

What are the infant feeding practices of mothers attending a rural community health immunisation clinic with infants aged between six and eight months?

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LIST OF ABBREVIATIONS

ABS - Australian Bureau of Statistics

AFNMU -Australian Food and Nutrition Monitoring Unit

APMAIF -Marketing in Australia of Infant Formula

ASCIA -Australian Society of Clinical Immunology and Allergy

ABA -Australian Breastfeeding Association

BFHI- Baby Friendly Health Initiative

C&FHN -Child and Family Health Nurse

CHIME- Community Health Information Management Enterprise

CSA -Child Sexual Assault

EBM -Expressed Breastmilk

ESPGHAN-European Society for Pediatric Gastroenterology, Hepatology and Nutrition

FSANZ -Food Standards Australia and New Zealand

GSAHS- Greater Southern Area Health Service

HCC- Health Care Card

NHMRC -National Health & Medical Research Council

NSW- New South Wales

NSWHEALTH- New South Wales Department of Health

P-Parity

SES -Socioeconomic Status

WHO -World Health Organisation

ABSTRACT

Objective

This study was undertaken to describe the infant feeding practices of mothers attending the Batemans Bay Community Health Centre's weekly immunisation clinic.

Methods

Mothers (54) with infants aged between six and eight months of age attending the local community health centre immunisation clinic for their child's six month immunisation were asked to complete a survey comprised of 28 questions related to their infant's feeding practices.

Results

The participation rate was 89%, the ages of participants ranged from 19 to 43 years. 24 participants were Health Care Card recipients. Forty-seven (87%) mothers initiated breastfeeding; the average duration of exclusive breastfeeding was 15 weeks; seven (13%) infants were exclusively breastfed until 26 weeks of age. Thirty-one (54%) infants were still receiving some breastmilk at 26 weeks of age. The main reason for loss of breastfeeding exclusivity was the introduction of infant formula 33% (18). HCC holders were 22% less likely to have ever breastfed. Mothers who knew the definition of exclusive breastfeeding were 64% more likely to have ever breastfed. Mothers who had higher SES and knowledge about recommended infant feeding practices were more likely to initiate breastfeeding, still be breastfeeding at 26 weeks and not use formula. Forty-one (76%) infants were introduced to complementary solid foods before the recommended 26 weeks. The average age of introduction of complementary solid foods was 22 weeks.

Conclusions

Very few mothers followed the recommended guidelines related to the duration of exclusive breastfeeding and the timing of the introduction of complementary solid food. The main reason for loss of exclusivity of breastfeeding was the introduction of formula feeds, the main reasons for the early introduction of complementary solid food were generally related to maternal interpretation of infant cues and behaviour. Socio-economic status was associated with choice of infant feeding practice.

Implications

The findings from this study will enable the Eurobodalla Child and Family Health Service to have a starting point to review the outcomes of any implemented practice changes resulting from the local implementation of the NSW Health Breastfeeding policy.

BACKGROUND

This study was undertaken to describe infant feeding practices of mothers attending the Batemans Bay Community Health Centre's weekly immunisation clinic. Batemans Bay is situated in the New South Wales (NSW) Local Government Area of Eurobodalla which is included within the lowest New South Wales socioeconomic status (SES) group or fifth quintile (Australian Bureau of Statistics, 2006). Collected data included breastfeeding initiation, duration and exclusivity as well as reasons for stopping breastfeeding, giving expressed breastmilk (EBM) deciding to formula feed, infant formula choice and factors associated the introduction of complementary solid foods and the timing of the introduction of water and fruit juice.

The Eurobodalla Child and Family Health Service is committed to ensuring the local implementation of the NSW Health *Breastfeeding in NSW: Promotion, Protection and Support* policy directive. Implementation of this policy directive will include working with the local maternity services in the progression towards *Baby Friendly Hospital* accreditation and adoption of the *Baby Friendly Seven Point Plan for Community Health Services*. An obstacle in progressing implementation is that currently, at a local level, there is a lack of adequate routine monitoring and documentation of breastfeeding rates and other infant feeding practices. The data collected is limited and does not reflect the World Health Organisation (WHO) standard infant feeding definitions, NSW Health recommended breastfeeding practices or nationally recommended breastfeeding indicators.

The findings from this study will enable the Eurobodalla Child and Family Health Service to have a starting point to review the results of any implemented practice changes. The computer program used for client documentation at a local level is the NSW Health Community Health Information Management Enterprise (CHIME) program which has the potential to collect data on infant feeding practices via its clinical activity reporting system.

LITERATURE SEARCH

The published literature was searched for:

- Systematic reviews and meta-analyses
- Original papers published in journals within the last ten years and relevant citations within their bibliographies, which were also reviewed.

The search included Maternal and Infant, Medline, CINAHL, Pubmed and OvidSP data bases.

Keywords: Breastfeeding, weaning, breastfeeding definitions, infant formula and introduction of solids.

INTRODUCTION

Accurate monitoring of infant feeding practices is essential to ensure health service policy and plans reflect both state and national health priorities in relation to breastfeeding and the introduction of solids. Research based evidence is required to support area and local health priorities in relation to infant feeding practices, child and family clinical practice and to guide child and family clinical service decisions.

At a national level, the Australian Federal Government has shown commitment to the promotion and support of breastfeeding and acknowledged the importance of increasing the breastfeeding rates by the:

- implementation of the World Health Assembly's International Code of Marketing of Breastmilk Substitutes (the WHO Code);
- establishment of the advisory panel on Marketing in Australia of Infant Formula (APMAIF);
- funding of the \$2 million National Breastfeeding Strategy;
- funding of the Australian Food and Nutrition Monitoring Unit (AFNMU);
- undertaking of National Health Surveys that collect infant feeding practice data;
- endorsing of the Baby Friendly Hospital Initiative to provide supportive breastfeeding environments in maternity units through the accreditation process;
- revision of Infant Feeding Guidelines for Health Workers within the National Health and Medical Research Council's (NHMRC) 'Dietary Guidelines for Australians';
- extension of the Baby Friendly Hospital Initiative to the Baby Friendly Health Initiative which encompasses maternity, paediatric and community health service breastfeeding policy development and implementation;

- establishment of the House of Representatives Standing Committee inquiry into the health benefits of breastfeeding;
- funding of the Australian Breastfeeding Association's work and 1800 phone counselling service.
- reviewing of infant food labeling requirements by Food Standards Australia and New Zealand (FSANZ)

(House of Representatives Standing Committee on Breastfeeding, 2007)

At a state level, the NSW Government has acknowledged the importance of improving state-wide breastfeeding rates and infant feeding practices by the:

- funding of breastfeeding promotion projects;
- undertaking, between 1995-2006 by the Centre for Public Health Nutrition of several breastfeeding reports and surveys;
- adoption of the WHO recommended breastfeeding definitions and indicators;
- undertaking of State Child Health Surveys that collect infant feeding practice data;
- establishment of the NSW Health Breastfeeding Project Group in 2005;
- release in 2006, of the state's first comprehensive breastfeeding policy "Breastfeeding in NSW: Promotion, Protection and Support" (NSW Health, 2007).
- implementation of the Families First Initiative's universal home visiting within the first two weeks post delivery, this visit also enables Child and Family Health Nurses the opportunity to identify new mothers who may be having infant feeding difficulties and to follow up on mothers who may be more vulnerable to infant feeding problems.
- inclusion within the NSW Health's Child Personal Health record or Baby "Blue Book" of questions and indicators that reflect the WHO infant feeding practice definitions;
- endorsement of policy directives for Area Health Services to support breastfeeding staff; (NSW Health, 2007)

The NSW Department of Health also funded the development and distribution of a brochure for parents "Starting Family Foods-introducing your baby to solid foods" (2006) that reflects the WHO recommended guidelines on infant feeding practices and the introduction of complementary foods at about six months of age (Clinical Stream of Women's Children's and Family Health and the Nutrition Department Central Coast Health, 2006). However, these recommended guidelines are not reflected on the supermarket shelves in that shop brought starting infant foods are still labeled from 'four-six months of age' and until the NHMRC's has completed the revision of its 'Dietary Guidelines for Children and Adolescents' which includes the 'Infant Feeding Guidelines', the FSANZ

(2007) will not be altering infant food labeling recommendations. The revised edition is expected in September 2010.

Why is the promotion and support of breastfeeding so important? Throughout the world, breastfeeding rates are used as an indicator of infant and maternal well being. This is due to the extensive and convincing evidence of the numerous immediate and long term benefits of breastfeeding for both infants and mothers.

The literature shows that any breastfeeding is beneficial but exclusive breastfeeding until six months, and a long duration of any breastfeeding protects infants against illnesses such as otitis media, non specific gastroenteritis, atopic dermatitis, and respiratory infections (Kramer *et al.*, 2001, Oddy *et al.*, 2004). It also lowers their risk of being overweight, obese or developing diabetes in childhood and adulthood (Kramer *et al.*, 2004, Burke *et al.*, 2005). Breastfed infants also score higher on IQ tests (Oddy *et al.*, 2003, Julvez, *et al.*, 2006) and have better teeth and jaw development (Viggiano *et al.*, 2004). Many of the above conditions have been identified as health priority areas at international, national and state levels, due to the physical, psychological and economic impact on individuals, health systems and communities.

For mothers, breastfeeding aids in uterine involution, delays the return of ovulation and reduces the risk of ovarian and premenopausal breast cancers and osteoporosis (NHMRC, 2003, World Cancer Research Fund, 2007). In addition to physical health benefits, breastfeeding aids in the emotional bonding processes between mother and infant, is cheaper than formula feeding and is environmentally friendly (NSW Health, 2006).

In Australia the majority of women are, aware of many of the benefits of breastfeeding and most (up to 90%) initiate breastfeeding before leaving hospital. However, the duration and exclusivity of breastfeeding fall well below international, national and state recommended benchmarks. (Webb *et al.*, 2001)

International recommendations advise that women exclusively breastfeed their infants until they are six months or 26 weeks old. However, the word 'breastfeeding' can be used to describe a range of practices which leads to confusion in the understanding and comparison of research data on infant feeding behaviours, which in turn leads to difficulty in developing supportive interventions and monitoring health outcomes (Labbok, M. & Krasovec, K., 1990, Aarts *et al.*, 2000, Agostoni *et al.*, 2008).

To address these issues, in 1991 the World Health Organisation (WHO), agreed on a set of definitions and indicators to describe breast feeding and other infant feeding practices which would assist them in their collection of data for the Global Bank on Breastfeeding. In 2001 these definitions and indicators were reviewed and recommended for use in Australia (Webb *et al.*, 2001). They now are included in the current NSW Health policy directive *Breastfeeding in NSW: Promotion, Protection and Support*, (NSW Health, 2006)

The recommended national indicators are

- Percent ever breastfed
- Percent exclusively breastfed to six months (26 weeks)
- Percent fully breastfed to six months among ever breastfed infants
- Median duration of breastfeeding among ever breastfed infants
- Percent regularly receiving solid foods before six months of age
- Percent regularly receiving breastmilk substitutes before six months of age.

(Garden *et al*, 2007)

World Health Organisation Infant Feeding Definitions – Box 1

Exclusive breastfeeding - The infant has received only breastmilk from his/her mother or a wet nurse, or expressed breastmilk and no other liquids or solids with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines.

Predominant breastfeeding - The infants' predominant source of nourishment has been breastmilk, but the infant may also have received water and water based drinks (sweetened and flavoured water, teas, infusions etc); fruit juice; oral re-hydration solution (ORS); drop and syrup forms of vitamins, minerals and medicines; and ritual fluids in limited quantities. All other food based fluids are excluded, in particular non-human milk.

Full breastfeeding- Total number of infants included in the Exclusive and Predominant breastfeeding categories.

Complementary feeding - The child has received both breastmilk and solid or semi-solid food (this may include any food or liquid including non-human milk).

Breastfeeding - The child receives some breastmilk, but can also receive any food or other liquid including non-human milk.

Weaning - The complete cessation of breastfeeding.

Breastmilk substitute - Any milk (other than breastmilk) or food based fluid used in infant feeding, as a replacement for breastmilk, whether or not it is suitable for that purpose (commonly includes infant formula, cow's milk and other milks fed to infants)

Bottle feeding - The child receives expressed breastmilk, infant milk formula or other breastmilk substitute

(World Health Organisation, 2003)

Early nutritional status has been shown to have an effect on child and adult health and development. Obtaining the necessary micronutrients and macronutrients essential for optimal health and development may depend on the method of feeding practice to which the infant is exposed (Wilson, Forsyth & Green, 1998, Agostini *et al.*, 2008). Infant feeding practices include breastfeeding, the use of expressed breastmilk, infant formula feeding, the timing of introduction

and type of complementary solid food and the giving of water, fruit juices and other liquids. The WHO breastfeeding, breastmilk feeding and infant formula feeding definitions have been used in this survey however, the definition of complementary food is in line with the recommendation of the European Society for Pediatric Gastroenterology, Hepatology and Nutrition – ESPGHAN (Agostini *et al.*, 2008) and refers to the introduction of semi-solid and solid foods and the infant may still be receiving breastmilk and/or infant formula.

Why women choose to breastfeed

There are several factors that have been shown to influence a women's initial decision to breastfeed, these include:

- having a partner who is a white collar worker and is also supportive of breastfeeding;
- making the decision to breastfeed pre pregnancy;
- being a first time mother;
- having been breastfed oneself and therefore having a breastfeeding supportive maternal grandmother (NHMRC, 2003)

Other positive influences include:

- a commitment to breastfeeding;
- previous successful breastfeeding history;
- older maternal age;
- higher maternal education;
- being a non smoker;
- higher socioeconomic status;
- home ownership;

(Shepherd, Power & Carter, 2000, Lanting, Van Wouwe, & Reijneveld, 2005, Forster, McLachlan & Lumley, 2006).

When women are asked why they choose to breastfeed infant health related benefits are cited before maternal focused issues such as convenience, cost and personal enjoyment. (Brodribb *et al.*, 2007). There are very few contraindications to breastfeeding or breastmilk feeding. However, for some women even after making a decision to breastfeed they encounter obstacles that prevent them from achieving their goal. Once a woman has decided to breastfeed, factors arising in the intra-partum and postpartum periods that may hinder her ability and confidence to do so include:

- the type of delivery and length of labour;
- obstetric complications;

- flat or inverted nipples;
- gestation of the infant;
- infrequent breast stimulation;
- the use of non-breastmilk fluids;
- maternity obesity;

(Dewey *et al.*, 2003, Hurst, 2007, Jevitt, 2007).

As well as maternal medical conditions such as:

- diabetes;
- thyroid disease;
- polycystic ovarian syndrome

(Marasco, 2006, Eglash, Montgomery & Wood, 2008)

In many women these factors may cause a delay in the initiation of lactation and increase attachment difficulties. However, this is not always the case, an internet survey of 52 women (Tatano Beck & Watson, 2008), found that for some women a traumatic birth experience actually made them more determined to succeed at breastfeeding.

Previous life experiences can also affect how a woman views herself as a mother and may influence her infant feeding decisions. Women whose experiences have been negative are at high risk of developing postnatal depression and women vulnerable to postnatal depression, are more likely to stop breastfeeding when faced with breastfeeding problems (Henderson *et al.* 2003) and mothers facing breastfeeding difficulties often blame themselves and can feel guilty for a long time after making the decision to wean (Hegney, Fallon & O'Brien (2008).

Breastfeeding may also be used by child sexual abuse (CSA) survivors as a means of healing and validation of their worth as a mother. In a large study undertaken by Prentice *et al.*, (2002) mothers who self reported child sexual abuse initiated breastfeeding at twice the rate of non reporting mothers. However, as breastfeeding may evoke abuse memories, a history of CSA may negatively influence breastfeeding duration (Tatano Beck, 2009).

In New South Wales, initiation of breastfeeding is high with more than 80% of new mothers' breastfeeding on discharge from hospital (Garden *et al.*, 2007). In Australia and in many other developed countries the exclusivity and duration of breastfeeding decreases each postpartum

month, reflected in rates of less than 20% of mothers breastfeeding for six months or longer (NHMRC, 2003).

Although more mothers living in rural areas initiate breastfeeding, they do not breastfeed for as long as mothers living in urban areas (Garden *et al*, 2007). Once a mother has decided to breastfeed, the lack of specialised breastfeeding supportive services in rural areas, such as: dedicated lactation consultant positions, local Australian Breastfeeding Association peer counsellors, mother and baby day stay facilities, and timely access to child and family health nurses, can often cause mothers to prematurely wean or use infant formula when they encounter breastfeeding problems or have issues with unsettled babies. (Stamp & Casanova, 2006, House of Representatives Standing Committee on Health and Aging, 2007).

Lack of community facilities such as separate infant feeding and nappy changing rooms, and eating and shopping establishments in which breastfeeding can be comfortably undertaken are also lacking in rural areas (Stamp & Casanova, 2005). Breastfed infants feed more frequently than formula fed infants and breastfeeding mothers need to be able to feed their infants wherever and whenever they are hungry. However, an issue that can affect the duration of breastfeeding for both rural and urban women is the inability to feel socially comfortable when breastfeeding in public (Scott & Mostyn, 2003).

Locally, this problem was highlighted when all neighbouring coffee shops and eateries were targeted during “Breastfeeding Week 2007” and given Australian Breastfeeding Association (ABA) “Breastfeeding Welcome Here” stickers to display, although the majority of business accepted the stickers, on later review only a small number had them displayed. A brochure produced by the local child and family health nurses and health development staff listing the local ‘breastfeeding friendly cafe’s and restaurants’ is given to every mother on discharge from Moruya District Hospital (Eurobodalla Community Health Service, 2008). There is also only one ‘mother and babies’ room in the local shopping area. Although separate and adequate for the purpose, it is situated within the public toilet complex which may be a deterrent for some mothers.

Why women express breastmilk or breastmilk feed

Reasons why women choose to express or need to give their infants expressed breastmilk include:

- infant illness, prematurity or very low birth weight;
- to increase milk production or stockpile breastmilk;
- as a supplementary feed following a breastfeed;

- the return to work or other periods of extended separation;
 - to get extra rest or to have a break from breastfeeding her infant;
 - maternal illness;
 - attachment difficulties;
 - mastitis;
 - maternal comfort;
 - not wanting to breastfeed but knowing breastmilk is the best nutrition for their infant;
 - to increase partner involvement in infant care;
- (Binns *et al*, 2006, Victorian Department of Health, 2008).

Women can choose to hand express or use a hand or electric breast pump. Over the years, improvements in breast pumps have made them smaller, easier to clean and sterilize and the wider range has made them more affordable. Pumps may be borrowed, hired or bought. The website of the sales division of the ABA have twelve different types of breast pumps for sale ranging from a basic manual model at \$59.95 to an electric model priced at \$748.00 (www.mothersdirect.com.au).

Breastmilk feeding gives mothers the option to maintain the exclusivity and duration of breastfeeding whilst also dealing with breastfeeding problems and competing maternal interests such as employment, education or social activities (Binns *et al.*, 2006). Mothers who express breastmilk are more likely to continue with any breastfeeding until six months (Win *et al.*, 2006), however, return to paid employment within the first six months after giving birth has been associated with early cessation of breastfeeding and the earlier the return to employment postpartum, the shorter the duration of breastfeeding. This finding was regardless of whether the employment was full-time, part-time or casual (Cooklin, Donath & Amir, 2008).

Lack of private areas, in the workplace is an obstacle to expressing breastmilk or breastfeeding during working hours. Breast friendly workplace initiatives such as paid maternity leave, paid lactation breaks for expressing or breast feeding, onsite child care facilities and flexible working hours are more likely to be offered to mothers working for government departments or large corporations. However, any employers who are supportive of breastfeeding are rewarded with the retention of skilled staff and employees who need less time off to care for sick children (ABA, 2008).

Why women choose to use breastmilk substitutes or infant formula feed

Eighty- seven percent of NSW infants had been put to the breast in 2003-2004 (Garden *et al*, 2007); which means that less than 13 % of women decide to formula feed their infants from birth. There are differences in the demographics and personal characteristics between women who choose to formula feed from birth and those who change from breast feeding to formula feeding and those mothers who continue to breastfeed and use some infant formula as well (Forster, McLachlan & Lumley, 2006, Binns *et al.*, 2006, Amir & Donath, 2002).

Maternal demographic factors that are associated with infant formula feeding from birth include, age less than 25 years and lower socioeconomic status. Maternal characteristics include not having been breastfed oneself, being single, lacking supportive networks, smoking and maternal obesity (Amir & Donath, 2002, Amir & Donath, 2007, Lanting, Van Wouwe & Reijneveld, 2005). A lack of maternal and partner knowledge to the benefits of breastfeeding, the misconception that infant formula compares nutritionally to breastmilk and the normalisation of infant formula feeding in the mass media have also been shown to influence the initial choice of formula feeding (Shepherd, Power & Carter, 2000, American Academy of Pediatrics, (AAP) 2005).

In a review of the literature on breastfeeding initiation and duration from 1990-2000, Dennis (2002) found that the main reason given by mothers for early weaning from breast to infant formula feeding was maternal perceived difficulty with breastfeeding rather than maternal choice. The main breastfeeding difficulty cited by mothers is inadequate milk supply, which is also the main reason for the introduction of supplementary formula feeds and the subsequent loss of exclusivity in breastfeeding (Cooke, Sheenan & Schmeid, 2003, Lanting, Van Wouwe & Reijneveld, 2005, Gatti, 2008). Mothers can often feel that their milk supply has decreased if they are unable to differentiate between unsettled behaviour and an increase in their infant's breastfeeding requirements during periods of growth, (Gatti, 2008). This practice has implications given that the duration of any breastfeeding is decreased the earlier a breastfeeding mother introduces regular infant formula feeds (Hörnell, Hofvander & Kylberg, 2001).

Women often face internal and external barriers that influence their choice to feed their child with infant formula. It is interesting to note that in both developing and developed countries similar dominant themes emerged from the literature. Women choosing to formula feed give reasons related to:

- breast and nipple problems;
- inadequate milk supply;

- lack of confidence;
- loss of independence;
- maternal comfort and convenience;
- the need to know how much milk the baby is getting;
- maternal ill health;
- the need to return to work;
- lack of support from significant others;
- embarrassment and lack of confidence resulting in a reluctance to feed in public;
- the wish to involve their partners;
- unwanted body changes

Infant focused issues include:

- poor health of infant;
- poor weight gain;
- unsettled behaviour.

(Stewart-Knox, Gardiner, Wright, 2003, Cooke, Sheenan & Schmeid, 2003, Gill, Reifsnider, Lucke, 2007, McCann, Bayder & Williams, 2007, Otoo, Lartey & Perez-Escamilla, 2008).

The timing of the infant feeding decision is also important as infant feeding decisions made pre-pregnancy or in the antenatal period are strong indicators of postnatal practices (Donath & Amir, 2003). Shepherd, Power & Carter's study (2000) found 50% of breastfeeding mothers made their decision pre pregnancy, compared to only 35% of formula feeding mothers. This finding has implications for child and family health nurses as their first contact with mothers is usually within the first two weeks postpartum.

The reasons why mothers chose one infant formula over another are also important for health professionals to know. There seems to be a lack of literature on whether, mothers actively compare different brands by looking at ingredients and cost or if they are influenced by previous experience, formula company advertising or advice from health professionals, family or friends.

There is also very little independent research and limited evidence on the benefits of different infant formulas for the prevention of allergic disease, food hypersensitivity, improved neurodevelopment and visual acuity (Osborne & Sinn, 2006, 2007, Simmer, Patole & Rao, 2008). However, mothers who are confronted with an array of different brands may feel guilty if they are unable to afford formulas

that are advertised as having extra ingredients important for improved brain growth and visual and cognitive development.

Some mothers also are inclined to change infant formulas as a reaction to their infant's behaviour, such as fussiness or regurgitation and a study by Nevo *et al*, (2007), found that women usually do not seek professional advice before changing formulas. Infant constipation is a common reason for formula change and can be caused by the amount of casein and palm olein oil in the formula (Lloyd *et al*, 1999). However, it is unlikely that mothers are aware of this and change formulas accordingly. The emergence of 'follow-on' infant formulas for infants aged over six months is also confusing for mothers as regular iron fortified formulas meet the infant's nutritional requirements until 12 months of age (American Academy of Pediatrics, 2005).

Introduction of complementary solid foods

It can be difficult for parents to know when to start their infant on solids as the 'starting age' has changed several times since they themselves were infants. They may have been fed solids anywhere from six weeks to six months of age (Formon, 2001, Barker, 2005). Currently the WHO recommends that healthy infants born at term with normal birth weights and drinking breastmilk or infant formula will have all their nutritional needs met until complementary foods are introduced at six months of age. Delaying the introduction of complementary foods or solids until six months not only helps to influence the duration of exclusive breastfeeding but the timing of the introduction of complementary foods has been shown to have important health outcomes for infants. Although the six month timeframe created some controversy, (Lanigan *et al*, 2001), there is convincing evidence that early introduction of solids (under four months) is related to nutritional deficiencies and rapid weight gain in infancy which in turn has implications for childhood obesity (Crocetti, Dundas & Krugman, 2004, Sloan *et al*, 2007).

Although, some researchers would prefer a more flexible timeframe, the WHO recommendation has been endorsed by health authorities in Australia. However, less than half of NSW parents comply with the recommended timeframe (Garden *at al*, 2007). Parental inability to read their infant's cues in relation to sleep needs and temperament may also lead them to believe their infant is displaying hunger signs which can lead to extra milk feeds and the early introduction of complementary solid foods (Crocetti, Dundas & Krugman, 2004). The physiological cues that reflect an infant's readiness for solids are displaying a keen interest in food and what others are eating, reaching for food off others plates, imitating eating behaviours, such as opening their mouth and moving their lips and jaw, the loss of the tongue- extrusion reflex, willingly opening their mouths when food is offered or

the spoon touches their lips, the ability to swallow not just suck, good control of the head and neck and being able to sit with support (FSANZ, 2004, Monti, 2005, QLD Health, 2005).

Early introduction of complementary solid foods is more common with younger mothers, lower socioeconomic status, rapid infant weight gain up to six weeks of age, and infant formula feeding (Fewtrell, Lucas & Morgan, 2003, Wright, Parkinson & Drewett, 2004, Garden *et al*, 2007, Amir & Donath, 2008).

Reasons for the early introduction of complementary solid food include:

- maternal perception of infant readiness and developmental maturity;
- concern about the physical health of the infant;
- advice and encouragement from family and friends;
- commercial infant foods that advertise suitable from four months of age;
- the belief that solids given in the evening will decrease hunger and encourage longer sleeping periods overnight (Anderson *et al*, 2001, Crocetti, Dundas & Krugman, 2004, Monti, 2005, Barker, 2005).

Mothers have a pivotal role in the development of their infant's future food preferences and lifelong eating habits but studies have found that cultural, ethnic and family beliefs related to the introduction of solids have more influence on mothers than concerns about health risks that the early introduction of solids may cause (Crocetti, Dundas & Krugman, 2004). The timing of introduction, quality and texture of introductory solid foods are also important, not only to maintain adequate nutrition and growth but the oral motor skills necessary for solid feeding behaviour such as sucking, biting and chewing aid in the mouth and tongue coordination necessary for speech (MacDonald, 2003).

While the early introduction of solid foods may lead to infant problems, delaying their introduction too far beyond six months can also have some negative effects on growth, allergy risk, nutrient levels and the consistency of foods accepted (Northstone, Emmet & Nethersole, 2001, Krebs, 2007, ASCIA, 2009).

Reasons for giving water and fruit juice

In developing countries, with unsafe water supplies, mothers are aware of the adverse effects of giving water to their infants (Otoo, Lartey & Perez-Escamilla, 2008). Breastmilk and infant formula consist of almost 90% water and even in countries where the water supply is clean and safe to drink

this more than adequately meets infants' daily fluid requirements. Even in hot, dry or humid climates, supplementary water is unnecessary during the first six months of life and may be a means of introducing contaminants or allergens to an infant. (American Academy of Pediatrics, 2001).

Maternal reasons for giving water include:

- concern during hot weather about dehydration;
- inability to differentiate between unsettled behaviour and the increase in frequency of breastfeeding during periods of growth;
- advice from health professionals, family and friends;
- as a treatment option for infant hiccups and constipation;

(Williams, 2006).

There is no nutritional reason for the giving of diluted fruit juice before six months of age. This practice may be related back to the 1920's when the giving of diluted fruit and vegetable juice was used for the prevention of infantile scurvy (Formon, 2001). Fruit juice also offers no nutritional benefits over whole fruit for infants over six months of age and the consumption of fruit juice can cause diarrhoea, reduced intake of essential nutrients, excessive consumption of calories and dental caries (American Academy of Pediatrics, 2001, Formon, 2001). As breastmilk and infant formula both contain vitamins and minerals and Australian infants get adequate exposure to ultraviolet light, there are no requirements for their routine supplementation.

METHODOLOGY

Research design

A cross-sectional survey study was undertaken using a modified questionnaire based on the NSW Health Survey Program 2003-2004 recommended questions related to infant feeding practices. Collection of completed survey forms, were via a sealed box on the community health centre reception counter which was emptied at the end of each immunisation clinic to ensure information was anonymous. A self completed survey was chosen as the research instrument as it was thought to be the most practical method to collect the required data in the time available before the immunisation clinic. Collation and analysis of the data was undertaken via the Microsoft Excel program. Themes related to reasons for weaning and the decision not to breastfeed were also summarised. The survey timeframe was 26 weeks from the 7th January 2009 - 3rd July 2009.

Participants

Locally mothers have a choice to have their infants' immunisation undertaken at their General Practitioners surgery or at a community health centre. The study group was mothers with infants aged between six to eight months of age attending the Batemans Bay Community Health Centre's weekly immunisation clinic for their infant's six month routine immunisation. Inclusion in the survey was voluntary. Immunisation clinic clients were chosen instead of child and family clinic clients due to the age range of the infants. In the child and family health clinics infants attending for a six month health screen can be anywhere from five to nine months of age, but the six month immunisation is only able to be given to infants who are six months of age or older. Also in the Eurobodalla Community Health Service child and family health nurses are not involved in the immunisation clinic and it was thought knowing this the immunisation clinic mothers would feel less obliged to accept if they did not wish to participate.

Exclusion criteria included infants attending for their six month immunisation that were brought into the immunisation clinic by their fathers or other relatives and mothers unable to read English.

Methods of data collection

Mothers were firstly informed about the survey when contacted via a courtesy phone call two days before the immunisation clinic to remind them of their immunisation appointment. They were again asked when completing routine immunisation paperwork if they would like to take part in a research project on local infant feeding practices.

Consenting mothers were then given a questionnaire comprising of 28 questions to complete before their immunisation appointment. The questions consisted of four demographic questions, eleven yes/no questions, four questions that required the infants age in weeks to be calculated and nine questions requiring short response answers. The questionnaire took less than 10 minutes to complete. Collected data included breastfeeding initiation, duration and exclusivity as well as reasons for stopping breastfeeding, giving expressed breastmilk (EBM) deciding to formula feed, infant formula choice and factors associated with the introduction of complementary solid foods and the timing of the introduction of water and fruit juice. Demographic information collected included infant's age, maternal age, parity and socio-economic status using health care card eligibility as an indicator.

Information was also collected on infant gender and month of birth. In this study, exclusive breastfeeding was defined as per the WHO recommended breastfeeding definitions (Box 1) in that

the infant only received breastmilk or expressed breastmilk and no other liquids or solids with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines. Loss of breastfeeding exclusivity may have been due to the infant being given water, infant formula or complementary solid foods. Infant's of mother's, who had infant formula fed from birth, were never put to the breast or received any expressed breastmilk. Regular consumption was defined as, at least once a day as per the NSW Health Population Health Survey 2003-2004. A table was included on the front page of the survey that outlined ages in months and the corresponding age in weeks. Mothers were asked to round down instead of up if a half week was included in their calculations of their infant's age when answering the survey questions.

The nurse immunisers were supportive of the survey and allowed mother's time to read and complete the survey by undertaking routine immunisation paperwork of these client's before their appointment instead of after which was the normal practice.

Ethics

Initial submission to the GSAHS Human Research Ethics Committee was on 11/07/08 and after some revising and expansion of the questionnaire items and changes to the participant information form, the project was approved by the GSAHS ethics committee to proceed on 23/10/08, reference number 08/GSAHS/40. After receiving permission to proceed, the research phase commenced in January 2009 and ceased in July 2009. An amendment was sought and approved on the ways in which mothers were initially informed about the survey, during the courtesy immunisation appointment phone call two days before the clinic instead of at the time of the appointment.

Statistical Methods

Percentages were calculated using the total number of mothers surveyed (54) as the denominator. In addition to summarising the results with counts and percentages, analyses were also conducted to determine if there were any associations between certain factors of interest. The outcomes of interest were breast feeding at birth, breast feeding at 26 weeks and use of formula in the first 26 weeks. The exposures of interest were health care card status as a crude indicator of socio-economic status, and knowledge of the WHO definition of exclusive breast feeding as an indicator of awareness of recommended practices. The association of these two exposures with the outcomes was examined using relative risk with 95% confidence intervals. Mother's age was also potentially associated with breast feeding at birth and breast feeding at 26 weeks. This was assessed by comparing mean and median ages for the breast feeding vs. non-breast feeding groups.

RESULTS

The participation rate was 87%. Fifty-four mothers out of a possible sixty-one mothers with infants aged between six and eight months of age attending the Batemans Bay Community Health Centre completed the survey before their infant's immunisation clinic appointment. Three mothers asked to take their surveys home to complete but did not return them, three infants were brought to the clinic by their father, and one mother was unable to read English. There was one set of twins attending for immunisation during the survey timeframe but only one of the twins' data was included to prevent duplication of information. During the timeframe of the survey, no mothers who identified as Aboriginal or Torres Strait Islander attended the immunisation clinic.

Table 1: Maternal and infant characteristics of participating clients attending the Batemans Bay CHC weekly immunisation clinic 7th Jan 2009- 3rd July 2009.

	N	%		N	%
Mother's Age			Parity		
Under 25	12	22%	P1	21	38%
25 to 29	12	22%	P2	15	28%
30 to 34	14	26%	P3	10	19%
35 and over	16	30%	P4 +	8	15%
Ever breast fed			Attends C&FH Clinics		
Yes	47	87%	Yes	51	94%
No	7	13%	No	3	6%
Still breast feeding at 26 weeks			Health care card Holder		
Yes	31	57%	Yes	24	44%
No	16	30%	No	30	56%
Exclusively breast fed until 26 weeks			Knows WHO definition of EBF		
Yes	7	13%	Yes	42	78%
No	47	87%	No	12	22%
Baby's sex					
Male	21	39%			
Female	33	61%			

Maternal and infant characteristics of participants are summarised in Table 1.

Mothers were more likely to be aged over 25 years (78%), be first-time mothers (38%) and attend child and family clinics (94%). The majority of mothers initiated breastfeeding (87%) and knew the definition of exclusive breastfeeding (78%). Over half were still breastfeeding at the time of completing the survey (57%). Less than half were health care card holders (44%).

INFANT FEEDING PRACTICES

Breastfeeding

Forty-seven (87%) mothers initiated breastfeeding and the average duration of exclusive breastfeeding was 15 weeks. Seven (13%) mothers exclusively breastfed until 26 weeks, none of these mothers were health care card holders. The main reason for loss of breastfeeding exclusively was the introduction of infant formula feeds (46%). Thirty-one (66%) mothers were still giving their infants some breastmilk at the time of completing the survey. Ten of these mothers were HCC holders. Seven breastfeeding mothers also regularly gave their infants expressed breastmilk.

The main reasons for loss of breastfeeding exclusivity are listed in Table 2. Among women who breast fed initially the main reasons for loss of EBF were use of formula and giving solids. Of the mothers who ceased EBF because of giving formula more than half were not breast feeding at 26 weeks. Of all the reasons for cessation of EBF, giving formula occurred earliest on average (11.4 weeks), while solids were given the latest on average (21.3 weeks). The introduction of solids and water as a loss of EBF did not increase weaning rates as all these mothers were still breastfeeding to some extent at 26 weeks. Six of the seven mothers who did not breast feed from birth also had a HCC, while none of the seven mothers who breast feed exclusively to 26 weeks had a HCC.

Table 2: Reasons for loss of breastfeeding exclusivity and related maternal demographics

Reason	Number	Number still breast fed at 26 weeks	Lowest age of introduction	Mean age of introduction	Mother's with a HCC	Mean maternal age
Solids	10	10	13 weeks	21.3 weeks	3 (30%)	32.3
Infant formula	18	7	1 week	11.4 weeks	8 (44%)	28.6
Water	5	5	5 weeks	18 weeks	2 (40%)	34.4
Solids & other	3	2	16 weeks	17.3 weeks	3 (67%)	28.3
Reason not given	4	0	...	...	1 (25%)	29.3
Never breast fed	7	n/a	...	...	6 (86%)	29.9
EBF until 26 weeks	7	7	...	...	0 (0%)	30.7

Table 3: Relative risks and 95% confidence intervals for various exposures and outcomes

Outcomes	Exposures	
	HCC holder	Knows Definition of EBF
Ever Breast fed	0.78 (0.61, 0.99)	1.63 (1.01, 2.65)
BF at 26 wks	0.60 (0.35, 1.01)	2.67 (0.98, 7.27)
Ever given formula	1.18 (0.83, 1.69)	0.67 (0.49, 0.90)

Table 3 summarises the associations between maternal SES and knowledge of the definition of EBF on infant feeding practices. HCC holders were 22% less likely to have breastfed. Mothers who knew the definition of exclusive breastfeeding were 64% more likely to have ever breastfed. Mothers who had higher SES and knowledge about recommended infant feeding practices were more likely to initiate breastfeeding, still be breastfeeding at 26 weeks and not use formula.

Infant formula Feeding

Seven (13%) mothers formula fed from birth and six of these mothers were HCC holders. Reasons given for choosing not to breastfeed were maternal focused and choice of formula was influenced by previous use and advice from family and hospital staff. The introduction of infant formula was the main reason for loss of breastfeeding exclusivity and weaning before 26 weeks. Twelve (22%) mothers weaned within the first eight weeks. The main reasons for weaning were related to milk production and attachment difficulties.

Table 4: Infant Formula Feeding Practices

	Number/54	Percent
Infant formula fed from birth	7	13%
Weaned in first 2 weeks	6	11%
Weaned from 2 to 8 weeks	6	11%
Weaned at time of survey	16	30%
Still breastfed and having infant formula irregularly	4	7%
Still breastfed and having infant formula regularly	10	19%
Breastfed and never received any infant formula	17	31%

Breast and infant formula feeding (mixed feeding)

Ten (19%) mothers regularly gave their infants formula and were still breastfeeding at 26 weeks. None of these mothers were HCC holders. Thirty-one (66%) of initially breastfeeding mothers had given their infant formula at some time before completing the survey. Of the mother's who mixed fed seven were older than 28 years of age and eight had more than one child.

Introduction of complementary solid food

The earliest age of introduction of complementary solid food was 13 weeks; the mean age was 21.3 weeks. Twelve mothers (22%) introduced complementary solid food at the recommended age of 26 weeks. Twenty-six mothers (48%) introduced complementary food at or after the previously recommended timeframe of 4 months or 17-18 weeks. The main reasons given for introducing complementary solid foods are listed in Table 5. The most common reasons were maternal perception of infant interest, the age of the infant and maternal concerns that milk was not satisfying their infant. Table 6 lists changes in infant behaviour noted by mother after the introduction of complementary foods. Twenty mothers (37%) commented that their infant was more content and sleeping better after starting solids and 18 mothers noticed no change in their infant behaviour at all. The ten mothers (19%) who lost EBF status due to the introduction of complementary solid foods were all still breastfeeding at 26 weeks.

Table 5: Maternal reasons for introducing complementary foods

	Number/54	Percent
Showed interest in what we were eating	16	30%
Age of infant	13	24%
Maternal concern milk was not satisfying enough	13	24%
Showed signs of hunger	8	15%
Night waking	4	7%
Unsettled during the day	2	4%
Big baby	2	4%
As a treatment option for reflux	1	2%

Mothers (54) may have given more than one response (16.6%)

Table 6: Changes in infant behaviour noted by mother after complementary foods introduced

	Number/54	Percent
More settled, sleeping better , more content	20	37%
Growth better	11	20%
No change	18	33%
Yes but not described	3	5%
Sleep disrupted	2	4%
Not answered	1	2%

Mothers (54) may have given more than one response (20%)

Introduction of water and fruit juice

Twenty-five (46%) mothers introduced water before 26 weeks. The early introduction of water (< 12 weeks) was more likely with mothers who had infant formula fed from birth or weaned in the first month. Fifteen of the 19 mothers (63%) surveyed in the summer months of January and February were regularly giving their infants water. Only fourteen (26%) of all surveyed mothers gave their infants fruit juice but infant age at introduction was not specified.

Comparison of local, area and state infant feeding practices

Table 7 shows that the local exclusive breastfeeding rate was higher than GSAHS rate as a whole and the proportion of local infants introduced to complementary solid foods before 6 months is much higher than the GSAHS and NSW rate. Just over half of infants in Batemans Bay and GSAHS receive breastmilk substitutes before 6 months.

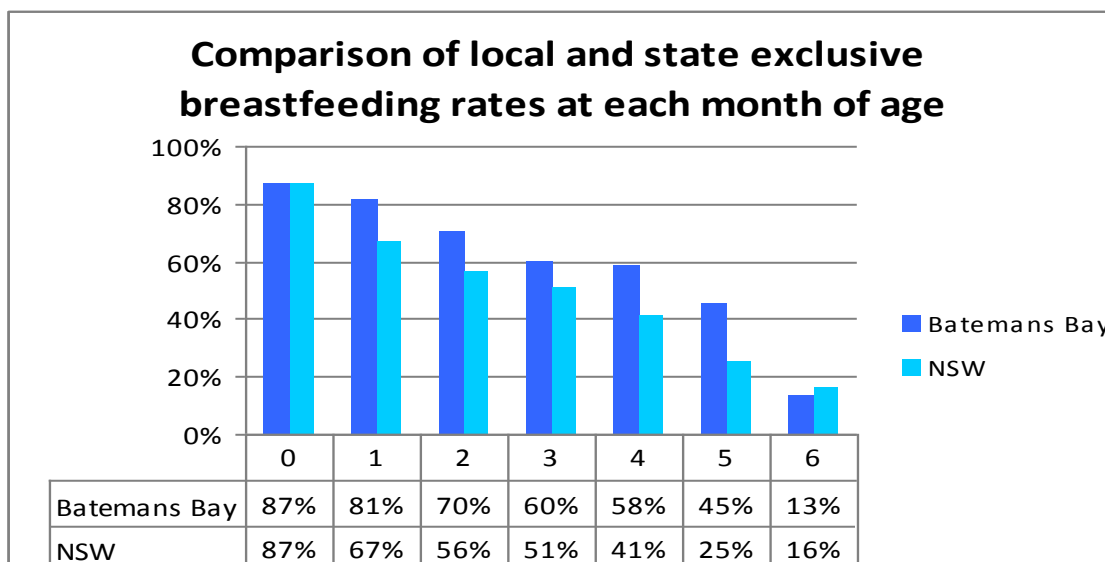
Table 7: NSW recommended infant feeding indicators – comparison of local, area and state %

NSW Infant Feeding Indicators	Batemans Bay	GSAHS	NSW
% Ever breastfed	87%	86%	87%
% Exclusively breastfed to six months (26 weeks)	13%	8%	16%
% Fully breastfed to six months among ever breastfed infants	17%	17%	25%
% Regularly receiving solid foods before six months of age	76%	61%	54%
% Regularly receiving breastmilk substitutes before six months of age	51%	51%	4%

(NSW Health Survey 2003-2004, Garden et al 2007).

Chart 1 shows the proportion of local and state infants exclusively breastfed from 0-6 months of age. The proportion of survey participants exclusively breastfeeding was the same or higher than NSW proportions at all months except 6 months.

Chart 1: Proportion of infants exclusively breastfed from 0-6 months of age



DISCUSSION

The Eurobodalla child and family health service is committed to ensuring the local implementation of the NSW Health *Breastfeeding in NSW: Promotion, Protection and Support* policy directive. An obstacle in progressing implementation was that locally there was a lack of routine monitoring and documentation of breastfeeding and other infant feeding practices.

The aim of this study was to obtain baseline data on the infant feeding practices of mothers attending the Batemans Bay Community Health Centre’s weekly immunisation clinic. Fifty-four mothers of infants aged between six and eight months were surveyed about their infant feeding practices. Collected data included breastfeeding initiation, duration and exclusivity as well as reasons for stopping breastfeeding, giving expressed breastmilk (EBM), deciding to formula feed, infant formula choice and factors associated with the introduction of complementary solid foods and the timing of the introduction of water and fruit juice. Demographic information collected included infant’s age, maternal age, parity and socioeconomic status using health care card eligibility as an indicator.

The study group may not be reflective of the whole population of local mothers with infants aged between six and eight months as we are unaware of the demographics and characteristics of the mothers who see their general practitioner for their infants' immunisation, however, the majority are reflective of the local child and family health clinic clientele as 51 (94%) of mothers from the study stated that they attended local child and family health clinics.

LOCAL INFANT FEEDING PRACTICES

Breastfeeding

Breastfeeding results were similar to previously cited Australian and overseas studies in that older maternal age, higher socioeconomic status and knowledge of the definition of exclusive breastfeeding were positively associated with breastfeeding initiation and duration. Most mothers initiated breastfeeding and were aware of the recommended guidelines related to breastfeeding, but very few breastfeed exclusively until the recommended 26 weeks.

In this study 47 (87%) mothers initiated breastfeeding and although only seven (13%) local infants were exclusively breastfed until 26 weeks of age, 31 (54%) infants were still receiving some breastmilk at 26 weeks of age. Another positive finding from the study was that the local exclusive breastfeeding rates were higher than the NSW rate at all months except 6 months.

Twelve mothers (22%) who initiated breastfeeding weaned within the first two months. The main reason for weaning cited by these mothers, related to breastmilk supply and attachment difficulties. In rural areas the lack of specialised breastfeeding supportive services such as: dedicated lactation consultant positions, local Australian Breastfeeding Association peer counsellors, mother and baby day stay facilities, and timely access to child and family health nurses, can often cause mothers to prematurely wean or use infant formula when they encounter breastfeeding problems or have issues with unsettled babies. (Stamp & Casanova, 2006, House of Representatives Standing Committee on Health and Aging, 2007).

Infant Formula Feeding

Only seven (13%) of mothers exclusively infant formula fed from birth and the reasons given were maternal focused. With such a small number it is difficult to generalise the findings from the maternal demographics, however as six mothers were HCC holders, lower SES was more prevalent in this group of mothers.

The widespread use of infant formula supplementation in breastfeeding infants is a concern to local child and family nurses. Thirty breastfed infants had at some time been given infant formula and ten breastfeeding infants regularly received infant formula. This practice has implications given that the duration of any breastfeeding is decreased the earlier a breastfeeding mother introduces regular infant formula feeds (Hörnell, Hofvander & Kylberg, 2001).

Studies have found that the introduction of infant formula feeds was the main reason for the loss of breastfeeding exclusivity (Cooke, Sheenan & Schmeid, 2003, Lanting, Van Wouwe & Reijneveld, 2005, Gatti, 2008). This was also the main reason in this study. However, of the 18 mothers who lost EBF status by the introduction of infant formula feeds seven were still breastfeeding at 26 weeks.

Introduction of complementary solid foods

In this study, the introduction of complementary solid foods to breastfeeding infants was not reflected in an increase of weaning rates, in that the 13 mothers who lost breastfeeding exclusivity status by the introduction of complementary solid food before 26 weeks were still breastfeeding at the time of the survey.

Currently the WHO recommends that infants be introduced to complementary solid foods at 26 weeks of age. However at the time of endorsement of the new guidelines there was controversy with the validity of the research results on which the WHO based their introduction of complementary foods recommendations (Lanigan *et al*, 2001). Recent studies have emerged that question the benefits of delaying the introduction of complementary foods to reduce the development of allergies. These findings are reflected in the current (2008) *Infant Feeding Advice* fact sheet from the Australasian Society of Clinical Immunology and Allergy (ASCIA), which recommends introducing solids between four to six months of age. This finding is also supported by ESPGHAN who state that solids should not be introduced before 17 weeks and no later than 26 weeks (Agostini *et al*, 2007).

The majority of mothers (91%) in this study adhered to the previous timeframe of after four months or 17-18 weeks. Of the five mothers who introduced complementary solids before four months, three were aged less than 25 years of age. As a group, younger mothers, 13 (87%) were more likely to introduce complementary solids before 26 weeks. A difficulty for mothers is that the WHO's recommended guidelines are not reflected on the supermarket shelves. Shop brought starting infant foods are still labeled from 'four-six months of age' and until the NHMRC's has completed the revision of its 'Dietary Guidelines for Children and Adolescents' which includes the 'Infant Feeding

Guidelines', the FSANZ (2007) will not be altering infant food labeling recommendations. The revised edition is expected in September 2010.

Pending this publication, child and family health nurses may need to concentrate on educating mothers on the on the physiological cues that reflect infant readiness for solids. If mothers are going to be introducing solids earlier than the present recommended time frame child and family health nurses will also need to make sure that the introduced food is nutritious and also does not replace breastmilk feeding or infant formula feeds. To address these issues local mothers could be seen at the child and family clinic when their infants are aged between nine weeks and four months. Currently many mothers are seen after already introducing solids as the developmental screens set out in the infant's Personal Health record or 'Blue Book' are spaced from two months (six to eight weeks) then next at six months.

For many mothers a six months introduction timeframe may be too prescriptive. Child and family health nurses regularly reassure mothers of the individuality of each child and that the progression through developmental achievements is along a continuum. For all other milestones such as sitting, crawling, walking and language acquisition we have early and late starting points. When looking at these milestones we take into account the infant's previous history, family environment and the influence of siblings. Therefore, the individual circumstances of each infant should be taken into account and timeframes may need to be flexible. Some infants may be ready for solids before six months of age and others may not be ready to progress to solid foods until older (Lanigan *et al*, 2001).

Introduction of water and fruit juice

Twenty-five (46%) mothers introduced supplementary water before 26 weeks of age. Introduction of water was more likely with mothers who were infant formula feeding or during summer months. As breastmilk and infant formula is 90% water the giving of supplementary water is unnecessary and in some cases detrimental to the infant. This is an area that may require routine information to be given to all mothers along with strategies to address issues related to hot weather. The giving of fruit juice is another unnecessary practice that needs to be discouraged but as only 14 mothers (26%) did so; it was not a widespread practice.

Our role as child and family health nurses is to support our clients to make informed choices in relation to their choice of infant feeding practice. However, ensuring recommended practice is implemented and followed requires that all health care providers in contact with mothers and

families on their parenting journey are consistent in the advice given so that whatever infant feeding choice is made mothers and families feel supported.

The child and family health service is committed to ensuring the local implementation of the NSW Health *Breastfeeding in NSW: Promotion, Protection and Support* policy directive. Implementation of this policy directive will include working with the local maternity services in the progression towards *Baby Friendly Hospital* accreditation and towards adoption of the *Baby Friendly Seven Point Plan for Community Health Services*. A component of this plan is the education of all levels of staff that have contact with mothers, infants and their families on optimal infant feeding practices. As a group nurse immunisers are in an excellent position to reinforce optimal infant feeding practice as they see mothers at two months and again at four months which is a critical time for weaning and the introduction of solids. Mothers experiencing breastfeeding difficulties at two months can be referred for priority follow up by the child and family service. At the four month immunisation clinic visit, nurse immunisers can reinforce the recommended guidelines for the introduction of solids. All of the community health services use CHIME for clinical notation and collection of data and infant feeding practice data reflective of WHO definitions could be documented at these visits as clinical note activities.

LIMITATIONS OF RESEARCH

It is not expected that the findings of this study would be able to be generalised to other populations due to the small size of the study group. However, the information collected will be extremely useful at a local level in that the local child and family health service now has starting data on which to compare changes to local infant feeding practices resulting from the implementation of the NSW Breastfeeding Policy. Recommended infant feeding definitions and indicators will also be incorporated into routine data collection procedures to enable this to occur.

Due to time limits and the importance of collecting relatively non confronting data the following information which may have influenced maternal choice of feeding practice was not collected. The influence of the following topics would be areas of focus for future research.

- Definition of solid food was not stipulated so semi-solid or soft foods or anything put into bottles may have been missed
- Type of complementary foods was not asked so nutritional quality, amount, texture and consistency was not known
- Previous infant feeding experiences and practices

- Number of daily breastfeeds or duration of breastfeeds – intensity of breastfeeding
- Amount that breastmilk contributed to infants over all diet
- Formula feeding questions did not stipulate volume of formula

CONCLUSIONS

Although the majority of local mothers were aware of the definition of exclusive breastfeeding and recommendations related to the introduction of complementary solid foods very few followed the recommended guidelines related to infant feeding practices. The main reason for loss of exclusivity of breastfeeding was the introduction of formula feeds and the main reasons for the early introduction of complementary solid food were generally related to maternal interpretation of infant cues and behaviour.

Accurate monitoring of infant feeding practices is essential to ensure health service policy and plans reflect both state and national health priorities. The findings from this study will enable the Eurobodalla Child and Family Health Service to have a starting point to review the outcomes of any implemented practice changes resulting from the local implementation of the NSW Health Breastfeeding Policy.

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Appendix 1- Participant Information Sheet



Infant Feeding Practices in a Rural Community Health Setting

Background Information Sheet

My name is Barbara Fetherston. I work in the Eurobodalla Community Health Service as a Child and Family Health Nurse (C&FHN) and I am based at Batemans Bay Community Health Centre. I am currently researching infant feeding practices in a rural community health setting, with a scholarship awarded by the Rural Research Capacity Building Program of the NSW Institute for Rural Clinical Services and Training, (funded by NSW Health). As this is my first research project I will be supervised by an experienced researcher, Amanda Gear -Area Clinical Midwifery Consultant Nursing & Midwifery Greater Southern Area Health Service (GSAHS)

Background Information

In order to better improve our services to support woman in their feeding choices, we need to collect some information from you to obtain a better picture about how local infants are being fed.

What is this survey about?

The aim of this survey is to collect information on local infant feeding practices. These include breast feeding, bottle feeding and the introduction of water, fruit juice and solids. If you agree to be part of this research project you will be asked to complete a one-off questionnaire before your child has their six month immunisation. The survey consists of 28 questions. Some questions only need a Yes or No answer and some need you to work out the age of your child in weeks and some ask for a written response. It should take about 10-15 minutes to complete.

Why have you been chosen to participate in this research project?

The information we are interested in relates to infants that are aged six to eight months of age. In the child and family health clinics infants attending for a six month health screen can be anywhere from five to nine months of age, but the six month immunisation is only able to be given to infants

who are six months of age or older. This is why immunisation clinic clients instead of child and family clinic clients are being asked.

What will the findings be used for?

It is hoped that the findings from this survey will help the Eurobodalla Child and Family Health Service to provide services that will make babies as healthy as possible. The findings from the survey will be circulated in a report to local and area child and family health staff and management. The results may also be published in related journals and presented at conferences.

The results of this survey will remain anonymous and not be linked to any individual in any subsequent reports or journal articles that are developed from the findings.

Because it is essential that the research findings accurately reflect the current picture of what children are being fed at a local area level, I would ask you to be frank and honest when responding to questions as all responses are important. Your responses will not affect your relationship with GSAHS. However, as the survey is anonymous, if you do decide to withdraw at any point during the research your survey information would not be able to be separated from other participant information. However, any requests to withdraw would be noted and documented as a percentage of the total number of participants in the final report.

Further help

If you wish to discuss the study please contact:

Barbara Fetherston C&FHN Batemans Bay CHC – 4475 1620

E-mail: barbara.fetherston@gsahs.health.nsw.gov.au

Amanda Gear Area Clinical Midwifery Consultant Nursing & Midwifery

Ph: 02 6124 9829

E-mail: amanda.gear@gsahs.health.nsw.gov.au

This study has been approved by GSAHS Human Research and Ethics Committee (HREC)

If you wish to make a complaint about the conduct of this research please contact:

Complaints Officer,

GSAHS HREC, PO Box 3095,

Albury 2640.

PH 60808900

Fax 6080899

Appendix 2 – Participant Consent Form



Infant Feeding Practices in a Rural Community Health Setting Participant Consent Form

The researcher seeks your consent to participate in the above research

Please remember that your decision to participate is voluntary; you do not have to consent if you do not wish to participate. If you decide not to participate you do not have to give a reason.

The research team consists of:

Barbara Fetherston - Clinical Nurse Specialist - Women's Health and Child and Family Health

Batemans Bay CHC – 4475 1620 (Novice Researcher)

E-mail: barbara.fetherston@gsahs.health.nsw.gov.au

Amanda Gear - Area Clinical Midwifery Consultant Nursing & Midwifery Ph: 02 6124 9829

E-mail: amanda.gear@gsahs.health.nsw.gov.au (Research Supervisor)

Consent

As a participant in the above-named study:

- I have had the purpose of the research and any related benefits and risks explained to me by the researcher.
- I am aware that the research will involve:

The completion of a questionnaire on my child's feeding practices

I understand that as part of the study any information collected about me, as well as my personal details, is confidential, and that neither my name nor any other identifying information will be published

- I understand that as the survey is anonymous the information on my completed survey form would not be able to be separated from other participant's information if I decided to withdraw from the study. However any requests to withdraw would be noted and documented as a percentage of the total number of participants in the final report. Any future request to withdraw will not affect my relationship with the researcher or with Batemans Bay Community Health Centre where the study takes place, nor will it affect any health care treatment that I receive now or in the future.
- I have read and understood the written explanation provided to me on the participant information sheet and have been given this sheet to keep.
- I am aware of who to contact if I have any complaints about the conduct of the research and that these contact details can be found on the participant information sheet.
- I agree to participate in the above-named study

(Print) NAME:

Date:

Signature:

Appendix 3 – Infant Feeding Practices Questionnaire



ANONYMOUS SURVEY

DO NOT PUT YOUR NAME ON THIS FORM

To answer each question, circle the answer that best describes your situation. If the question doesn't relate to you please put a line through it instead of just leaving it blank.

Some questions require you to give a written response. This questionnaire is designed to be easy to answer, it should take no longer than 10 minutes to complete.

If more space is required for responses or comments please use the blank area at the end of the form or use the back of the form.

When the question asks for your response in weeks enter full numbers only – for example enter 1 week for one and a half weeks.

Baby's ages are calculated in weeks up until 6 months of age for example

1 month = 4 weeks	4 months = 17-18 weeks
2 months = 8 weeks	5 months = 21-22 weeks
3 months = 13 weeks	6 months = 26 weeks

QUESTIONS	RESPONSES	
1. Today's date		
2. Your child's date of birth		
3. Your age at your last birthday	Years old	
4. Do you attend Batemans Bay Child and Family Clinics	Yes	No
5. Do you have a Health Care Card from Centrelink	Yes	No
6. Has your child ever been breastfed?	Yes	No

7. Is your child currently breastfeeding?	Yes	No
8. The definition of exclusive breastfeeding means that your child only receives breastmilk or expressed breastmilk and no other liquids or solid foods with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines. Did you know that this is what exclusive breastfeeding means?	Yes	No
9. Is your child currently receiving expressed breastmilk?	Yes	No
10. If your child is currently receiving expressed breastmilk, what is the reason (s)?		
11. If you are no longer breastfeeding, how long did you feed your child in months and weeks?	Age in weeks =	
12. If you are no longer breastfeeding what was the reason (s) you stopped?		
13. If you did not breastfeed, what influenced this decision?		
14. Has your child ever had infant formula?	Yes	No
15. Has your child ever been given infant formula regularly? (Regularly means at least once a day)	Yes	No
16. At what age was your child first given infant formula regularly?	Age in weeks =	

17. What was the reason (s) your child started to have regular infant formula?		
18. What is the name of the infant formula your child is given?		
19. Why did you choose this infant formula?		
20. Have you changed formulas since starting to bottle feed?	Yes	No
21. If so what made you change to a different formula?		
22. Did you feel supported in your choice of infant feeding practice? How was this shown?		
23. Has your child had anything to eat or drink besides breastmilk or infant formula?	Yes water	No
	Yes fruit juice	No
	Yes solids	No
24. If your child has been given water at what age was your child given water regularly?	Age in weeks =	
25. Is your child having solid food regularly? (Regularly means at least once a day)	Yes	No
26. At what age was your child given solid food regularly?	Age in weeks =	
27. What influenced you to start your child on solids?		
28. Did you notice any changes in your child's growth or behaviour once they commenced on regular solids?		

Space for further responses if required or use back of page:

Thank you for taking the time to complete this questionnaire.

When finished please place in the survey box on the reception counter.

