participants self-reported the negative consequences of too much alcohol consumption; therefore, for some of the participants in this study, going to hospital was part of their SLF experience. Hutton et al.'s study found that 50% of young people that presented to on-site care had drunk more than five standard drinks. In addition, the majority of these presentations were between the hours of 9 pm and 12 midnight, indicating that some of these school leavers may have preloaded prior to attending the event.

The seeking of health information around the use and purchasing of alcohol was not undertaken by any of the participants. In fact, most of the school leavers were more focused on what to drink and who to drink it with.

Limitations

This study is not without its limitations. The young people in this study are not representative of the entire school leavers' population. Only 38 people were recruited for this study; however, it must be noted that data collection was stopped after seven focus groups as no new data around how Schoolies accessed health information was apparent. Further studies can address these limitations and could use other qualitative tools, such as semi-structured interviews or ethnography to observe drinking behaviours. Future research is needed on the link of the dry zone to preloading and the prevailing Australian culture of drinking alcohol and celebration and its impact on young people who are attempting to navigate this space.

Conclusion

Given the increase in drinking levels and the accessibility that young people have to alcohol, it is vitally important that this population is supported effectively while celebrating at SLFs. Methods of harm reduction acknowledging that school leavers attend these festivals with the intent to celebrate with alcohol, calls for the development of strategies that can lead to a safer and more supportive environment in which alcohol-related harm for young people is minimised.

The knowledge gained from this study does give an insight into adolescent drinking behaviour from their perspective, demonstrating that adolescents do not plan to be free from alcohol-related harm when attending SLFs; in fact they plan to engage in it. Methods of harm reduction acknowledging that school leavers attending these festivals with the intent to celebrate with alcohol, calls for the development of strategies that can lead to a safer and more supportive environment in which alcohol-related harm for young people is minimised. Strategies such as peer-led volunteers is one such mechanism, but more work is to be done with adolescents to mirror their expectations of having a good time with the negative consequences of alcohol use.

References

Scoping review of the literature about family-centred care with caregivers of children with cystic fibrosis

Linda Shields *
Professor of Nursing — Tropical Health, Tropical Health Research Unit, James Cook University and Townsville Hospital and Health Service; and School of Medicine, University of Queensland
Email linda.shields@jcu.edu.au

Ailsa Munns
Lecturer, School of Nursing and Midwifery, Curtin University, Perth, Western Australia

Marjory Taylor
Head of Department, Library & Information Service, Child and Adolescent Health Service, Perth, Western Australia, Australia

Lynn Priddis
Senior Lecturer, School of Psychology and Speech Pathology, Curtin University, Perth, Western Australia, Australia

Judy Park
Biostatistician, Telethon Institute of Child Health Research, Centre for Child Health Research, University of Western Australia, Perth, Western Australia, Australia

Tonia Douglas
Clinical Director of Cystic Fibrosis Services, Princess Margaret Hospital for Children; Associate Professor, School of Psychology and Medical Education, Curtin University; Senior Clinical lecturer, School of Paediatrics and Child Health, University of Western Australia, on behalf of AREST CF, Perth, Western Australia, Australia

* Corresponding author

Abstract
Background Cystic fibrosis is a severe, life-shortening, inherited condition which imposes an enormous burden on the family and patient, and family-centred care (FCC) is postulated as the optimal model of care for these children and families.

Aims To search for literature investigating the use of FCC as a model of care in cystic fibrosis units for children under 13 years.

Methods A comprehensive search of the following databases was conducted: Cochrane Library, CINAHL, Embase, Medline, PsycINFO. Using the PRISMA flow chart and processes of the United Kingdom Centre for Reviews and Dissemination, we selected relevant studies. The detailed search strategies are available from the authors. We set clearly defined inclusion and exclusion criteria, and had we found any studies, we would have analysed them; however, none were found that specifically examined the topic. We decided to use this as a scoping study.

Findings One hundred and twenty-one studies were identified that met the inclusion criteria for types of studies about cystic fibrosis, but none were about FCC.

Discussion This brief report illustrates the need for research into the application of FCC as a way of caring for children and families where one or more of the children have cystic fibrosis.

Implications for practice Families of children with cystic fibrosis need supportive care in health services.

Conclusions Further research is required to explore whether or not cystic fibrosis care is family-centred, and models of care that meet the needs of all family members need to be developed, tested and used.

Keywords: Cystic fibrosis, family-centred care, evidence-based practice, respiratory, family, children.
What is known about this topic
- Cystic fibrosis is a life shortening inherited disease that imposes a large burden on families.
- Family-centred care is an ideal in the care of children using health services

What this paper adds
- Evidence about the use of family-centred care in the delivery of health care to children with cystic fibrosis.

Declarations

Competing interests: nil known.

Ethical approval: not required.

Guarantor: LS.

Contributorship: TD, LP and LS conceptualised paper, wrote background. MT and LS undertook searches, AM and LS screened studies, JP and AM data extraction. AM and JP quality assessment, AM, JP and LS data synthesis, crafted findings. All authors constructed, wrote and edited the paper.

Acknowledgements: This study is supported by the National Health and Medical Research Council (513730). The AREST CF would like to thank the contributions of Princess Margaret Hospital for Children, The Telethon Institute for Child Health Research, Royal Children’s Hospital Melbourne and Murdoch Children’s Research Institute and the support of the Cystic Fibrosis Foundation, Australia. We thank Dr Nina Power and Professor Linda Franck for permission to use their quality assessment tool, and Ms Kay Newman for help with editing.

Background

Overview of cystic fibrosis

Cystic fibrosis is a severe, life-shortening, inherited condition which imposes an enormous burden on the family and patient because of intensive daily treatment, physical restrictions incurred through ill health, and the psychosocial morbidity associated with intractable health decline and early mortality. It is the most common autosomal recessively inherited disease of Caucasians, with an incidence of 1:3,000 live born children and affecting over 2,800 Australians. Cystic fibrosis is a severe, lethal, multi-systemic disease with progressive pulmonary infection and inflammation responsible for 90% of the morbidity and mortality. Life expectancy for patients with cystic fibrosis in Australia has increased only marginally over the past 15 years and considerable heterogeneity in disease manifestation and severity persists despite the introduction of newborn screening for cystic fibrosis and advances in medical care.

There has been significant progress in our understanding of the early mechanisms of lung disease in cystic fibrosis and the complex interactions between individual cellular, inflammatory and immune responses to environmental and genetic influences. However, while there here has been long-standing recognition that extrinsic factors within the individual child’s psychosocial environment act as moderators of disease progression and severity, this complex area of cystic fibrosis remains poorly understood and little researched. Many health professionals working with children and families with cystic fibrosis have reported significant improvements in individual health outcomes for the child occur following positive changes to the family or social environment of the child and it is becoming recognised that the way the whole family is cared for may have an influence on outcomes for the child with cystic fibrosis.

An overview of family-centred care (FCC)

Family-centred care (FCC) is defined as “a way of caring for children and their families within health services which ensures that care is planned around the whole family, not just the individual child/person, and in which all the family members are recognised as care recipients” (p. 1318). While no rigorous evidence exists to demonstrate its effectiveness as a model of care delivery, it seems likely that, especially for very young children, FCC is an ideal model in keeping with developmental evidence that children do best in supportive familial environments and it recognises the importance of the family as a constant in the child’s life. In a chronic paediatric condition such as cystic fibrosis, there can be little doubt that the parent/primary caregiver (however described by each individual family) is, from a legal, ethical and emotional perspective, the cornerstone of effective implementation of any treatment, and the main anchor for the afflicted child. No model of care will be effective unless the parent/family/extended family is considered, but this comes at a cost to all those family members. It is imperative that health professionals delivering care to a child with cystic fibrosis consider such costs to all the family members.

Significance and purpose

Despite the ubiquitous referral to FCC in policy documents, protocols, guidelines in health services across the world, there is little evidence of its effectiveness and excellent qualitative research is emerging that describes problems with its implementation. However, its tenet of centrality of the family in a child’s care planning makes it the ideal model, especially for a condition such as cystic fibrosis. Anecdotally, there is much substantiation that FCC is well applied and effective in cystic fibrosis care, and so this review aims to identify, summarise and critique research on the use of FCC as a model of care with children and families with cystic fibrosis, and compare and contrast the findings where possible.

Procedure

Design: We followed recommendations of the United Kingdom Centre for Reviews and Dissemination for search
methods, quality assessment data extraction and analysis\textsuperscript{24}, and used a modified version of the PRISMA\textsuperscript{25} flow chart to demonstrate results of the searches.

**Search methods:** We searched the following electronic databases from the indicated year until December 2010: Cochrane Library, 1996; CINAHL, 1982; Embase, 1980; Medline, 1948; and PsycINFO, 2002. This search is the same as that used in a recently published update of a Cochrane systematic review of FCC for hospitalised children aged 0–12 years\textsuperscript{26}, with “cystic fibrosis” and related terms added. A full copy of the search strategy is available from the authors. A manual search of papers’ reference lists was conducted to locate additional relevant papers. Because of constraints on our ability to have translations done we included only those articles written in English (although we assessed English abstracts of papers in other languages if available). Authors were contacted for clarification as required and if possible. Grey literature on the topic was sought but was not readily available. However, we sought abstracts of research reports, if they were the only source available (for example for studies in languages other than English). If possible, we contacted authors for full papers or data.

**Search terms were:** cystic fibrosis, hospitalisation, family-centred care, patient-centred care, parents, caregivers, family, partnership in care, infant, child, adolescent, paediatrics. The searches were conducted using MeSH terms, the thesauruses of other databases, and key word searching. The searches used in this current review are based on the update of a Cochrane systematic review of FCC for hospitalised children under 13 years of age\textsuperscript{27} and used the same search terms, but added “cystic fibrosis”.

**Types of studies:** We included descriptive, qualitative and quantitative studies, randomised controlled trials (RCTs), quasi-experimental trials, pre- and post-intervention studies, and case control studies.

We excluded single case studies, review articles, policy documents and papers, book chapters, commentary papers, essays, practice reports and non-published theses.

**Participants and settings:** we included studies about parents (or primary caregivers) of children aged up to 12 years\textsuperscript{27} with cystic fibrosis. We included all categorisations of “parents” — mothers, fathers, “caregivers”, family members. We excluded studies about children only because we wanted to focus on the parents/caregivers as the centre of care for young children. We also excluded studies about adolescents, because the way FCC works changes when the child becomes independent of his or her parents, and it becomes more “person-centred”.

**Quality assessment:** With the authors’ permission we planned to use a tool designed for a review of parent participation\textsuperscript{24}, assessing all included studies. Key components of the tool (which was based on guidelines of the Centre for Reviews and Dissemination\textsuperscript{27}) related to sampling, design, intervention and outcome measurement. We cross-checked the quality assessment with Greenhalgh\textsuperscript{28} to validate our method.

**Data collection and synthesis:** TD, LP and LS wrote the background and conceptualised the review. MT and LS undertook the searches, while AM and LS screened the studies and JP and AM would have extracted the data (had any studies been included). AM and JP undertook quality assessment independently, while AM, JP and LS planned to synthesise the data, and they crafted the findings. All authors constructed, wrote and edited the paper.

Data collected from the reviewed studies included design, number and types of participants, aims of the studies, procedures and methods used, outcome measures and main findings.

**Results**

**Search outcomes:** Figure 1, a modified PRISMA flow chart\textsuperscript{25}, demonstrates the numbers of studies and results of the selection and screening process. From the related searches, we found 121 potential studies through database searches and none that we had not already found through the limited grey literature available to us, or reference lists. We had no duplicates, so 121 remained. Of these, all titles and abstracts were reviewed, but 35 were not research and were excluded. Full text sources of the remaining 86 were examined to check inclusion and exclusion criteria, and 12 remained. We contacted the author about one\textsuperscript{29} to try to access further data, but they were unavailable, and we attempted to find Vardar-Yagl\textsuperscript{et al.}\textsuperscript{30} for clarification of some points which may have allowed us some quantitative analysis, but were unable to find them. One paper\textsuperscript{31} was a validation of a tool which was subsequently used for the study\textsuperscript{22}. These two studies

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{flowchart.png}
\caption{Flow diagram of results of selection process Modified from PRISMA Flow Diagram 2006\textsuperscript{25}}
\end{figure}
do not give age ranges for the children and we were not able to contact the authors, but it was apparent that they had included adolescents, so we excluded both studies. We excluded the remaining possible eight papers because they did not fully meet the criteria for FCC. There were no papers that directly assessed FCC.

We were not able to find any RCTs or intervention studies of any kind, nor did we find any studies that examined FCC directly; in fact, no studies of models of care in cystic fibrosis care were found. Consequently, we decided to present this study as a brief report of a scoping review.

Discussion

We found no studies that met all defined criteria, and none that investigated FCC in families with a child/ren with cystic fibrosis. This brief report demonstrates the pressing need for research in this area given the extensive application of FCC across cystic fibrosis centres and its perceived efficacy and value by health care professionals. The family system is vulnerable to dysfunction and stress secondary to the exigencies associated with lifelong burden of care and prognostic uncertainty. Responsive support and care planning that considers the entire family may influence parental mental health and coping ability with knock-on effects in adherence to treatment and physical health outcomes.

The child with cystic fibrosis is not the only one in the family affected. Siblings are affected by the onerous treatment burden, the uncertainty surrounding the sick child, and by the compromise in parent’s mental health and coping mechanisms.

FCC is a way to care for children in health services in which all family members are the recipients of care with the affected child central to this care provision. While no studies could be included in this review because they did not specifically examine FCC, there is a broad range of studies that report the impact of cystic fibrosis on the family and support the perception that a family-centred approach to care is at least desirable and possibly requisite in cystic fibrosis care. The methods of this review were influenced by the small number of potential studies in the area, the difficulty of contacting authors for clarification of uncertain points, and our inability to include studies in languages other than English. Also, we were not able to conduct a thorough search of the grey literature, and this might have yielded studies able to be included.

Recommendations

Health professionals who work with families where a child has cystic fibrosis are familiar with the pressure on parents, caregivers and all family members and the influence the family system has on the physical and socio-developmental outcomes in the affected child. Intuitively, then, it would seem that an effective model of care that is responsive to the needs of the family unit in clinical decision-making and that ultimately benefits the child-patient is an essential requirement in cystic fibrosis care. Family-centred care may be one such model of care in cystic fibrosis but evidence for its efficacy and value are lacking despite widespread incorporation of FCC into hospital and cystic fibrosis centre policy. Research into family-centred models of care in cystic fibrosis is a priority and should start at a fundamental level that examines family experiences and needs surrounding the care of their child with cystic fibrosis and their interactions with the cystic fibrosis multidisciplinary team. A developmental approach to research is warranted, examining each maturational period (infancy, pre-school years, primary school years, adolescence and transition to adulthood) and in the evolution of cystic fibrosis disease progression as potentially distinct periods with distinct needs and approaches to care. These data can potentially be attained on a local or national level and may inform models of FCC specific to cystic fibrosis. Studies that examine the effects of FCC delivery on family members are required as are studies of the efficacy of implemented FCC models. Randomised trials of FCC, whilst the gold standard approach to determine comparative efficacy between models of care, are difficult to conduct on a local or national scale given the numbers required and the need for geographically separate children's hospitals that are run along similar lines to provide the necessary lack of contamination between sites and homogeneity of populations under study respectively.

With development of a therapeutic paradigm of collaborative care between patients and families and health care professionals in cystic fibrosis care policy, research into the effectiveness of the FCC model in cystic fibrosis is needed.

Conclusion

Cystic fibrosis is a life-limiting chronic disease with a demanding treatment regimen that places a heavy burden on families. FCC is a way to care for families within the health service where care is planned around all family members. This review found no studies of FCC in cystic fibrosis treatment for children from birth to 12 years of age. There is pressing need for research into the way care is structured and delivered to these families, and an examination of how family-centred it should be.

Relevance to clinical practice

Families of children with cystic fibrosis need supportive, family-centred care when they bring their child to a health service, and models of care need to be developed, tested and used that meet the needs of all family members.

References


Cochrane review summary

Chest physiotherapy for acute bronchiolitis in paediatric patients between 0 and 24 months old

Cochrane summaries are based on new and updated systematic reviews published in the Cochrane Library. The summary must be read in conjunction with the full review when making decisions. The authors’ conclusions are summarised but have not been re-interpreted.

Clinical context

Acute bronchiolitis is a viral respiratory infection that accounts for a large proportion of emergency department visits during winter and significant morbidity for the children. Standard treatments include oxygen therapy, and maintaining fluid and nutritional intake.

Chest therapy has been used to improve gas exchange, decrease airway resistance, and lessen the work of breathing by decreasing mucus in the tracheobronchial tree. Techniques have included chest percussion, vibration, chest shaking, and other techniques that encourage coughing, such as passive forced exhalation. However, concerns have been raised over the distress chest therapy may cause infants, and risk of injury in vulnerable children.

The review aimed to investigate the efficacy of chest physiotherapy (any type) in infants under two years of age with bronchiolitis. A secondary objective was to examine the efficacy of vibration and percussion, and passive forced exhalation techniques.

Inclusion criteria

Studies: randomised controlled trials.

Participants: infants younger than 24 months of age hospitalised with acute bronchiolitis.

Intervention

Any trials that compared any chest physiotherapy technique (postural drainage, chest percussion, vibration, chest shaking, directed coughing or forced exhalation technique) against standard care, or any other breathing or drainage technique.

Outcomes

Primary outcomes included change in the severity status of bronchiolitis, time to recovery, oxygen saturation levels, and transcutaneous carbon dioxide partial pressure (PCO₂). Secondary outcomes included duration of...
Results
This is an update of the original Cochrane review published in 2005 and updated in 2007. In this 2011 update five new trials have been included. Therefore the review includes a total of nine trials, with 891 participants. Five trials assessed percussion and vibration (246 participants), and four trials assessed passive expiratory techniques (645 participants) that included increased exhalation (high-flow) technique (IET), and prolonged slow expiration (low-flow) technique (PSE).

Risk of bias
The overall risk of bias comparing passive respiratory techniques was low. However, the overall risk of bias for the percussion and vibration techniques was moderate to high, particularly with blinding (performance and detection bias) and attrition bias. As the results of the smaller studies were similar to results from a large study with a low risk of bias, the conclusions were deemed robust.

Effects of intervention
Primary outcomes
Out of the four trials that assessed vibration and percussion, there were no statistically significant differences in the severity of bronchiolitis between groups at day five, although clinical score measurements differed between studies. Only one trial included respiratory parameters but no significant differences were found between groups in oxygen saturation; however, there was a significant improvement in respiratory discomfort measured up to 15 minutes after the therapy, in the intervention group.

There were also no statistically significant differences from results of the four trials assessing passive expiratory technique in terms of severity of bronchiolitis, time to recovery, and time to clinical stability. No significant differences were found between groups in oxygen saturation or respiratory rates.

Secondary outcomes
No significant differences were found between any intervention and control groups for any of the secondary outcomes.

Authors’ conclusions
Implications for practice
Chest physiotherapy using percussion and vibration or passive respiratory techniques is not recommended as standard practice for infants under 24 months of age with acute bronchiolitis. The techniques did not significantly shorten the duration or lessen the severity of the illness and are associated with possible adverse effects (for example, vomiting and respiratory instability).

One small trial, however, showed a benefit with slow expiration technique physiotherapy combined with salbutamol, which provided short-term relief but this difference was not persistent at the two-hour evaluation in children with moderate bronchiolitis without any adverse effects.

Implications for research
Future directions could include the short-term benefit of chest physiotherapy during an acute bronchiolitis episode, with or without bronchodilator therapy, as transient relief has been found with slow expiration technique and salbutamol. Adverse effects also need to be assessed.

Reference

Last assessed as up-to-date: 13 December 2011.

Summary prepared by
Dr Christine Taylor, Senior Lecturer, School of Nursing and Midwifery, University of Western Sydney, NSW.

Dr Trudi Mannix RN RM NICC BN (Ed), MN (Child Health), EdD, Flinders University School of Nursing and Midwifery, Flinders University, Bedford Park, SA.

Email: trudi.mannix@flinders.edu.au

Members of the Cochrane Nursing Care Field (CNCF)

Referencing for Neonatal, Paediatric and Child Health Nursing
Guidelines for Authors appear on our website: <http://www.npchn.com>. One important point to note is that NPCHN uses the Vancouver system.

To see how to do it, open:

Please note that these sites say that either numbers in brackets or superscript can be used. NPCHN USES SUPERSCRIPT ONLY. Papers will not be accepted unless the Vancouver system is used correctly.
Socks for life

For the year 2013, SOCKS FOR LIFE is the slogan for EFCNI: the European Foundation for the Care of Newborn Infants. SOCKS FOR LIFE promotes art activities that will create attention and awareness for preterm babies in Europe and beyond. It will peak on 17 November with World Prematurity Day 2013.

World Prematurity Day is a globally celebrated day to increase awareness of preterm births as well as the deaths and disability due to preterm birth and the simple, proven, cost-effective measures that could prevent them.

Since 2008, European parent groups have celebrated the day. In 2011, it was celebrated for the first time globally. Since then, many groups, societies, organisations, companies and even individuals across the world have joined in the celebrations and awareness-raising activities. It is now celebrated throughout the world, involving more than 60 countries globally, reaching nearly 1.5 billion people.

For information on how you can participate in SOCKS FOR LIFE and to learn more about the work of EFCNI, go to: http://www.socksforlife.org/index.php?id=wpd