Breastfeeding in Taiwan. An investigation into the prevalence of breast and formula feeding and the factors influencing the balance between them.

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Preface

I became interested in infant feeding while working in Neonatal and Paediatric Intensive Care Unit, where my ability in charting and calculation was highly appreciated as an aspect of skilled professional conduct. When I first came to London for the MSc. in Nutrition in King's College, breastfeeding was give considerable attention as neonatal and paediatric nutrition. After returning home, I started to query the lack of breastfeeding in Taiwan. While planning for further study, around 1999 and 2000, I contacted several experienced people in the hospitals where I used to work, seeking their advice about doing a project on breastfeeding. All of them gave me the same response that it was "Impossible! If you want to graduate, do something else that is feasible". Their response reflected the fact that I had never seen breastfeeding in Taiwan and did not see it until 2003, during my PhD study. The more people said breastfeeding was an impossible subject for a project, the more curious I became. Now, after several years working on it, I realise that I talked with the wrong persons. There were research studies on breastfeeding research, and it is a major subject in nursing training and a nursing specialty. I had talked with people with medical and dietetic background, who generally were not as up to date in this area as the nursing staff. I therefore decided to work on the topic.

I would like to thank my supervisor Tom Marshall, for all his help and time, which made the project possible. Also I thank my advisors Robert Pool and Ann Hill, for Robert's feedback of the qualitative researches, and Ann's solid knowledge about infant feeding. Moreover, the librarian, Mr. John Eyers offered me invaluable advice on databases and search terms for the reviews. I also would like to thank all my interviewees, my colleagues and friends in the Department of Health and the Bureau of Public Health in Taiwan, and those who helped me greatly in hospitals and schools in Taiwan with the field work. Dr C.H. Chen has offered me great and valuable support in Taiwan.

After completing this study, I have come to understand that breastfeeding is never a stand-alone issue. It interfaces with complicated social, financial, political and power issues either in home, in the hospital, in the working place or in larger society.

Hopefully the results of this research can bring about benefit of women and their families not only in Taiwan, but also all the Chinese speaking areas.

Abstract

Objective: This study aimed to build an understanding of the factors, determinants and correlates of breastfeeding of women giving birth in hospital in Taiwan. The qualitative phase of this study explored the women's experience and attitudes around childbirth, during hospital stay and after discharge. It also explored women's attitudes and experience of the Chinese traditional postpartum practice *"tso yueh tzu"* to frame a better understanding of women's early postpartum life. The survey aimed to investigate women's infant feeding behaviour at discharge, 1 and 3 months postpartum. It also quantified the magnitude of the factors identified by the qualitative method as associated with breastfeeding.

Method: There were qualitative and quantitative phases of this study. The qualitative phase had three separate stages of interviews. The first stage (stage A) used semi-structured interviews based on a topic list for a group of women before discharge, and at 1 & 3 months after birth. Stage A recruited a convenience sample of women selected on the nurses' account on their intention to breastfeed. The second stage (stage B) used unstructured interview recruiting women who had breastfed for more than 3 months by snowball sampling. The last stage (stage C) also used unstructured interview approaching women with purposed sampling intending to recruit women with wide variety of age and background. All interviews were tape recorded and transcribed to the original language. The narratives were analysed based on grounded theory.

The quantitative phase employed a structured survey conducted before discharge (face-to-face) and at 3 months (telephone) postpartum on women gave birth in two hospitals in north Taiwan. The data was entered and analysed by STATA 8.0.

Results: The quantitative phase revealed that childbirth was quite medicalised and some intrapartum interventions (e.g. episiotomy) caused considerable discomfort after birth, and disenabled women from the initiation of breastfeeding. During hospitalisation, inappropriate practices like mother baby separation and supplemental feeds jeopardised the establishment of breastfeeding. After returning home, some women regained their autonomy and managed to breastfeed more. Husbands and mothers-in-law played influential roles. While husbands' support was said to be important to encourage breastfeed, mothers-in-law generally had a negative influence. The working place was not supportive to breastfeeding and women who breastfed after returning to work found it difficult and exhausting. As to the traditional postpartum practice, according to the older women, the *"tso yueh tzu"* practice was to encourage breastfeeding, while young women reported that the tradition had made breastfeeding difficult.

The survey showed that the formula feeding rates were 36.9% and 54.4%; mixed feeding rates were 55.9% and 37.1%; exclusive breastfeeding rates were 7.1% and 8.5% at discharge and 3 months respectively. This study found that older, more educated women and women who lived independently were more likely to breastfeed at discharge and 3 months. Overall, husband's attitude was a significant factor encouraging breastfeeding, and women who lived with in-laws had much less chance to breastfeed both at discharge and 3 months. The mother-in-law's attitude and provision of information both had strong influence in favour of formula feeding. After adjusting for age, education, living with in-laws, and previous feeding experience, women with caesarean section had less breastfeeding at discharge, but no significant difference at 3 months; women formed their infant feeding intention late were more in favour of formula feeding at discharge and 3 month. Interventions including antenatal education, intrapartum epidural, early skin contact and room-in had no significant influence after adjusting for socio-demographic and intrapartum factors. Breastfeeding women tended to seek for information from the Internet.

Conclusion: In this study, we found that women's immediate social networks appeared to be more influential on infant feeding than the health care system. The current breastfeeding promotion programmes in Taiwan has strong health service orientation that may be undermined by this fact. The environment at home and in the working place also played important roles. Women who had strong intentions to breastfeed had to persevere to continue breastfeeding if the environment was not favourable. Programmes targeting husbands and mothers-in-law can be of public health significance.

1. Health benefits of breastfeeding

Breast milk is widely accepted as "the perfect food" for newborn infants. But to promote breastfeeding as a public health intervention for the wellbeing for both mothers and children, one has to quantify the benefits of breastfeeding and its impact on proposed area. In this chapter, I review the current state of knowledge on the health benefits of breastfeeding, for both child and mother, with respect to those aspects of health that are relevant to Taiwan. This review sets the background for the presentation of the study. Additionally, knowledge of the health benefits of breastfeeding, backed up where possible with estimates of their quantitative importance, is an important aid to planning any promotion of breastfeeding

Review strategy

The following aspects of health and illness are considered, as being of relevance to the Taiwanese situation

Child health:

- Gastrointestinal and respiratory infections
- Otitis media
- Atopic disorders
- Cognitive development
- Overweight and obesity
- Cardiovascular disease

Maternal health

- Ovarian cancer
- Breast cancer

After initial searches and consulting local expertise, I realised that the studies from Taiwan investigating the relationships between breastfeeding and health outcomes are lacking. There is even a relative lack of studies in populations of Chinese ethnicity elsewhere. Therefore, I had to include studies conducted in other countries and preferably industrialised areas (given that Taiwan especially Taipei and the other cities are highly industrialised - see later chapter.). Attention remains focused on health outcomes that are potentially important in Taiwan.

Hierarchy of evidence:

Not all health outcomes related to breastfeeding can be studied experimentally and blinding and randomisation of breastfeeding is not possible in most situations. Indeed, there have been relatively few randomised trials, but there is a range of reports of studies that are not randomised trials, but still yielded useful information. Moreover, the proposed topics in this chapter vary in their nature and the strengths and weakness of different studies have to be judged individually. The results shown in this chapter largely follow this conceptual hierarchy

of evidence [1].

a) Systematic reviews and meta-analyses
b) Randomised controlled trials
c) Cohort studies
d) Case-control studies
e) Cross-sectional studies (i.e., generally surveys)
f) Case-reports or case-series
g) Expert opinion without explicit critical appraisal, or based on physiology or laboratory research.

I used reference lists from these reviews to help locate key publications in the topic area, and with the understanding that the methodology of systematic review and meta-analyses is a relatively new skill. Not all the reviews were systematic, and non-systematic reviews have the risk of reviewer and information bias, a weakness that has to be bore in mind in assessing them.

If there was no review under a certain topic, I approached individual studies based on the above hierarchy. I summarised studies in tables (see later in this chapter) where there was a fair number of studies of sufficient quality.

Search strategy

Databases searched:

As a basis for this and other review chapters, I searched MEDLINE (1966-2005), EMBASE (1980-2005), SIGLE (grey literature) (1980-2005), HMIC (1979-2005), PsycINFO (1966-2005), CAB Abstract (1973-2005), PubMed, POPLINE, and Cochrane Library.

Search terms:

1. "breast feeding/" or "lactation/" or "milk, human/"(breastfeed$ or breastfed or breast-feed$ or breastfed).tw.
2. (breastmilk or babymilk or breast-milk or baby-milk).tw.
3. (breast adj4 (fed or milk or feed$)).tw. or (baby adj2 milk).tw. or (lactation or lactating).tw.
4. infant food/
5. (infant feeding).tw. or (infant formula) .tw
6. (breast milk substitute$).tw. or (breast-milk substitute$).tw. or (breastmilk substitute$).tw.
7. 1 or 2 or 3 or 4 or 5 or 6 or 7
8. limit 1-7 to human

Definition of breastfeeding:

It is worth noting that people define breastfeeding differently, and the confusion sometimes makes the interpretation of observed effects difficult. Many studies presented in this chapter

do not report how they defined breastfeeding and other feeding terms in reporting results.There are two sets of internationally recognised definitions of various breastfeeding terms that predominate currently in research and programme design [2, 3], but these are not, and have not been, uniformly applied. They and the process by which they come to be established are briefly sketched here.

Interagency Group for Action on Breastfeeding (IGAB) Consortium Definitions

In 1988, a meeting was held on definitions related to breastfeeding. It was sponsored by the Interagency Group for Action on Breastfeeding (IGAB), an *ad hoc* working group of representatives from the United Nations Children's Fund (UNICEF), the United States Agency for International Development (USAID) and the World Health Organisation (WHO). In addition to these organisations, various relevant professional and academic groups were represented and/or contributed input and reviews to the meeting. The completed definitions were then reviewed and modified with input from more than 50 other breastfeeding research and programme experts from developed and developing countries. The final report was completed and submitted for publication in 1990 [4]. This set of definitions is suggested to authors by several journals, including the Journal of Human Lactation. The purpose of bringing together this breadth and depth of experts was to ensure that any agreed definition of breastfeeding would serve research and program needs, as well as be useful in physiological research on the mother or the child. The parameters agreed upon for a definition include:

- A definition only applies to a single time, perhaps a 24-hour recall.
- It defines only breastfeeding and does not define other forms of feeding.
- It differentiates breastfeeding from breast-milk feeding.
- It encourages further description when the basic definitions are used.

The agreed definitions as worded in the final document are:

- Exclusive breastfeeding: No other liquid or solid from any other source enters the infant 's mouth.
- Almost exclusive: Allows occasional tastes of other liquids, traditional foods, vitamins, medicines, etc.
- Full breastfeeding: Includes exclusive and almost exclusive.
- Full breastmilk feeding (or fully breastmilk fed): The infant receives expressed breastmilk in addition to breastfeeding.
- Partial: Mixed feeding, designated as high, medium, or low. Methods for classification suggested include percentage of calories from breastfeeding, percentage of feeds that are breastfeeds, etc. Any feeding of expressed breast milk would fall under this category.
- Token: Minimal, occasional breastfeeds (for comfort or with less than 10 % of the nutrition thereby provided.)

WHO Breastfeeding Definitions

A related set of definitions of breastfeeding was developed by WHO/UNICEF and published in 1989 [5], which, in principle, built upon the earlier (IGAB) set of definitions. However, one might interpret the WHO/UNICEF definitions as designed to study only what enters the infant's mouth, geared to the study of infant nutrition [3]. This newer set of definitions does not take into account [3]:

- Impact of direct breastfeeding compared to indirect breastmilk feeding on maternal physiology and maintenance of milk supply
- The contrasting definitions used in research studies cited
- The immunological and other differences for the infant between breastfeeding and breastmilk feeding.

The WHO/UNICEF definitions are [5]:

- Breastfeeding: The child has received breast milk direct from the breast or expressed.
- Exclusive breastfeeding: The infant has received only breast milk from the mother or a wet nurse, or expressed breast milk, and no other liquids or solids with the exception of drops or syrups consisting of vitamins, mineral supplements, or medicines.
- Predominant breastfeeding: The infant's predominant source of nourishment has been breast milk. However, the infant may also have received water and water-based drinks (sweetened and flavoured water, teas, infusions, etc.), fruit juice; oral rehydration salts solution (ORS), drop and syrup forms of vitamins, minerals and medicines, and ritual fluids (in limited quantities). With the exception of fruit juice and sugar water, no food-based fluid is allowed under this definition.
- Full breastfeeding: Exclusive breastfeeding and predominant breastfeeding together constitute full breastfeeding.
- Complementary feeding: The child has received both breast milk and solid or semi-solid food.
- Bottle-feeding: The child has received liquid or semi-solid food from a bottle with a nipple/teat.

The impact of the lack of consistency:

Variance between definitions of the same words makes it more difficult to interpret breastfeeding research and to apply an evidence-based approach to the understanding of breastfeeding 's impact on the health of mother and child.

The interpretation of breastfeeding research is further complicated by issues of methodological weakness, publication bias, misinterpretation, and confused conclusions [6].

1.1 Child Health

Gastrointestinal and Respiratory Infection

Though as a rule not lethal, gastrointestinal and respiratory tract infections are common morbidities among neonates and children in Taiwan. According to local reports [7], diarrhoea and fever or other gastrointestinal and respiratory tract infections are the commonest reasons for children under 5 presenting to the health care system. The expenses dealing with these minor to moderate illness are costly to the National Insurance in Taiwan [7].

The conclusions of studies of gastrointestinal infections in industrialised countries are shown in table 1.1. Most showed a protective effect. In nearly all reports of non-specific GI infection, outcomes were based on parental report of illness on a provided list of symptoms. The evidence from studies of respiratory illness in industrialised countries has been mixed but the overall trend favours breastfeeding (table 1.2). Observational studies are complicated by many factors and only one randomised-controlled trial (RCT) is available [8, 9] (see detail in section 4.6, the PROBIT), which showed a protective effect of breastfeeding. Among 16 studies meeting the review criteria, three [10-12] showed no significant association.

Otitis media

Otitis media is a common problem in young infants and a resulting impairment of hearing can influence learning outcomes in later childhood. In Taiwan, one in ten infants were admitted to hospital at least once during the first 6 months of life with otitis media and one third of these experience recurrence by 12 months of age[7]. Many of the studies reviewed (table 1.3), showed a protective effect of breastfeeding on (acute) otitis media or otitis media with effusion.

The protective effects of breastfeeding against ARI may be attributed to both the constituents of breast milk that differ from formula, and the different muscle movement patterns acquired for breastfed and bottle-fed infants [13].

Table 1.1: Studies investigating associations between breastfeeding and diarrhoeal morbidity in industrialised countries

Author, year	Country and setting	Design, N	Age group	BF practice	Effect	Outcomes & Comment
Duffy [14], 1986	US, urban	Prospective, 197	< 4 mo	EBF vs. MF+FF	NS	ARR of non-specific gastroenteritis. Adjusted for most know confounders.
Rubin [11], 1990	Demark, urban	Prospective, 500	< 12 mo	BF>FF vs. BF≤FF	NS	Incidence of diarrhoea. Miss-classification may be a limitation. High drop-out rate.
Howie [15], 1990	Scotland, Dundee	Prospective / retrospective, 674	0-13 wk 14-26 wk 27-39 wk 40-52 wk	Full BF vs. MF+FF+ early (< 13wk) weaned	6.6-16.8%* 4.0-16.2%* 2.5-16.1%† 5.1-18.5%†	Adjusted reduction of incidence of diarrhoea. Adjusted for social class, maternal age and parental smoking. † p<0.05; *p<0.01
Ruuska [16], 1992	Finland, urban	Prospective, 336	0-6 mo	BF<6 mo BF≥ 6 mo	2.42[a] 1	OR of occurrence of acute diarrhoea. Confusing study e.g. showing infants at age 0-6 m and BF > 6 mo have fewer episodes of diarrhoea as compared with BF < 6 mo. Without adequate control.
			7-12mo	BF<6 mo BF≥ 6 mo	NS	
			13-24 mo	BF<6 mo BF≥ 6 mo	NS	
Dewey [10], 1995	US, urban	Prospective, BF= 45, FF=41	0-11 mo	BF FF	0.14 0.81, p<0.01	Adjusted incidence = number of diarrhoea episodes per 100 days at risk. FF included BF< 3 mo; BF= breast milk is the major form of milk. Adjusted for most known confounders.
			12-24 mo	BF FF	NS	
Scariati [17], 1997	US, nationwide	Longitudinal , 743	2-7 mo (diarrhoea)	EBF MF FF	1 0.9-1.3 1.8 (p<0.05)	AOR of experiencing diarrhoea. Information was collected by mailed questionnaires. Letter. Adjusted for maternal and familial confounders.
			2-7 mo (ear infection)	EBF MF FF	1 1.2-1.6 1.7 (p<0.05)	
Kramer [8] , 2001	Belarus, urban and rural	RCT, 16491	0-12 mo	Intervention Control	0.6 (0.4-0.91) 1	AOR (CI) for more than 1 episode of GI infection
				Intervention Control	0.54 (0.31-0.95) 1	AOR (CI) for atopic eczema

EBF = exclusive breastfeeding, MF= mixed feeding, BF= breastfeeding, FF= formula feeding,; A adjusted; OR= odds ratio; AOR= adjusted odds ratio; RR= relative risk; ARR= adjusted relative risk; NS= not significant ; CI= 95% confidence interval; a: confidence interval not reported.

Table 1.2: Studies investigating associations between breastfeeding and respiratory morbidity in industrialised countries

Author, year	Country and setting	Design, N	Age group	BF practice	Effect	Outcomes & Comment
Cunningham [18], 1977	US, rural	Retrospective, 285	< 12 mo	EBF FF	0.5 0.1	Episodes of respiratory infections/ 1000 wk of observation
			< 12 mo	BF FF	0.1 5.6	
Forman [19], 1984	US rural (American Indians)	Retrospective , 571	< 12 mo	MF FF	0.61 1 (p=0.05)	AOR of first episode of respiratory infection for which treatment was sought at hospital. Adjustment is not adequately described.
			< 4 mo	EBF FF	0.48 1 (p=0.02)	
Wright [12], 1989	US, urban	Prospective / retrospective, 1000	< 12 mo	BF FF	NS	AOR of hospitalisation with pertussis-like illness
			< 4 mo	BF> 1 mo BF< 4 mo	1 1.7 p< 0.05	AOR of wheezing during infancy. Only < 4 mo was significant. Adjusted for familial and child confounders.
Rubin [11], 1990	Demark, urban	Prospective, 500	0-12 mo	EBF BF>FF vs. BF<FF&FF	NS	AOR for respiratory infections. Adjusted for environmental and child factors. Classification of feeding practices is a limitation. High dropout rate (23%).
Howie [15], 1990	Scotland, Dundee	Prospective, 674	<24 mo	Full BF MF FF	25.6% 24.2% 37% p<0.05	Adjusted prevalence of respiratory infection during the first 13 weeks of life. Adjusted for social class, maternal age and parental smoking.
Pisacane [20], 1994	Italy, urban	Case-control, 73 vs. 88	<6 mo	BF BB	0.22 (0.09-0.55) 1	ARR (CI) for hospitalisation with pneumonia or bronchiolitis hospital-based controls may introduce unknown bias.
Douglas [21], 1994	Australia, urban	Prospective , 836	<24mo	Duration of MF Month 0 1-3 4-6 7-12 >12	OR 5.6 6.1 6.5 6.5 7.0 (p=0.006).	OR for respiratory illness in the 2nd year of life. Poor definition of BF and very high dropout rates (35%). Finding is controversy with other publications. Children exposed to smoking had fewer episodes than those who didn't.

Table 1.2 *(continued)*: Studies investigating associations between breastfeeding and respiratory morbidity in industrialised countries

Author, year	Country and setting	Design, N	Age group	BF practice	Effect	Outcomes & Comment
Wright[22], 1995	US, urban	Prospective/ retrospective, 1246	6 years	BF< 1mo FF	1 3.03 (p<0.01)	AOR of recurrent wheezing at 6 yr for nonatopic children only. NS for atopic children. Controlled for many confounders but not familial factors.
Dewey [10], 1995	US, urban	Prospective, 87	0-12 mo	BF FF	NS	Adjusted incidence of respiratory infection: number of days with respiratory illness / 100 days at risk. FF include BF< 3 mo BF= breast milk is the major form of milk. After adjusting no of siblings and day care, NS.
			12-24 mo	BF BB	NS	
Beaudry[23], 1995	Canada, New Brunswick	Retrospective, 776	0-6 mo	BF vs. FF	RI: 0.78 (0.61-1.00) HA: 0.32 (0.14-0.72)	AOR (CI) for respiratory illness (RI) and hospital admissions (HA). Adjusted for maternal age, smoking and socioeconomic status. Retrospective data collection may introduce bias.
Silfverdal[24], 1997	Sweden, county	Prospective case-control, 55 vs. 139	Not report	EBF≤12 wk EBF>13 wk	3.79 (1.6-8.8) 1	AOR (CI) for *Haemophilus Influenza* (HI) infection by duration of EBF.
				MF≤20 wk MF>21 wk	NS	AOR for *Haemophilus Influenza* (HI) infection by duration of MF.
Scariati [17], 1997	US, nationwide	Longitudinal	2-7 mo	EBF MF FF	1 1.2-1.6 1.7 (p<0.01)	AOR of experiencing respiratory infections. Information was collected by mailed questionnaires. Letter. Adjusted for maternal and familial confounders.
Cushing [25], 1998	US, urban	Prospective, 1202	< 6 mo	Full BF FF	0.81 (0.68-0.96) 1	AOR for incidence of lower respiratory tract infection. Adjusted for maternal, child and environmental factors.
Nafstad[26], 1996	Norway, urban (Oslo)	Prospective, 3754	< 12mo	BF FF	LRTI: 1 1.7 (1.2-2.5) HI: 1 4.6 (2.5-8.3)	AOR (CI) for episodes of lower respiratory infections (LRTI) and hospital admissions (HI) of infants with smoking mothers by feeding methods. Respondent bias (smoking vs. non-smoking mothers).
Levine[27], 1999	US & Canada/ urban	Case-control, 187 vs. 280	2-11 mo	Current BF (BF in the preceding 2 weeks) vs. FF	027 (0.18-0.85) 1 (p<0.01)	AOR for invasive pneumococcal disease (IPD), separate for age groups 22-11, 12-23, and 24-59 mo. Significant in the 2-11 mo age group. Letter
Kramer [8], 2001	Belarus, urban and rural	RCT, 16491	0-12 mo	Intervention Control	0.87 (0.59-1.28) 1	AOR (CI) for respiratory infection. Not significant

Table 1.2 *(continued)*: Studies investigating associations between breastfeeding and respiratory morbidity in industrialised countries

Author, year	Country and setting	Design, N	Age group	BF practice	Effect	Outcomes & Comment
Oddy [28] , 2002	Australia	Prospective, 2602	0-12 mo	Predominant BF Never/ ever < 2mo/ 2 mo+ < 4mo/ 4 mo+ < 6mo/ 6 mo+ < 8mo/ 8 mo+ Any BF Never/ever < 2mo/ 2 mo+ < 4mo/ 4 mo+ < 6mo/ 6 mo+ < 8mo/ 8 mo+	AOR 1.61(1.05-2.48) p=0.029 1.36(0.99-1.88) p=0.059 1.70(1.25-2.30) p=0.001 2.07 (1.47-2.9) p<0.005 1.61(1.08-2.40) p=0.018 1.62(1.06-2.49) p=0.026 1.60(1.14-2.24) p=0.007 1.56(1.14-2.12) p=0.005 1.60(1.17-2.17) p=0.003 1.76(1.27-2.44) p=0.001	AOR for four or more visits to hospital, doctor, or clinical visits due to upper respiratory infection. Adjusted for gestational age, gender, smoking during pregnancy, older sibling, maternal education, and maternal age at time of birth.

Table 1.3: Studies investigating associations between breastfeeding and otitis media in industrialised countries

Author, year	Country,	Design, No	Age group	BF practice	Effect size	Outcomes & Comment
Duncan [29],1993	US, urban	Retrospective, 1220	<12 mo	FF&BF< 4mo Suppl< 4mo Suppl 4-6 mo Suppl ≥6 mo FF&BF< 4mo Suppl< 4mo Suppl 4-6 mo Suppl ≥6 mo	ROM (CI) 1.0 0.73 (0.60-0.90) 0.54 (0.35-0.81) 0.39 (0.21-0.73) AOM (CI) 1.0 0.85 (0.74-0.97) 0.72 (0.54-0.95) 0.61 (0.40-0.92)	AOR for recurrent otitis media (ROM) and acute otitis media (AOM). Review of medical charts. Controlled for marital status, family history of allergy, child and familial factors.
Owen [30], 1993	US, urban	Prospective, 698	<6 mo	BF Any vs. Never at 6 m	8.1% vs. 10.2% (p<0.01)	Adjusted incidence of otitis media. Adjusted for environmental and familial factors.
Aniansson [31], 1994	Sweden, urban	Prospective, 400	< 12 mo	EBF MF weaned	1-3m 4-7m 8-12m 1% 4% 0% 5% 7% 9% 6% 14%* 20%*	Percent of children with acute otitis media by age group. * significant difference (p<0.05) in comparison with EBF.
Dewey, [10] 1995	US, urban	Prospective, 87	<12 mo >12 mo	BF vs. FF BF vs. FF	0.45 vs. 0.53 (p<0.05) NS	Adjusted incidence of otitis media / 100 days at risk .The mean duration of episodes of otitis media was longer in FF (p = 0.01) at 2 y. Adjusted for most known confounders.
Duffy [14]1997	US, suburban	Prospective, 306	<3 mo	MF FF	not reported 1.22 (1.08-2.45)	Overall RR of first episode of acute otitis media and otitis media with effusion in compare with EBF during the first 12 mo of life. Letter. Adjusted for parental smoking and family history, but socioeconomic and educational factors were not adjusted.
			3-6 mo	MF FF	1.28 (1.02-3.44) 1.59 (1.05-4.32)	
			> 6 mo	MF FF	1.30 (1.13-3.11) 1.70 (1.22-3.46)	
Daly[32], 1999	US, rural, 596	Prospective, 596	0-59 mo	EBF ≥ 3 mo Yes No	 0.8 (0.6-0.96) 1	RR for otitis media. NS in multivariate model. Low withdraws rate. Co-variates in the multivariate model are not adequately described.
				EBF = 6 mo Yes No	 0.7 (0.5-0.98) 1	

EBF = exclusive breastfeeding, MF= mixed feeding, BF= breastfeeding, FF= formula feeding, suppl= supplementation A adjusted; OR= odds ratio; RR= relative risk; NS= not significant ; CI= 95% confidence interval.

Atopic disorders

It has only been recently that "exclusive" breastfeeding has been accurately defined, and the protective effects of exclusive breastfeeding against allergic disorders have been more clearly understood [33]. In Taipei, 25% of under 1-year infants have atopic dermatitis and about a third of pre-school children have allergic rhinitis; at the age of 15 years, 9.8% of the children in Taipei have allergic asthma. Moreover, the prevalence of atopic disorders in Taiwan has increased 7-fold in the recent decade [34].

The literature regarding the relationships between infant feeding practice and the development of atopic diseases is conflicting. Although some studies have shown no significant relation [35, 36] , some others have found a protective effect of breastfeeding [37-39]. A meta-analysis of 6 prospective studies [40] found insignificant effect of exclusive breastfeeding on allergic rhinitis for children under 3 months (OR:0.74 95% CI:0.54-1.01) and for children with family history (OR:0.87; 95% CI:0.48-1.58). Gdalevich et al [41] conducted a systematic review with meta-analysis of 18 prospective studies to evaluate the association between exclusive breastfeeding during the first 3 months and atopic dermatitis. They reported a pooled OR for the protective effect of exclusive breastfeeding of 0.68 (95% CI, 0.52-0.88); the effect was higher in children with a family history of atopy (OR: 0.58; 95% CI:0.41-0.92) than in those of combined populations (OR:0.84; 95% CI: 0.59-1.19), though the difference in OR's is within their respective confidence intervals. Children without a history of atopy in first-degree relatives showed no association between breastfeeding and the onset of atopic dermatitis (OR:1.43;95% CI: 0.72-2.86). Table 1.4 shows 14 prospective studies evaluating the association between exclusive breastfeeding and the risk of bronchial asthma. It is difficult to form an overall, synthesised view from this, and it has not been attempted. However, the results as a whole suggest that exclusive breastfeeding has substantial protective effect against asthma for children with family history, with the effect less for the general population.

Cognitive development

The effect of breastfeeding on later brain development is controversial. Women who chose to breastfeed have different attributes from those choosing not to. Breastfeeding women in Western countries tend to have higher education, be of higher socio-economic status and be older. These factors are associated with better developmental outcomes for infants. However, breastfeeding is a time for mother-infant bonding and early interaction between mothers and infants seems to help the relationship and may further affect developmental outcomes. Several studies evaluated developmental or cognitive outcomes in breastfed babies (table1.5); I include only studies comparing predominately breastfed babies (predominant or exclusive breastfeeding) with formula-fed babies. Anderson et al [42] conducted a meta-analysis evaluating the cognitive differences between different feeding practice. After adjustment, the increment in cognitive function was 3.16 (95% CI: 2.35-3.98) IQ points in breast-fed children at 6-23 months. Significantly higher levels of cognitive function were seen in breast-fed than in formula-fed children at 6-23 months of age, these differences being stable across successive ages. Low-birth-weight infants showed larger differences (5.18 points; 95%CI: 3.59-6.77) than did normal-birth-weight infants (2.66 points; 95% CI: 2.15-3.17). A more

recent review [43] identified 40 publications from 1929 to 2001. Twenty-seven (68%) concluded that breastfeeding promotes intelligence. The authors concluded that many studies had methodological flaws. Only two studied full-term infants and were classified as based on high quality data, controlled for critical confounders, reported blinding, and used appropriate tests. Of these, one concluded that the effect of breastfeeding on intellect was significant ($p<0.05$), and the other did not [43].

Though the effects have been controversial, the potential benefits on brain and cognitive development has been a good promotion strategy of breastfeeding in industrialised countries like Taiwan [44].

Table 1.4: Studies investigating associations between breastfeeding and the risk of bronchial asthma: prospective studies comparing predominate BF vs. FF children

Author , year	Country,	Age at end of follow-up (yr)	N	Population*	Duration of BF	EBF	Diagnostic criteria	Control for confounders	OR (95% CI)
Gruskay [45], 1982	Italy	3	328 581	A N	3 wk	+	+	-	0.85 (0.21-2.62) 0.48 (0.01-3.30)
Businco [46], 1982	Italy	2	101	A	6 mo	+	+	-	0.26 (0.03-1.28)
Chandra [47] , 1991	Canada	1.5-5	263	A	3 mo	+	+	+	0.35 (0.12-0.88)
Hide [48], 1981	UK	4	167 319	A N	3 mo	+	+	-	0.73 (0.13-2.82) 1.26 (0.34-4.00)
McConnochie [49], 1986	US	8.4	202 908	A N	6 mo	+	+	+	0.48 (0.13-1.59) 0.00 (0.00-4.13)
Fergusson [50], 1983	NEW Zealand	4	202 908	A N	4 mo	+	+	-	1.19 (0.21-4.58) 1.02 (0.35-2.48)
Marini [51], 1996	Italy	1-3	63	A	4 mo	+	+	+	0.50 (0.26-0.91)
Wilson [52], 1998	UK	7.3	545	C	15 wk	+	+	+	0.47 (0.18-1.07)
Oddy [53],1999	Australia	6	2187	C	4 wk	+	+	+	0.80 (0.66-0.98)
Tariq [54],1998	UK	4	1086	C	3 mo	+	+	+	0.55 (0.37-0.82)
Gordon [55],1982	UK	2	239	C	3 mo	+	+	-	0.39 (0.37-1.37)
Wright [22], 1995	US	6	970	C	3 mo	-†	+	+	0.67 (0.36-1.25)
Kull [56], 2002	Sweden	1-2	4089	C	4 mo	+	+	+	0.7(0.5-0.8)
Dell [57], 2001	Canada	1-2	2184	C	9 mo	-	+	+	0.42 (0.16-1.05)

* A: children with family history of atopy; N: children without family history of atopy. C: combined population; †: full BF

Table 1.5: Studies investigating associations between breastfeeding and intelligence: studies comparing breastfed vs. formula-fed infants

Study	No	Tests to evaluate outcomes	Comment	Adjusted factors, by type of factor	Adjusted mean difference
Rogers[58], 1978	2424	8 y: picture intelligence; 15 y: nonverbal ability, sentence completion	1946 cohort, tests not adequately described.	S,MI,ME,PE,SES,F,BO, BW,CE	3.04*
Fergusson [59], 1982	1037	3 y: Peabody Picture Vocabulary test; 5 y: Stanford Binet, 7 y: WISC-R	Controlled for many variables, including home environment.	A,MI,ME,MT,SES,BW,GA,CE	2.09*
Ounsted[60], 1984	242	7.5 y: British Ability Scale	All mothers had hypertension. Outcome with very large CI.	A,MA,SES,BO,BW	5.61
Morley[61], 1988	771	18 mo: Bayley Developmental Profile II	LBW, neuroimaging not addressed.	S,MS,MA,ME,SES,BO, BW	4.36*
Morrow-Tlucak[62], 1988	229	6, 18, and 24 mo: Bayley	Difference only significant at 12 and 24 mo, Low SES group.	S,MS,MI,ME,MT	4.72*
Doyle[63], 1992	96	2 y: Bayley; 5 y: WPPSI; 8y: WISC	Letter, LBW	MI,ME,MT,SES	5.02*
Jacobson[64],1992	323	4y: McCarthy	Letter. Same cohort as 1999 study,	S,MA,ME,R,SES,BO,BW, GA	1.71
Lucas[65], 1992	283	7.5-8.0 y: WISC-R	No discussion of neuroimaging or neurological status, LBW	S,MA,ME,R,SES,BO,BW,GA	8.30*
Rogan [66], 1993	855	6, 12, 18, 24 mo: Bayley; 3, 4, 5 y: McCarthy	Not always blinded; PCB cohort.	S,MS,MA,ME,R,SES,BO	2.70*
Temboury [67], 1994	229	18-29 mo: Bayley	Lower results on the Index of Motor Development were associated with lower and lower-middle SES.	S,MA,ME,SES,F,BW	4.36
Florey[68], 1995	592	18 mo: Bayley	BF by retrospective record review	S,MA,MS,ME,SES,BW	3.70*
Jacobson [69], 1999	323	4, 11 y: Peabody Picture Vocabulary test, WISC	Mothers consume at least 11.8 kg of fish over 6 years from a specific lake.	S,MA,ME,R,SES,BO,BW,GA	4.72
Horwood[70], 2001	280	7-8 y: WISC-R	Only verbal intelligence quotient scores were significant, VLBW.	S,MA,ME,SES,F,BW,GA	6.0*

*: Significant ($p<0.05$); WISC= Wechsler Intelligence Scale for Children (revised); Bayley= Bayley Scale of Infant Development; McCathy: McCathy Scales of Children's Ability; (V) LBW= (very) low-birth-weight; WPPSI= Wechsler Preschool and Primary Scale of Intelligence, PCB= polychlorinated biphenyls; SES= socioeconomic status; S = sex; MS= maternal smoking; MA= maternal age; MI = maternal IQ; ME= maternal education; MT= maternal training; PE= paternal education; F= family size; BO= birth order; BW= birth weight; GA= gestational age; CE= childhood experience.

Overweight and obesity

Several studies have examined the association between breastfeeding and childhood obesity (table 1.6); only 2 studies located in this search examined the effect on adulthood obesity [71, 72]. The design, proportion of breast-fed infants and age of follow up varied among studies. The definition of breastfeeding included exclusive and mixed-feeding, and infants were breast-fed for varying durations (<2, 3 or 5 mo). Of twenty studies reviewed, 12 found non-significant associations of breastfeeding and later obesity [71, 73-81]; only 2 studies [72, 82] reported a protective effect for later body fatness. Five studies [83-87] found a protective effect of breastfeeding on against childhood obesity. An effect of breastfeeding on later obesity, if any, is probably weaker than genetic and environmental factors. Also an observed association between breastfeeding and later obesity does not prove causality. Controlling for confounders was done to various extents across the studies. In several later studies, adjustment removes the effect of breastfeeding. All the pertinent confounders have not necessarily been measured and whether the differences between breastfeeding and formula-feeding mothers have been controlled adequately is always questionable.

In Taipei, 20% school children are either overweight or obese [34], and there has been an increasing trend over the last decade. Though the protective effect of breastfeeding on later obesity remains controversial and difficult to study, breastfeeding promotion might be one of the interventions that could halt or reduce the rising trend of childhood obesity in Taiwan.

Cardiovascular disease

It has been hypothesised that nutrition early in infants' development affects later blood pressure. Also, it is not clear if the relation between low birth weight and later high blood pressure is due to poor foetal nutrition or growth before full term. In 1994, Lucas et al [88] reported a prospective randomisation of 758 pre-term infants (birthweight <1850g) to early diets differing greatly in nutrient content in the ICU, with blinded follow-up 7.5-8 years later. They found there were major differences in nutrient intake from the randomised diets (pre-term formula vs. standard formula and pre-term formula vs. donor breast milk; in each case with or without mother's milk), but follow up showed no differences in later blood pressure. It appears that extremes of nutritional intake and growth performance in preterm infants do not programme later blood pressure at 7.5-8 years of age. The authors suggested that the long-term rise in blood pressure reported in individuals who had low birthweight (at full term) is not due to poor foetal nutrition or growth as such. However, they did not specifically analyse the association of birthweight and later blood pressure.

In 2003, Owen et al [89] conducted a systematic review and meta-analysis to determine whether breastfeeding compared with bottle-feeding is associated with lower mean blood pressure at different ages. They searched EMBASE, Medline, and Web of Science databases, and the pooled estimated mean difference in systolic blood pressure was -1.10 mm Hg (95% CI: -1.79 to -0.42 mm Hg) but with significant heterogeneity between estimates ($p < 0.001$). The difference was largest in studies of < 300 participants (-2.05 mm Hg, -3.30 to -0.80 mm Hg), intermediate in studies of 300-1000 participants (1.13 mm Hg, -2.53 to 0.27 mm Hg), and smallest in studies of > 1000 participants (-0.16 mm Hg, -0.60 to 0.28 mm Hg). The

difference was unaltered by adjustment for current size and was independent of age at measurement of blood pressure (birth to 6, 6 to 12, 12 to 18, and 12 to 24 months) and year of birth. Diastolic blood pressure was not significantly related to type of feeding in infancy. They concluded that small studies with positive findings may have exaggerated claims that breastfeeding in infancy reduces systolic blood pressure in later life. The results of larger studies suggest that feeding in infancy has at most a modest effect on blood pressure, which is of limited clinical or public health importance.

In 2005, Martin et al [90] conducted a systematic review of published studies from which estimates of a mean difference (standard error) in blood pressure between breastfed and bottle-fed subjects could be derived. They searched MEDLINE and EMBASE, supplemented by manual searches of reference lists. Fifteen studies including 17,503 subjects (From these 15 studies, 17 estimates of systolic blood pressure differences were derived, of which 12 included males and females combined and five were sex specific. Eleven systolic blood pressure observations (nine studies) were of children i.e. aged 1–16 years, and six observations (five studies) occurred in later adulthood i.e. aged ≥17 years) were summarised. Systolic blood pressure was lower in breastfed compared with bottle-fed infants (pooled difference: –1.4 mmHg, 95% CI: –2.2 to –0.6), but evidence of heterogeneity between study estimates was evident ($p < 0.001$). A lesser effect of breastfeeding on systolic blood pressure was observed in larger (n ≥1,000) studies (–0.6 mmHg, 95% CI: –1.2 to -0.02) compared with smaller ($n < 1,000$) studies (–2.3 mmHg, 95% CI: –3.7 to –0.9) ($p = 0.02$ for difference in pooled estimates). A small reduction in diastolic blood pressure was associated with breastfeeding (pooled difference: –0.5 mmHg, 95% CI: –0.9 to –0.04), which was independent of study size. The authors concluded that if causal, the small reduction in blood pressure associated with breastfeeding could confer important benefits on cardiovascular health at a population level.

These studies give some support for the existence of a link between breastfeeding and later raised blood pressure. However, it is not consistent and tends to be less in larger studies, so the support is not definite. The changes in mean blood pressure are small and it is hard to support a conclusion of changes of real importance.

Nevertheless, hypertension is potentially a problem among children in Taiwan. A school survey in Taipei recruiting all children (n=125600) in 14 local primary schools showed that 1/12 of children aged 8-12 had mild to moderate hypertension (not defined) [91]. Another hospital-based study also revealed that 76.8% obese children (BMI>28kg/m^2) under 16 attending weight management clinic had hyperlipidaemia [92].

Table 1.6: Studies investigating associations between breastfeeding and childhood obesity: studies comparing breastfed (BF: definition see below) vs. formula-fed subjects.

Study	Design	No of subjects	Follow-up at or age	Definition of BF	Outcome variables	Results (BFvs.FF)
Charney [71],1976, US	Retrospective, 1945-1955	366 (BF=65, FF=301)	20-30 y	BF>2 WK	Overweight:>10% median wt and age; obese: >20% median wt. for ht. and age at 20-30 years	All NS
Dine [75], 1979 US	Prospective	476 (BF=70, FF=406)	0,3,6, 12 mo, 2,3,4,5 y,	Exclusive BF	BMI over 1st 5 years	NS
Marmot [72], 1980, UK	Prospective	172 (BF=125, FF=47)	2 mo, 2 y, 32 y	Exclusive BF first 5 mo	BMI, wt, skinfold	BMI. Wt, tricepts BF>FF among males
Kramer [85], 1981, Canada	Case control	297: (BF=55, FF=242)	12-18 y	BF :≤ 1bottle/d	Obese: >120%wt for ht and age and skinfold >95th or both> 90th percentile	ARR: 2.25 (1.48-3.01) if not BF, increasing with BF duration (p=0.025).
Vobecky [80], 1983, Canada	Prospective	170	Regularly for 3 y	BF>2 wk	Wt for ht and for age	Both NS
Fomon[19], 1984, USA	Prospective,	432 (BF=156, FF=276)	0-112 d, 8 y	Partial feeding	BMI, wt, skinfold	All NS
Kramer [93, 94], 1985, Canada	Prospective	382, 347 (BF=58% at birth)	1-3 d, 2,4,6 wk; 2,3,4 mo; 1.2.y	Exclusive BF: no regular bottle feeding	BMI, skinfolds, at one and two years	BMI at 1y, 2y (both p<0.0001); skinfolds at 2 y (p=0.002). -ve correlation with BF duration
Birkbeck [74] , 1985, New Zealand	Prospective	562 (BF=280, FF=382)	0,3,7 y	Exclusive BF or FF for at least 12 wk	BMI, skinfolds, at 7yr	Both NS
Agras [95] , 1990, US	Prospective	54 (BF=36, FF=18)	2,4 wk; 12, 20, 24 mo	BF≥5 mo	BMI, skinfolds, at 3 and 6 years:	BMI positive association with BF>5 mo (p<0.05).
Baranowski [73], 1990, US	Retrospective	246	3-4 y	Not mentioned	BMI, wt and skinfolds	All NS
Strbak [86] , 1991, CSFR	Prospective	NA	0-7 y	BF< or > 3 mo	Percentage obesity	higher if BF< 3mo
Zive [96], 1992, US	Retrospective	270 (BF=84% at birth)	4 y	Not mentioned	BMI, skinfolds	Duration of BF and BMI, skinfolds: NS

Table 1.6 *(continued)*: Studies investigating associations between breastfeeding and childhood obesity: studies comparing breastfed (BF: definition see below) vs. formula-fed subjects.

Study	Design	No of subjects	Follow-up at or age	Definition of BF	Outcome variables	Results (BFvs.FF)
Elliott [76], 1997, US	Prospective	136	Adolescence grade 10	FF or BF ≤ 2 mo n=63; BF< 2 mo n=73	Obese: >85 th percentile BMI	Obese: NS after adjustment
O'Callaghan [78], 1997, Australia	Prospective	3909 (BF=3119, FF=790)	0,5 y	BF duration	Obese: severe > 94th and moderate 85-94th percentile BMI	Moderate obesity: duration of BF: NS; severe obesity: RR higher 4-6 mo BF; adjusted OR: NS
Wilson [52], 1998,UK	Prospective	545 (BF=344, FF=201)	0-2 y, 7.2 y	Exclusive BF≥15 wk; partial BF<15 wk	BMIFM-BIA or skinfolds	BMI, %FM: NS
Tulldahl [79], 1999, Sweden	Cohort study	781 (88% BF at 1 mo)	165-16 y	FF or BF ≤3 mo vs. BF>3 mo	BMI, wt, %FM DXA, skinfolds	BMI, wt, %FM DXA, skinfolds: NS (borderline trends)
von Kries [87], 1999, Germany	Retrospective	9357 (BF=5335, FF=4022)	5-6 y	Exclusive BF<2, 3-5, 6-12, >12 mo	Overweight> 90th and obese > 97th BMI percentile	Overweight: AOR: 0.79 (0.68-0.93)if BF, obese: AOR: 0.75 (0.57-0.98) if BF
Wadsworth [97], 1999, UK	Retrospective	3731 (BF=2873, FF=858)	6 y	BF≤2, 3-4, 5-10, >10 mo	Overweight> 90th and obese > 97th BMI percentile	Overweight and obese: NS
Hediger [84], 2001, USA	Cross-sectional	2685 (NHANES III)	3-5 y	Ever BF Never BF	"At risk" (85th-94th percentile) of overweight.	AOR = 0.63 (0.41-0.96)
Armstrong [83], 2002, UK	Retrospective	32200 (BF=8751, FF=23449)	39-42 mo	Exclusive BF or FF for 6-8 mo	Obese:≥ 95th and severe obese: ≥98th BMI percentile	AOR for obese =0.72(0.65 -0.79); severe obese =0.70 (0.61-0.8) if BF
Bergmann [98], 2003, Germany	Prospective	480	6 yr	BF vs. FF	Overweight> 90th and obese > 97th BMI percentile	4-5 yr, FF had double prevalence of obesity, and triple at 5-6 yr.

BF= breastfeeding; FF= formula feeding; wt= weight, ht= height, NS: not significant; BMI= body mass index, RR= relative risk; OR= odds ratio; % FM= percent fat mass, BIA= bioelectrical impedance; DX= dual-energy x-ray absorptionmetry

1.2 Maternal health

Ovarian cancer

It has been estimated that the annual incidence of ovarian cancer was 1,948 cases among the total population of 22,750,000 in Taiwan, 2002. Though this is a relatively low incidence rate, it has been rising [99].

To quantify the effects of cumulative months of breastfeeding on the risk of epithelial ovarian cancer, Gwinn et al [100] used data from the Cancer and Steroid Hormone Study--a multi-centre, population-based, case-control study in the US. Detailed reproductive histories were obtained from 436 women aged 20-54 with epithelial ovarian cancer newly diagnosed, and from 3833 women aged 20-54 selected at random from the same geographic areas. The estimated relative risks of epithelial ovarian cancer was 0.6 (95% CI 0.5-0.8) for women who had ever breastfed compared with never breastfed. The WHO Collaborative Study of Neoplasia and Steroid Contraceptives [101] in 7 countries (Australia, Israel, China, Chile, the Philippines, Thailand and Mexico) was a multinational hospital-based case-control study between 1979 and 1988. 393 cases of ovarian cancer were compared to 2565 controls matched on age, hospital, and year of interview. A non-significant reduction in risk with short-term (3-7 mo) lactation compared with no lactation was observed but no further reduction in risk was seen with long-term lactation. The reduction in risk associated with months of lactation was not as great as a reduction also reported with months of pregnancy, which may be a result of lactation being a less effective form of ovulation suppression than pregnancy.

A more recent case-control study to identify risk factors for ovarian cancer has been carried out in Taiwan. The authors recruited 86 cases (age range 20-75 years, median 47) from patients with primary, invasive epithelial ovarian cancer diagnosed between 1993 and 1998 in the Taipei metropolitan area. Controls were 369 women (age range 20-75, median 44) selected from patients who were hospitalized at the same time for treatment of unrelated diseases. Subjects were interviewed in person regarding sociodemographic and reproductive characteristics, family and medical history, and diet. They found that breastfeeding for more than 1 year had insignificant protective effect (OR: 0.55, 95% CI:0.29-1.01). The confidence interval is wide and crosses the line of no effect. Only small number of women had breastfed and the duration of breastfeeding was short; because of this and the relatively small sample size, the test was less powerful and interpretation is difficult [102].

To conclude, using breastfeeding promotion as a means to reduce ovarian cancer has potential effect, but the impact in Taiwan may not be profound.

Breast cancer

It is known that pregnancy and lactation cause significant changes in concentrations of circulating hormones, resulting in systemic metabolic effects as well as structural changes in the breasts which may theoretically reduce the risk of spontaneous neoplastic transformation in breast tissues. However, epidemiological evidence is controversial.

In contrast to levels of incidence prevailing in women in Western countries, Chinese women in Taiwan and China are considered to have the lowest incidence of breast cancer in the world. However, in the past 20 years, breast cancer incidence in Chinese women has seen a dramatic increase of 50-100%, which supports the need for breast cancer prevention and screening programmes. It is also important to note that breast cancer in Chinese women is characterized by younger age at tumour onset [103]. Though less prevalent than Western countries, the impact of breast cancer on both the society and the family is considerable due to early onset of the disease and many of the patients have relatively young children and family duties to fulfil. There are many factors that need to be taken into consideration in establishing a screening programme. Prevention and screening have gained publicity in the last decade in Taiwan, where there is an established screening programme.

The WHO Collaborative Study of Neoplasia and Steroid Contraceptives (different to the study referred to above) [104] was a multinational hospital-based case-control study from 1979 to 1986 in 10 countries (Australia, Germany, Cambodia, Israel, Chile, China, Kenya, Mexico, Philippines, and Thailand), and also assessed the relationship between breastfeeding and risk of breast cancer. It included many women who lactated for long periods of time. Data were collected by personal interviews of 2336 cases who and 14,900 controls. No statistically significant trends in relative risk estimates with duration of lactation were observed. No trends in risk were observed with mean number of months of lactation per child, or with number of pregnancies followed by treatment to suppress lactation. Long-term lactation may reduce slightly the risk of breast cancer, but the evidence for this from this study is not strong.

The primary factor that has complicated study of this issue is the apparent difference in causation of pre- and post-menopausal breast cancers. A retrospective population based study [105] concluded that no association exists between lactating patterns and post-menopausal breast-cancer incidence; however, some other large-scale, population based studies [106-108] found a significant protective effect, continuing the controversy. Most studies (table 1.7) reported a significant protective effect on breastfeeding against pre-menopausal breast cancer [106-115]. A protective effect is shown in these studies, and the effect generally increases with total months of lifetime breastfeeding. Several issues were mentioned in studies [105, 116-119] that reported no significance in the association between breastfeeding and breast cancer i.e. short duration of breastfeeding among the study populations, with little variability to allow adequate biological effect to occur and sample size is not large enough to distinguish pre-menopausal and post-menopausal cases.

A collaborative re-analysis in 2002 [40] included data from 47 epidemiological studies in 30 countries that included information on breastfeeding patterns and other aspects of childbearing. These were collected, checked, and analysed centrally, for 50302 women with invasive breast cancer and 96973 controls. Estimates of the RR for breast cancer associated with breastfeeding in parous women were obtained after stratification by fine divisions of

age, parity, and women's ages when their first child was born, as well as by study and menopausal status. They found that women with breast cancer had, on average, fewer births than did controls (2.2 vs. 2.6). Furthermore, fewer parous women with cancer than parous controls had ever breastfed (71% vs. 79%), and their average lifetime duration of breastfeeding was shorter (9.8 vs. 15.6 months). The relative risk of breast cancer decreased by 4.3% (95% CI 2.9-5.8; $p<0.0001$) for every 12 months of breastfeeding in addition to a decrease of 7.0% (5.0-9.0; $p<0.0001$) for each birth. The size of the decline in the relative risk of breast cancer associated with breastfeeding did not differ significantly for women in developed and developing countries, and did not vary significantly by age, menopausal status, ethnic origin, the number of births a woman had, her age when her first child was born, or any of nine other personal characteristics examined. It is estimated that the cumulative incidence of breast cancer in developed countries would be reduced by more than half, from 6.3 to 2.7 per 100 women by age 70, if women had the average number of births and lifetime duration of breastfeeding that had been prevalent in developing countries until recently. Breastfeeding could account for almost two-thirds of this estimated reduction in breast cancer incidence. The authors concluded that the longer women breastfeed the more they are protected against breast cancer. The lack of or short lifetime duration of breastfeeding typical of women in developed countries makes a major contribution to the high incidence of breast cancer in these countries.

A case-control study in Taipei [120] showed those who had ever breastfed had OR of 0.57 for breast cancer compared with non-breasfeeders in a population of both pre and post-monopausal women. Breast cancer has been the second most common cancer in women in Taiwan since 1995 and the third leading cause of cancer mortality [121]. The breast cancer incidence was 5.94 per 100,000 in 1979 and 23.2 per 100,000 in 2001; and there is an increasing incidence among women age from 35-50 years. If the protective effect of breastfeeding is true, breastfeeding promotion can be a public health intervention to prevent the increasing trend of breast cancer.

Table 1.7: Studies investigating associations between breastfeeding and maternal risk of breast cancer: case-control studies

Author, year	Location, case: control	BF practice	AOR or ARR (95% CI)	Comment
Brinton[109], 1983	US, 1211:1120,	Ever BF yes no	 0.94 (0.78-1.59) 1	BF at younger age had greatest effect. Average duration of BF/ child: 30 weeks. No information about BF duration and adjustment.
Byers [110], 1985	US, 453:1365	Most recent birth BF>12 m 7-11 m 1-6 m < 1 m 0 Lifetime duration 0 PP per 6 mo RR per 12 mo	 0.21 0.63 0.57 0.98 1 (p for trend = 0.07) 1 0.78 0.60 (p for trend < 0.01)	ARR for pre-menopausal women only. Association NS for post-menopausal women. Cases more likely to report lactation failure due to insufficient milk. CI not reported. Adjusted for age, age at menarche, age at first live birth, year of education, stop BF due to insufficient milk.
Rosero-Bixby [118], 1987	Costa Rica, 171: 826,	Lifetime duration	No effect	Split age groups at 45 years.
Layde [116],1989	US, 4599:4536	BF> 24 m FF	No effect	NS for either pre- or post-menopausal groups. Small sample size.
Siskin[122], 1989	Australia, 459:1091	Any BF (yes vs. no)	No effect	All breast fed for a total duration less than 2 years
Yoo[123], 1992	Japan, 521:521	Any BF No BF BF ≥13 m 10-12 m 7-9 m 4-6 m 1-3 m 0	0.62 (0.37-1.04) 1 Combined* population 0.53 (0.26-1.05) 0.59 (0.34-1.02) 0.47 (0.24-0.92) 0.75 (0.41-1.38) 0.71 (0.40-1.26) 1 (p for trend <0.05)	Trend of protection is not significant for post-menopausal women. Adjusted for family history, age of menarche, parity, and age at first pregnancy. *: Combined pre and post-menopausal population.

Table 1.7 *(continued)*: Studies investigating associations between breastfeeding and maternal risk of breast cancer: case-control studies

Author, year	Location, case: control	BF practice	AOR or ARR (95% CI)	Comment
Yoo [123], 1992 *(continued)*			Pre-menopausal	
		BF ≥13 m	0.77 (0.23-2.54)	
		10-12 m	0.58 (0.27-1.25)	
		7-9 m	0.39 (0.15-0.97)	
		4-6 m	0.63 (0.27-0.44)	
		1-3 m	0.85 (0.39-1.83)	
		0	1 (p for trend < 0.001)	
Newcomb [124], 1994	US, 5878:8213	BF > 24 mo	0.78 (0.66-0.91)	ARR (CI) for breast cancer for pre-menopausal women only. Telephone interviews. Separate effect for age at 1st lactation. Younger at 1st lactation was associated with reduced risk (p for trend = 0.003). Association not significant for post-menopausal and combined population. Controlled for age at menarche, birth of first child, parity, family history of breast cancer, benign breast disease, BMI.
		No BF	1 (p < 0.05)	
		BF >24 m	0.72 (0.51-0.99)	
		13-24 m	0.66 (0.50-0.87)	
		4-12 m	0.79 (0.63-0.97)	
		<3 m	0.85 (0.69-1.06)	
		0	1 (p for trend < 0.001)	
		Fist preg at < 20y and BF>6 mo	0.54 (0.36-0.82)	
		No BF	1	
Romieu [113], 1996	Mexico, 349, 1005		Pre-menopausal	Mean age of first BF 21 years. Duration of BF for first birth made most impact. BF associated with risk of breast cancer for both pre- and post-menopausal women. Adjusted for age, socio-economic status, family history of breast cancer, age at first live birth and parity. Provide subjects with prolonged lactation.
		Ever BF	0.58(0.30-1.11)	
		Never BF	1	
			Post-menopausal	
		Ever BF	0.43 (0.20-0.92)	
		Never BF	1	

Table 1.7 *(continued)*: Studies investigating associations between breastfeeding and maternal risk of breast cancer: case-control studies

Author, year	Location, case: control	BF practice	AOR or ARR (95% CI)	Comment
Romieu [113], 1996 *(continued)*		BF > 60 m	Pre-menopausal	
		37-60 m	0.40 (0.14-1.13)	
		25-36 m	0.39 (0.14-1.06)	
		13-24 m	0.96 (0.41-2.25)	
		4-12 m	0.40 (0.17-0.92)	
		1-3 m	0.79 (0.38-1.56)	
		no	0.40 (0.15-1.05)	
			0.7 (p for trend < 0.001)	
			Post-menopausal	
		BF > 60 m	0.27 (0.11-0.64)	
		37-60 m	0.29 (0.12-0.68)	
		25-36 m	0.54 (0.22-1.32)	
		13-24 m	0.59 (0.25-1.41)	
		4-12 m	0.46 (0.19-1.11)	
		1-3 m	0.65 (0.20-2.05)	
		no	1.0 (p for trend < 0.001)	
Negri [117], 1996	Italy, 2167: 2208	Any BF vs. no BF	No effect	Parity significantly related to lactation. 60.9% cases, 68.5% controls were post-menopausal.
		BF 0->6 m	No effect	
Wu [125], 1996	US, 492: 764	Any BF vs. no BF	No effect	Matched on age, ethnicity (Asia American) and area of residence.
Yang[120], 1997	Taiwan, 244: 450		Combined	Adjusted for age, age at first birth, use of oral contraceptives and family history. Hospital based controls. Age of subjects ranged from 20-90 y.
		Ever BF vs. Never	0.57 (0.38-0.85) vs. 1	
			Pre-menopausal	
		Ever BF vs. Never	0.56 (0.32-0.99) vs. 1	
			Post-menopausal	
		Ever BF vs. Never	0.48 (0.24-0.98) vs. 1	

Table 1.7 *(continued)*: Studies investigating associations between breastfeeding on maternal risk and breast cancer: case-control studies

Author, year	Location, case: control	BF practice	AOR or ARR (95% CI)	Comment
Newcomb [107], 1999	US, 3633: 3790	BF≥24 mo BF ≥2 wk Never BF	0.73 (0.56-0.94) p for trend = 0.10 0.87 (0.78-0.94) 1	ARR (CI) of breast cancer for only parous, post-menopausal women. Age at first lactation was not consistently associated with risk. Modest inverse associations appeared to persist even up to 50 years since first lactation. Controlled for age, birth of first child, parity, and family history.
Marcus[112], 1999	US, 862:790	1st BF < 20 y/o BF<1 y BF≥1 y Never	0.2 (0.1-0.6) 0.3 (0.1-1.0) 0.1 (0.0-0.8) 1	Only significant for pre-menopausal women who breastfed before age of 20 y. Study of teenage pregnancy. Adjusted for age at diagnosis, family history, and race.
Furberg [111]1999	US, 751: 742	Ever vs. never BF	0.7 (0.5-0.9)	ARR for women aged 50-74 y. NS for 20-49 y. adjusted for reproductive history, lifestyle characteristics and family history.
Zheng [115], 2000	China (less industrialised community), 404: 404	BF >24 m (per child) 1-6 m (per child) <u>Duration of BF</u> <u>pre-mp*</u> BF ≥109 m 73-108 m 37-72 m 1-36 0 (p for trend = 0.04) <u>Post-mp*</u> BF ≥109 m 73-108 m 37-72 m 1-36 0 (p for trend = 0.01)	0.46 (0.27-0.78) 1 (p=0.02) 0.27 (0.04-1.74) 0.15 (0.03-0.77) 0.72 (0.35-1.50) 1.00 0.84 (0.41-1.56) 0.30 (0.12-0.75) 0.74 (0.32-1.76) 0.26 (0.68-2.33) 1.00 0.92 (0.34-2.43)	In-person interviews. Significant protection for both pre- and post-menopausal women with prolonged (>73m) lactation. *mp = menopausal. Adjusted for age, age at menarche, age at first full-term pregnancy, parity, BMI, residence and family history. Subjects with prolonged lactation.

Table 1.7 *(continued)*: Studies investigating associations between breastfeeding and maternal risk of breast cancer: case-control studies

Author, year	Location, case: control	BF practice	AOR or ARR (95% CI)	Comment
Gao[106], 2000	China 1459:1556	BF≥24 mo Ever BF vs. Never	NS NS	NS after adjusting for age, education, family history, age at first birth, age at menarche, age at menopause, physical activity and waist / hip ratio.
Tryggvadottir [108], 2001	Iceland 8021:9729	Increasing duration of BF (+ 6mo, age of Dx.) <40 y 40-55 y >50 y 26-90y Ever vs. never BF <40 y 40-55 y >50 y 26-90y	AOR (CI) p-value 0.77 (0.59-1.00) 0.052 0.51 (0.20-1.30) 0.215 0.32 (0.15-0.66) 0.103 0.33 (0.19-0.56) 0.024 0.09 (0.02-0.45) 0.003 0.51 (0.20-1.30) 0.157 0.32 (0.15-0.66) 0.002 0.33 (0.19-0.56) <0.001	Adjusted for age at menarche, age at first birth, parity, oral contraceptive use, wt and ht. In women had lactate for ≥ 5wk in compare with never BF, BF for ≥ 105 wk had AOR of 0.48 (95% CI: 0.31-0.74) for breast cancer (p=0.001). Dx = diagnosis.
Tessaro[126], 2003	Brazil 250:1020	Ever BF No Yes Duration of BF Never <6 mo 7-12 mo 13-24 mo >25 mo	AOR (CI) 1 0.8 (0.8-1.2) 1 1.0 (0.6-1.8) 0.9(0.4-1.8) 0.8(0.4-1.6) 1.0(0.6-1.9)	Adjusted for skin colour, schooling, age at menarche, age at first birth, parity, oral contraceptive use, family history, abortion, benign breast diseases.

Table 1.7 *(continued)*: Studies investigating associations between breastfeeding and maternal risk of breast cancer: case-control studies

Author, year	Location, case: control	BF practice	AOR or ARR (95% CI)	Comment
Ursin [127], 2004	US 4567:4668	35-49 yr	AOR (CI)	Adjusted for age at menarche, age at first full term birth, parity, oral contraceptive use, family history, education, race.
		Ever vs. never BF	0.7(0.6-0.82)	
		Never BF	1	
		< 2 wk	0.7(0.48-1.05)	
		>2 wk	0.7(0.6-0.82)	
		Total duration (mo)		
		Never	1	
		<1	0.7(0.52-0.94)	
		1-6	0.75(0.62-0.9)	
		7-23	0.67(0.54-0.82)	
		24+	0.63(0.48-0.83)	
		50-64 yr		
		Ever vs. never BF	0.9(0.79-1.03)	
		Never BF	1	
		< 2 wk	1.12(0.82-1.52)	
		>2 wk	0.88(0.77-1.0)	
		Total duration (mo)		
		Never	1	
		<1	0.97(0.77-1.21)	
		1- 6	0.86(0.73-1.01)	
		7-23	0.91(0.76-1.01)	
		24+	0.69(0.69-1.20)	

1.3 Summary

Studies looking at the relationships of the quantity and duration of breastfeeding for both women's and children's health outcomes are many. The older studies tend to be less robust in study design. Most were observational studies, given the fact that it is almost impossible and/or not ethical to either randomly allocate women to breastfeed / not to breastfeed, or to blind the assessors when measuring the outcomes. One more recent study employed clustered-randomisation of hospitals allocating hospitals to different intervention arms. This has minimised potential bias. In most of the observational studies control for confounders was inadequate or lacking.

As mentioned earlier, there is a lack of evidence conducted in either Chinese societies or Taiwan specifically on the effects of breastfeeding and relevant health outcomes. The studies reviewed in the chapter were mainly conducted in Western countries and the transferability of the observed effects is subject to debate.

The sharp decline of breastfeeding with nearly universal formula feeding in Taiwan between the 70's to the 90's (see later chapter) could partly explain the rapid increase of some childhood illness (e.g. asthma and atopic dermatitis) and even perhaps health problems in early adulthood (e.g. overweight and obesity) or even later in life (e.g. breast cancer).

In short, though there is not much evidence directly from studies conducted locally, the indirect evidence showed that breastfeeding could be used as a public health intervention to improve the nation's well-being. Since the breastfeeding prevalence has been quite low (see later chapter), a small increase could bring substantial benefit at the community level.

2. Changes of breastfeeding patterns

2.1 Overview of breastfeeding patterns in the 1990s

There have been dramatic changes in how infants were fed during the 20th century. Almost universal at first, breastfeeding declined until mid century in industrialised countries, after which it once again gradually increased. Until recent years, the health benefits of breastfeeding were not emphasized, and synthetic formulations i.e. breast milk substitutes were popular. Only of late have health professionals become involved in the promotion of breastfeeding as a return of traditional values and the "natural"' versus the "artificial" 'way to feed infants. The 20th century also witnessed unprecedented cultural, social and technological changes, involving the role of women, their income, education, and childbirth practice.

During the 1990s, modest improvements were made in exclusive breastfeeding during the first four months of life, with prevalence increasing from 48% to 52% in the developing world ([128]. Timely complementary feeding (at 6 to 9 months) has also improved, with levels increasing from 43% to 49% globally between 1990 and 2000. The proportion of infants still breastfeeding at one and two years of age increased only slightly. In general the greatest improvements occurred in Latin America and the Caribbean, where the breastfeeding indicators showed substantial increases [128].

Globally, exclusive breastfeeding rates at 3 months are highest in East Asia and the Pacific (57%) and lowest in the Central and East Europe region (17%). Despite overall improvements during the 1990s, fewer than half of all infants are now exclusively breast-fed for four months, and only about half receive complementary foods in a timely manner. Although global levels of continued breastfeeding are relatively high at one year of age (79%), only around half are breastfeeding at two years of age. Thus, current breastfeeding patterns are still far from the recommended levels [129]. However, Taiwan still ranks among the lowest on breastfeeding indicators.

2.2 Breastfeeding patterns in Chinese speaking populations

In this section, I describe the breastfeeding patterns in countries and areas mainly populated by Chinese speaking peoples (China, Hong Kong, Singapore and Taiwan). The geographic locations are shown in the map in fig 2.2.

Breastfeeding in China

Breastfeeding served as an effective means of birth spacing in traditional Chinese society where the reproductive potential was enormous owing to early and nearly universal marriage. In modern times, breastfeeding still provides protection against malnutrition and infectious diseases that is crucial for child survival, particularly in rural areas with poor access to modern medical facilities and infant formulas are not available.

It is worth bearing in mind that all discussions about infant health care in China should be prefaced with an awareness of the one-child policy and its implication on infant health care. This policy introduced in the mid-1970s is a national one and is strongly enforced. Each

couple is only permitted to have one child, except for a few rare instances and in very remote areas. There is great emphasis among people on the birth of "one perfect child", and this has resulted in wide spread prenatal and fetal monitoring, in urban areas at least. With such attention to the "one perfect child", breastfeeding is an important public health issue.

Though there is no direct evidence available, it is believed that breastfeeding was universal and lengthy in China historically, and this may also true in less developed areas at the beginning of the 21st century. A survey with national coverage done in 1930s [130] showed a 100% breastfeeding initiation rate and 50% of those were still breastfeeding one year postpartum, and 5% of the infants were fed by wet nurse at the age of one year. However, the type of breastfeeding was not defined and the method of sampling, number of subjects and background were not reported. However, China has begun to experience a rapid decline in breastfeeding in urban and suburban areas and there is a concern that this may spread to rural areas. According to a national survey conducted between 1983 and1986 in 20 provinces with nearly 90,000 infants[131], the average breastfeeding prevalence (exclusivity not defined) for less than 6 months was 48.8% in urban areas and 75.1% in rural areas. The mixed-feeding prevalence was 36.2% in urban areas and 23.1% in rural areas at 4 months.

Table 2.1: Infant feeding patterns in 20 provinces between 1986 and 1986, China [131]

Feeding method	Percentage (%)		
	Urban	Rural	Total
Breast feeding*	48.8	75.1	58.6
Mixed feeding	36.2	23.1	31.3
Bottle feeding	15.0	1.8	10.1

* Duration and exclusivity not defined.

In Chengdu, a big city in Shichuan, a cross-sectional survey including infants aged 0-5 years in 1983 [132] showed that breastfeeding prevalence in those six months and under was only 16.3% whereas bottle-feeding prevalence had risen to 56.7%. In rural areas, breastfeeding was the main feeding method, and bottle-feeding prevalence was only 1.8%.

Table 2.2: The feeding patterns of infants under 6 months old in Chengdu [132]

Age (month-old)	Breastfeeding* (N / %)	Mixed feeding (%) (N / %)	Bottle-feeding (%) (N / %)
Birth	70 / 29.8	96 / 40.8	69 / 29.4
1	98 / 21.5	127 /27.8	231 / 50.7
2	86 / 19.4	105 / 23.6	253 / 57.0
3	81 / 15.3	141 / 26.6	308 /58.1
4	84 / 14.6	150 / 26.0	342 / 59.4
5	46 / 9.7	120 / 25.3	309 / 65.0
6	42 / 10.5	103 / 25.9	253 / 63.6
Total	507 / 16.3	842 / 27.0	1765 / 56.7

* exclusivity not defined.

A survey of 2,278 infants in Beijing in 1982 [131] revealed that 22% of infants at 4 months in the city and 61.5% in the surrounding rural areas were breast-fed. In contrast, a retrospective study of infant feeding practice in Beijing [133]showed that in the 1950s, the breastfeeding prevalence (exclusivity not defined) in the city was 81% and 95% for the rural areas. This

reveals that there has been approximately a 40% decline in breastfeeding prevalence in Beijing and its surrounding areas in the previous 30 years. And of course, the decline of breastfeeding prevalence was accompanied by a rise of mixed and bottle-feeding prevalence.

Table 2.3: Breastfeeding prevalence* (%) in Beijing area [131]

Time	Urban	Rural	Mean
1950s	81	95	88.0
1980s	22	61.5	41.8

* Duration and exclusivity not defined

A community-based survey in urban China reported the hurdles preventing women from breastfeeding, which were: 1) Delayed initiation of breastfeeding after delivery due to mother - infant separation in hospitals. 2) Mother's early return to work with workplaces often far from home. 3) Mother's belief of insufficient milk or breast milk not being nutritious enough for infants. 4) Easy access of either modified cow's milk or infant formulas[134]. Moreover, a Chinese official document reported the factors in the rural areas making breastfeeding more possible because of : 1) Shortage or absence of infant formulas in many villages. 2) Mothers being relatively young and good in health. 3) Working places often close to home [135].

A renaissance of breastfeeding in the Chinese Mainland has occurred during the 1990s as a result of a government policy that required wide implantation of the WHO Code and the Ten Steps of BFHI from 1992 (see section 4.4). The official document reported the prevalence of exclusive breastfeeding at 4 months showed an increase from 30% to 64% from 1990 to 1994 [135]. According to my personal communication with the Chinese officials, in Chinese hospitals, all staff, from cleaners to administrators, are required to undergo training in breastfeeding promotion and "all resources are mobilized to protect, promote, and support breastfeeding"[136]. While this increase is certainly dramatic, it is worth recalling that the considerable majority of the Chinese population live in rural areas, where compliance with official policy is much greater.

Breastfeeding in Hong Kong

Over recent decades, rapid economic growth and urbanisation has brought about large changes in infant feeding practice in Hong Kong. The prevalence of "ever breastfeeding" (women who ever breastfed during the time from delivery to interview) in Hong Kong were 44% in 1967, but fell to 5% by 1978 [137]. The Baby Friendly Hospital Initiative Hong Kong Association (BFHIHKA) notes that the "ever breastfeeding" (women who ever breastfed from the time of delivery to the interview) increased from 19% in 1992 to 41% in 1997 in the participating hospitals [138]. Although these results show an encouraging upward trend, the breastfeeding prevalence in Hong Kong is still low compared to other industrialised areas. Data collected by BHFIHKA in 1998 showed only 15% of mothers from the baby friendly hospitals were still providing any breast milk to their babies 8 weeks postpartum[139]. Data collected from 1995 to 1997 showed that only 12% of Hong Kong mothers gave their infants any breast milk at 3 months of age (4% exclusively breast milk and 8% partial) and these were the lowest prevalence among 17 countries quoted in the report [140]

Breastfeeding in Singapore

In Singaporean Chinese, a dramatic fall in the prevalence of breastfeeding and its duration, measured in community surveys, has been shown to be much stronger among the poor than the well-to-do in table 2.4 [141-144].

Table 2.4: Breastfeeding patterns in poor and well-to-do Chinese-Singaporean mothers [141-144].

Year	Poor (%)			Well-to-do (%)		
	Birth	1 mo	3 mo	Birth	1 mo	3 mo
1951	85	80	40	90	85	80
1971	30	<10	5	50	45	5
1985	26	--	--	57	--	--

Note: poor and well-to-do not defined

In the whole nation, poor mothers continue to less likely to breastfeed than well-to-do mothers. Breastfeeding among well-to-do mothers reached its bottom nadir in the 1970s and gradually climbed till the 1990s; this upward trend did not happen in the poor mothers. Table 2.5 shows selected results from these studies. There is no direct explanation why there was such a low breastfeeding prevalence (28%) at birth among well-to-do mothers in 1971 and a great increase in only 5 years.

Table 2.5: Breastfeeding patterns in Singapore since 1955 in all ethnic groups.

Year	Poor (%)		Well-to-do (%)	
	Birth	>1 mo	Birth	>1 mo
1951	90	85	90	80
1960	70	65	73	30
1971	51	43	28	10
1976	50	--	64	--
1978	49	41	68	29
1985	36	--	60	39

Note: poor and well-to-do not defined

The Breastfeeding Mothers' Support Group's (BMSG) did a small survey [142] in 1996 in 120 women attending public talks and workshops conducted by this group. Out of 120, 63 questionnaires were returned. No demographic characteristics were reported. They found that 67% breastfed for less than 2 months, 22% between 2 and 5, and 11% more than 6 months. The type of breastfeeding was not defined.

Although the sample sizes are small in this and other local studies and there are questions of biased selection of the respondents, there are recurring themes in the factors affecting the prevalence of breastfeeding in Singapore. The well-to-do breastfeed more than the poor, Chinese breastfeed less than other ethnic groups and more educated mothers breastfeed more than less educated ones. The breastfeeding patterns in Singapore are not unique; indeed, similar changes have been observed in industrialised countries in the West. They demonstrate just how "fragile" breastfeeding patterns can be. Changing life styles and attitudes, especially women's work patterns and family structure seem to have been associated with a dramatic decline in breastfeeding, especially during periods of strong economic growth. Studying the

breastfeeding patterns within different communities in Singapore provides a good source of information for understanding Chinese women's infant feeding pattern. Unlike in China, Chinese women in Singapore live in a democratic society and have been exposed to Western influences. In other predominantly As table 2.6 shows, Malays in Singapore favoured breastfeeding most, the Chinese were least enthusiastic and there is a significant ethnic difference which cannot be attributed to physiological characteristics (e.g. weight, type of delivery, milk output), health measures or general environment conditions such as family incomes. Rather, it appears to reflect cultural differences in reacting to modern trends towards bottle-feeding. This also highlights the question of why Chinese in particular are more influenced by these modern trends and behaviour patterns. The answer is probably very complicated and cultural in origin. This is also confirmed by other studies showing that Chinese immigrants are less likely to breastfeed and the prevalence of breastfeeding is lower than the specific Singapore national average [145, 146]. One should note that in other Chinese areas like Taiwan and Hong Kong with similar process of industrialisation, little ethnic variation makes comparative investigations within different ethnic groups difficult.

Table 2.6: Percentages of mothers in three ethnic groups initiate and continue to breastfeed for 1 month or more [142]

Year	Chinese (%)		Malay (%)		Indians (%)	
	Birth	>1 mo	Birth	>1 mo	Birth	> 1mo
1951	90	75	--	--	95	91
1961	65	49	63	44	82	53
1975	58	--	93	--	--	--
1978	42	20	100	73	81	62
1985	41	13	78	20	73	44
1992	61	--	89	--	85	--

Breastfeeding in Taiwan

A survey conducted in Taipei and Kaoshung in 1967 showed that 93% of women ever breast-fed during the first 3 months postpartum, and the mean breastfeeding duration (of predominant breastfeeding and mixed-feeding) was 13.6 months [147]. By the 1970's, [148] the prevalence of "ever breast feeding" fell to 50% at 3 months postpartum and the mean duration (predominate breastfeeding and mixed-feeding) decreased to 4.4 months in Tainan and Kaoshung. In 1989, a survey [149] in Taipei, Kaoshung and Taichung cities found the predominant breastfeeding prevalence was 5.4% 1 month postpartum and the mixed-feeding prevalence was 21.2%. Unfortunately, the methodological details of these surveys, including the sampling methods and justification of the sample size, were not reported.

In a more recent community-based survey using convenient sampling (n=236) in 1996 [150] the predominant breastfeeding prevalence was still 5.0% at 1 month after delivery and 35.9% of babies had ever received some breast milk at 3 months. In 2002, another community-based, convincement sampling survey (n=534) [151] in Taipei, Taichung and Kaoshung reported that the prevalence of predominant breastfeeding at discharge was 9.6%; with 37.5% mixed-feeding (giving some breast milk) their babies. The prevalence of mixed feeding dropped to 6.8% and 35.4% at the first month postpartum. At the third month postpartum, the prevalence of mixed feeding was 30.2% and that of predominant breastfeeding was 5.8% (see fig. 2.1.).

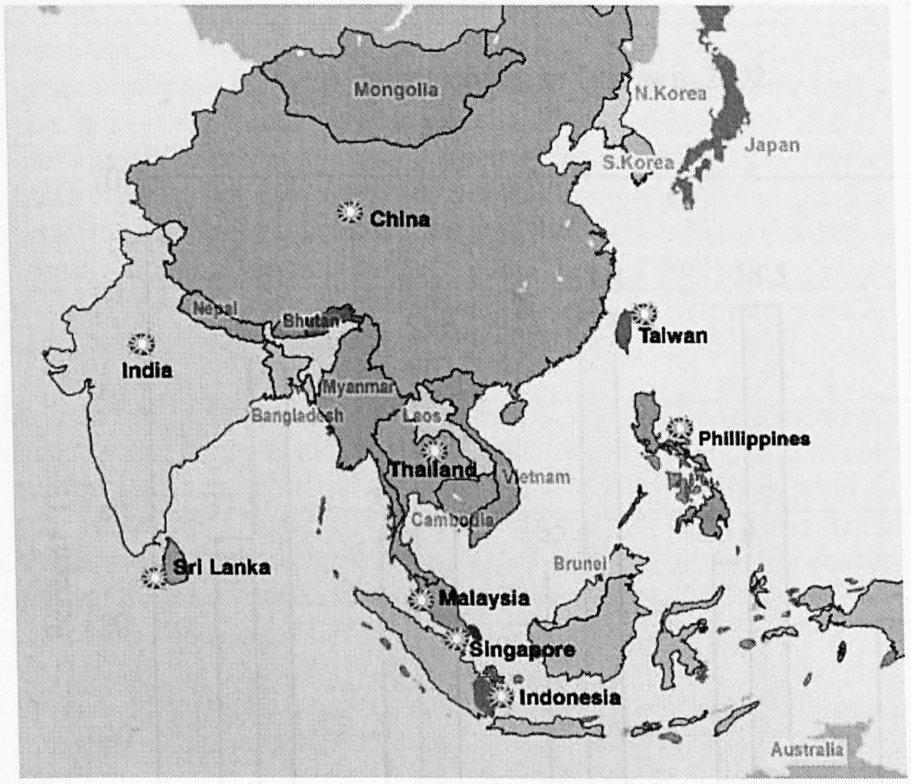
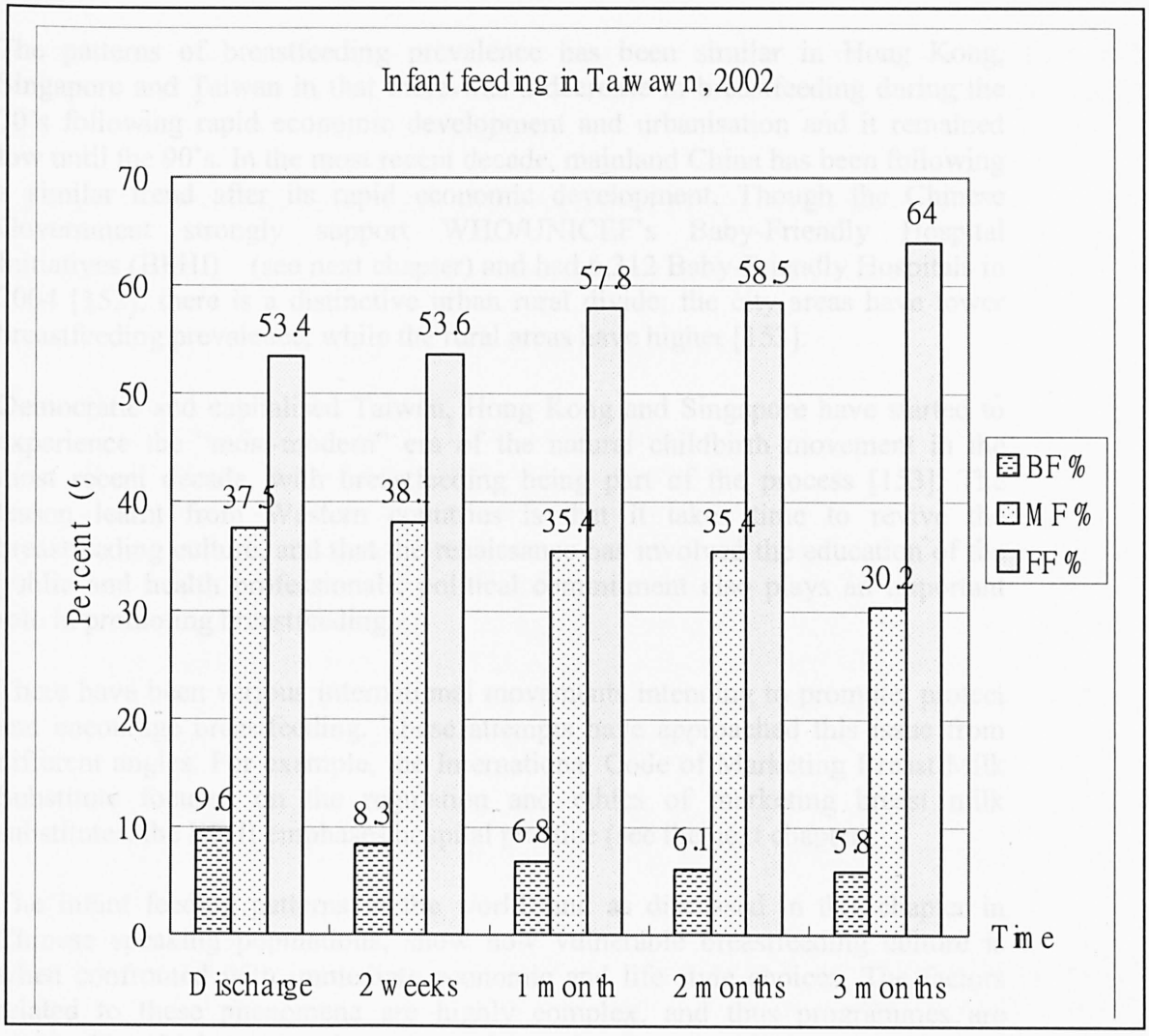


Fig 2: Map of East and south East Asia

Fig: 2.1 Infant feeding methods in Taiwan, 2002 [151].



Note: BF: breastfeeding, MF: mixed-feeding, FF: formula feeding.

2.3 Summary and overview:

The patterns of breastfeeding prevalence has been similar in Hong Kong, Singapore and Taiwan in that there was a decrease in breastfeeding during the 70's following rapid economic development and urbanisation and it remained low until the 90's. In the most recent decade, mainland China has been following a similar trend after its rapid economic development. Though the Chinese Government strongly support WHO/UNICEF's Baby-Friendly Hospital Initiatives (BFHI) (see next chapter) and had 6,312 Baby-Friendly Hospitals in 2004 [152], there is a distinctive urban rural divide; the city areas have lower breastfeeding prevalence, while the rural areas have higher [153].

Democratic and capitalised Taiwan, Hong Kong and Singapore have started to experience the "most-modern" era of the natural childbirth movement in the most recent decade, with breastfeeding being part of the process [153]. The lesson learnt from Western countries is that it takes time to revive the breastfeeding culture, and that the renaissance has involved the education of the public and health professionals, political commitment also plays an important role in promoting breastfeeding.

There have been various international movements intending to promote, protect and encourage breastfeeding. These attempts have approached this issue from different angles. For example, the International Code of Marketing Breast Milk Substitute focused on the regulation and ethics of marketing breast milk substitutes, the BFHI emphases hospital practice (see the next chapter).

The infant feeding patterns in the world, and as discussed in this chapter in Chinese speaking populations, show how vulnerable breastfeeding culture is when confronted with immediate economic and life style choices. The factors related to these phenomena are highly complex, and thus programmes are required in which various elements work together.

3. International agreements

A number of international agreements have been made, mainly during the later part of the 20th century, with the underlying aim of strengthening and supporting breastfeeding at a time when it was seen to be under increasing threat.

3.1 The WHO International Code of Marketing of Breast Milk Substitutes

The aim of WHO International Code of Marketing of 1981 [154] states that there should be:

- No advertising of breast milk substitutes to the public
- No free samples to the mothers
- No promotion of products in health care facilities
- No company "mother-craft" nurses to advise mothers
- No gifts or personal samples to health workers
- No pictures idealising artificial feeding, including pictures of infants on the products
- Information to health workers should be scientific and factual
- All information on artificial feeding including labels, should explain the benefits of breastfeeding; and the costs and hazards associated with artificial feeding
- All products should be of a high quality and take into account the climate and storage conditions of the countries where they are used

A 2001 survey in 191 countries showed that 24 countries had implemented most of the Code. In 1991, only 9 countries had taken measures to legislate, most on only some aspects of the Code [155].

The state of affairs in relation to the Code in Taiwan, which never formally adopted the Code in its full specification is poor, and in respect to the requirements of the Code the infant formula market is unregulated. The violation of the Code at community and hospital levels is widespread (see later chapters) with financial incentives from formula companies and a general lack of awareness being important factors that hinder implementation.

3.2 The Innocenti Declaration

This document [156], a result of a joint WHO/UNICEF meeting in Florence, Italy in 1990, stresses the need for reinforcement of a "breastfeeding culture". It requires commitment and advocacy for social mobilisation from acknowledged leaders of society. The document states that all governments by the year of 1995 should have:

- Appointed a national breastfeeding coordinator of appropriate authority, and established a multi-sectional national breastfeeding committee composed of representatives from relevant departments, NGOs, and health professional associations
- Ensured that every facility providing maternity services fully practices all the " Ten Steps to Successful Breastfeeding" set out in the joint WHO/UNICEF statement " Protecting, promoting and supporting breastfeeding: the special role of maternity services" (see below)

- Taken action to give effect to the principles and aim of all articles of the International Code of Marketing of Breast Milk Substitutes and consequent relevant World Health Assembly resolutions in their entirety
- Enacted imaginative legislation protecting the breastfeeding right of working women and established means for its enforcement

This document also calls upon international organizations to:

- Draw up action strategies for protecting, promoting and supporting breastfeeding, including global monitoring and evaluation of their strategies.
- Encourage and support national authorities in planning, implanting, monitoring and evaluating their breastfeeding policy.

Taiwan not being a member of the United Nations and WHO, did not respond to the Innoceti Declaration for a long while. The first documented action by the Taiwanese Government to take up the Declaration was to adopt the "Ten Steps" with considerable modifications that lowered the standards, in 2001 (see later chapter). Even after several years of working on the local versions of BFHI, there is no appointed national coordinator or national breastfeeding authority to date.

3.3 WHO/UNICEF: Ten Steps to Successful Breastfeeding

"Protecting, promoting and supporting breastfeeding: the special role of maternity services: A joint WHO/UNICEF statement" [157, 158] was published in 1989. This document is especially geared towards health care services and presents "Ten Steps to Successful Breastfeeding" Every facility provides services and care for maternity and newborn infants should:

1. Have a written breastfeeding policy that is routinely communicated to all health care staff.
2. Train all health care staff in skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding within half an hour of birth.
5. Show mothers how to breastfeed, and how to maintain lactation even if they should be separated from their infants.
6. Give newborn infants no food or drink other than breast milk, unless medically indicated.
7. Practise rooming-in - that is, allow mothers and infants to remain together - 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.

The document also contains suggestions for action, which include recommendations concerning the role of health care staff, care of newborn and discharge procedures. It concludes with the statement that in "every country, the competent authorities should

implement the health and social measures required to protect, promote and support breastfeeding. They should ensure that the most appropriate choice with regard to infant feeding is made within families, and that the health system supports this decision in every way."

The acceptability and implementation of the 10 steps in Taiwan will be discussed in a later chapter. In brief, the hospitals / clinics applying the Taiwanese version of BFHI did best in step 8 and 9, and worst in steps 3 and 1. This performance has to be interpreted in the context that the assessment criteria have been considerably modified against the global standard, and the fact that the assessment process as well as the credibility of the assessors are inadequate (see the later chapter).

3.4 The Baby-Friendly Hospital Initiative (BFHI)

Based on the belief that much can be achieved by ensuring full support of breastfeeding in the health facilities where women give birth, WHO/UNICEF further promoted the Ten Steps to Successful Breastfeeding by launching the Baby-Friendly Hospital Initiative in 1992. This includes an assessment for a maternity care facility to be classified as certified as "Baby-Friendly" by following procedure:

1. The facility makes a self-assessment based on the 10 steps.

2. A formal request is sent to the BFH National Committee or WHO in Geneva.

3. An evaluation team, consisting of at least one certified BFHI assessor assisted by local and regional staff, is sent. They evaluate using an accepted, standardized procedure.

4. The team recommend whether to certify, or not, the maternity facility for a limited period.

Taiwan adopted the BFHI model and localised it according to the local administration and politics, the procedures of the Taiwan version will be discussed in the next chapter.

Table 3.1 and 3.2 show some international statistics on progress of the baby friendly hospitals initiative

Table 3.1: World-wide coverage of Baby-Friendly Hospitals in 2002[152].

Area	No. of Baby-Friendly Hospitals
West and Mid Africa	1354
East and South Africa	587
America and Caribbean	1353
East Asia and Pacific Islands	8747
South Asia	1645
Mid east and North Africa	811
CEE/ CIS	233
Industrialised countries	262
Total	14994

Table 3.2: Percentages of the coverage of Baby-Friendly Hospitals in selected countries [152].

Country	No. of Baby-Friendly Hospitals	% of total Hospitals
Sweden	64	97
Norway	35	58
Denmark	8	15
Switzerland	21	11
Germany	10	1
South Korea	11	7
Japan	17	--
Thailand	787	87
Malaysia	281	87
Philippine	1047	58
China	6312	47
Fiji	3	11
Mongolia	93	26
North Korea	2	0.5

3.5 The International Labour Organisation (ILO) Maternity Protection Convention

To combine successful breastfeeding and working, women need support in the workplace. The International Labour Organisation (ILO) established "The Maternity Protection Convention" in 1919. In June 2000, the governing body of the ILO revised the Convention and the major recommendations were [159].

- The introduction of maternity leave of no less than 14 weeks
- Cash benefits not less than two-thirds of the women's previous earnings
- A woman shall be provided with the right to one or more daily breaks or a daily reduction of hours to breastfeed her child
- The period during which nursing breaks or the reduction of daily hours of works are allowed, their number, duration of daily hours of work shall be determined by national law and practice. These breaks or reduction of daily hours of work shall be counted as working time remunerated accordingly.

Comments on the Maternity Protection Convention:

Longer maternity leave, flexible working hours, part time work and workplace breastfeeding breaks either to return home to breastfeed, breastfeed in the crèche, have the child brought to the work place, or facilitating breast milk expression at work, all seem to be effective

practices for the protection of breastfeeding in the workplace[160, 161] . Specific workplace arrangements (facilities for breastfeeding breaks, such as a private accessible room with comfortable chair, hand washing facilities, fridge, power point and electric pump to express, or facilities to store breast milk, paid time during working day and or longer maternity leave) are associated with longer duration of breastfeeding among working mothers[162, 163]. Employers and workers can identify, through questionnaires and interviews, problems, protective factors and strategies for improving breastfeeding in the workplace, as well as potential workplace hazards for pregnant and breastfeeding women (e.g. army service women, policewomen, workers in the biological and chemical industries) [162, 164, 165].

Evidence also shows that support to working mothers through counselling on how to maintain lactation while working is effective. Clinical follow up, distribution of information kits and support in the workplace, increase breastfeeding duration and prevalence[166, 167]. Expression of breast milk seems to be the most effective intervention to maintain lactation among working mothers [162-164, 168].

Women in Taiwan are entitled to eight weeks maternity leave by the Labour Standards Law, which is one of the shortest among industrialised countries[169]. Despite the passage of the Gender Equality in Employment Law a few years ago, there are still a lot of shortfalls in enforcing the law. Despite the low fertility rate, employers are not supportive to their pregnant or postpartum employees in general. My personal experience of a job interview for working in a hospital may reflect the reality. The interviewers asked me if I planned to get pregnant in the coming 3 years, arrangement and stating that clinical work is demanding. The background fact is that there it is not possible under current administrative arrangements to arrange colleagues to cover each other's leave for longer than 2 months. My personal experience is not unique; one of my oncologist colleagues said "my director told me at the first day of my work that I am only allowed to get pregnant after being promoted to the visiting staff (equivalent to Consultant in the UK system)!"[170]. In meetings of activists' groups that I attended in the course of this work, it appeared these considerations have made most of the women's right activists not supportive of breastfeeding, or has even led them against it, since they feel it hinders efforts for women's equality in the work-place. The argument is that there is a lack of protection of women's right to work, and women of childbearing age are particularly vulnerable to being refused work. There is vacuum when it comes to supporting women wishing to breastfeed in the working place. This came out strongly in the qualitative study. It has made some critics query whether Taiwanese society is yet ready to "make our women breastfeed" [171].

3.6 Critique and Evidence underlying the BFHI

Factors influencing women's decisions and behaviour with respect to breastfeeding are many (see later). The "Ten Steps for the Successful Breastfeeding" address one major factor contributing to the erosion of breastfeeding, health care practices that interfere with breastfeeding. Until these improve, attempts to promote breastfeeding outside the health service will be impeded. Although inappropriate aspects of maternity care cannot be held solely responsible for low breastfeeding prevalence, appropriate care may be prerequisite for raising them. The steps cover maternity practices necessary to support breastfeeding. After

the first implementation of "10 steps to successful breastfeeding", WHO published "The Evidence for the Ten Steps for Successful Breastfeeding" [172] which reviewed the evidence for efficacy and provided a tool for advocacy and education. However, factors associated with women's decision on breastfeeding vary so much in different settings that this review was led to address the point that the implementation of "Ten Steps" affects breastfeeding differently in different countries.

The Promotion of Breastfeeding Intervention Trial (PROBIT) [4] is a cluster-randomised trial with one-year follow-up, and is the first randomised trial of the BFHI. With a cluster randomised trial, where the clusters are randomised to receive a BFHI initiative and not allocation to type of feeding, the feasibility and ethical problems above are avoided. The large number of mother-infant pairs studied provides an opportunity to assess the direct relationship between a breastfeeding promotion intervention and infant health [3]. It included 31 maternity hospitals and polyclinics in the Republic of Belarus and recruited 17,046 full-term singleton infants weighing at least 2500 g with healthy mothers. 96.7% completed the entire 12 months of follow-up. Sites were randomly assigned to receive an experimental intervention (n = 16) modelled on the BFHI or standard practice (n = 15). Infants from the intervention sites were significantly more likely to be breastfed to any degree at 12 months (19.7% vs. 11.4%; adjusted OR, 0.47; 95% CI, 0.32-0.69), and more likely to be exclusively breastfed at 3 months (43.3% vs. 6.4%; p<0. 001) and at 6 months (7.9% vs. 0.6%; p =0. 01). During one year follow-up, they had a significant reduction in the risk of one or more gastrointestinal tract infections (9.1% vs. 13.2%; adjusted OR, 0.60; 95% CI, 0.40-0.91) and of atopic eczema (3.3% vs. 6.3%; adjusted OR, 0.54; 95% CI, 0.31-0.95), but showed no significant reduction in respiratory tract infection (intervention group, 39.2%; control group, 39.4%; adjusted OR, 0.87; 95% CI, 0.59-1.28). These results provide a solid scientific underpinning not only for BFHI, but also for future interventions to promote breastfeeding in both developing and developed countries.

Summary

There have been strong international movements to promote and protect breastfeeding. Most of these initiatives are institution-base, top-down approaches which are relatively expensive implement and require financial and/ or political commitment. In Taiwan, there is also a need for more attention to work-place and related problems. It would be reasonable to assume that no single intervention works, and combination of those would perform better and more effective.

4. Health service and breastfeeding in Taiwan

4.1 Background to introduction of the local breastfeeding promotion programme

The Baby-Friendly Hospital Initiative, as the complete WHO/UNICEF recommended initiative, was not initially adopted by the Taiwan government. With Taiwan not being a United Nations member, there was no initial impetus to adopt it. Furthermore, breastfeeding had been left out of policy for decades. One example is that a leaflet of infant nutrition containing parental advice produced by the Department of Health in Taiwan in 1998 showed the detailed procedures of making up a bottle feed and breastfeeding was not mentioned at all.

Moreover, there was almost no research about breastfeeding in Taiwan until the last 5 years, so there is a lack of information about women's perspectives on breastfeeding, and I can present the local situation based only on the limited information available.

The history of introducing BFHI to Taiwan is incomplete[44]; what was firstly documented is the Bureau of Public Health carried out a pilot in local hospitals in Taipei, to test the " Ten Steps" and develop modifications that were thought to be more acceptable to local settings, in 1998. The Department of Health in Taiwan launched a nation-wide programme in 2001, using the model tested out in Taipei. Fifty-six hospitals participated and 38 (67.9%) were accredited as baby-friendly hospitals. This programme requires all accredited hospitals to re-apply every year as the accreditation expires in one year.

The programme recruited assessors by inviting established experts in relevant areas, with those willing to participate automatically validated, without training or assessing their credits before the hospital assessments. Therefore the programme was heavily criticised for inconsistency between different assessors, and also for the credibility and validation of the assessors. Consequently, two 18-hour trainings based on UNICEF's 18-hr training of breastfeeding management (designed for health professionals in primary care) were held in Taipei and Kaoshung in early 2003. Fifty-six participants who successfully completed this 18-hour training were recognised as valid assessors. The annual full-scale assessment was cancelled in mid 2003 due to the SARS epidemic from spring to early summer. In place of it a mentoring process very similar to the assessment was carried out from September to November, 2003. Accredited assessors were taken as qualified mentors. The differences from UNICEF assessment are there is no success/failure of this mentoring process, and instead of three, two assessors were assigned to each hospital. All hospitals accredited in 2002 were invited to the mentoring programme. Those that did not have baby-friendly accreditation before 2002, went through a full assessment procedure during September to November, 2003.

The most recent assessment was carried out during September to November 2004 by repeating the procedures which are described in detail later in this section.

Background of the health care system and maternity care in Taiwan

The Gross National Product (GNP) *per capita* in Taiwan was $25,300 USD in 2004 [173], the

total GNP being the 18th, and *per capita* GNP 25th in the world . In 1999, Taiwan was the largest computer component manufacturing country in the world [174] . The total population is about 23 million and the capital (Taipei) has about 2.9 million population. The estate price in the big cities especially in Taipei is fairly high due to high population density, as a result, about 1/3 -1/2 of newly married couples live with their parents (predominantly with the man's family) before they can afford to buy their own houses [175].

In Taiwan, both public and private hospitals are paid via the National Health Insurance if specific interventions are indicated, and the fee for patients is the same irrespective of the kind of hospital they go to.

In 2004, there were 583 hospitals and clinics involved in maternity care and there were 227,336 births in that year. In the same year, 90 (15..4%) of these were part of the local breastfeeding promotion programme covering 45.1% of total births [176]. The majority (97.8%) of Taiwanese citizens participate in National Health Insurance by paying monthly fees according to their annual income and age. Nearly all of the health services related to pregnancy and childbirth are free, with few exceptions (e.g. epidural and Caesarean Section (CS) without medical indication) [177]. The national average CS rate was 35.4% in 2004 and total fertility rate (TFR) was 1.26 nationally and lower (1.08) in Taipei. [177]. The National Health Insurance covers a 3-day hospital stay for vaginal birth and 5 days after CS. Most women take their full entitlement of hospital stay and rapid discharge is very rare after childbirth. Maternity care is very obstetrician–led and only 23 independent midwives are registered with their local Department of Health; moreover, only 4 of them had the experience of "catching the baby" and the nation has had totally 9 planned home births in the past 5 years [177].

4.2 The local baby-friendly hospital programme

All institutions were invited to join the local breastfeeding promotion programme. Ninety hospitals had applied by 31st July 2004. There were 48 district hospitals (53.3%), 19 teaching hospitals (21.1%), 18 local hospitals (20.0%) and 5 clinics (5.6%).

Assessment procedure

The assessment standard was based on WHO/UNICEF's 10 steps of successful breastfeeding (listed previously), with considerable modifications to match local policy. In general, the local standards are much looser than the international criteria, and the qualification of assessors is much less demanding.

The hospitals gave their preferred dates and time of being assessed, and the confirmed assessment time and details of assessors were given weeks or even months before the assessment. The total designated assessment time is about 2.5-3 hours; and a team of 3 assessors carry out one assessment in the morning, and another after lunch. In comparison with the international standard, for 2-3 days, 2.5-3 hours in each, this is very unlikely to lead to good understanding of the hospital's practice. The hospitals needed to report breastfeeding prevalence up to 2 months after discharge in the previous half-year and there is no internal or external audit of how they do this.

Result

For 90 hospitals which applied for assessment, 77 (85.6%) passed with 6 failures and seven did not complete the assessment process. Forty-one (53.2%) are district hospitals, 19 (24.7%) teaching hospitals, 13(16.9%) local hospitals and 4 (5.1%) clinics.

Prevalence of breastfeeding

Table 4.1: Reported breastfeeding prevalence of Hospitals participating in local baby-friendly programme (n=90) in 2004 [176].

	Mean % (± SD)	Range (%)
Breastfeeding* at discharge	41.9 (± 24.8)	41.8-42.1
Mixed feeding at discharge	51.2 (± 23.3)	51.151.4
Breastfeeding at 1 month postpartum	34.6(± 14.3)	34.5-34.7
Mixed feeding at 1 month postpartum	42.7 (± 12.1)	42.6-42.7
Breastfeeding* at 2 month postpartum	25.1 (± 10.7)	25.0-25.1
Mixed feeding at 2 month postpartum	33.4 (± 10.3)	33.3-33.5

* Breastfeeding in the table represents hospital self-reported exclusive breastfeeding

The reported breastfeeding prevalence has shown a steady increase in each year. In 2001, the reported breastfeeding prevalence at discharge was 25.6%±22.9%, and mixed feeding prevalence at discharge was 54.3%±24.4%. After 1 month, the reported breastfeeding prevalence was 24.0%±13.9%, mixed feeding prevalence was 41.9%±35.8%. However, in a community survey [154] in June to August 2001, a period covering the time of assessment, 2236 (63% of the mothers interviewed) delivered in Baby-Friendly Hospitals. Two hundred and eighty (12%) reported having breastfed and 794 (34%) having mix-fed their babies at discharge. Not surprisingly, this surveys also demonstrated different breastfeeding prevalence in comparison with hospital self-reported ones (see later section).

These findings highlight one of the problems of the programme. There was no audit of the method used to define the reported breastfeeding prevalence, and breastfeeding was defined differently in different hospitals, so the reliability of the reported prevalence is doubtful (e.g. exclusive breastfeeding can include juice, glucose water or occasional formula feeds). Moreover, the quality of care was not reinforced, for example, the officer dealing with this programme said "I receive e-mails from mothers giving birth in our baby-friendly hospitals saying they still got formula supplementation despite their decision to breastfeed, and also free formula supply at discharge" [44]. One assessor said "After the assessment, one doctor who got full marks on his test paper asked me: Do you think breastfeeding is really better? The company representatives have been complaining to me!!"[178]

The performance of the Ten steps

As mentioned in the earlier chapter, step 8 (encourage demand feeding) had the best performance score, followed by step 9 (no pacifiers, or dummies). The implementation of step 8 (encourage breastfeeding on demand) requires proper implementation of step 7

(rooming-in) which ranked 7 out of 10. This together with the results with the qualitative and quantitative of this current study makes one doubt the validity of this assessment. The results from the survey showed that only 4.8% of women said they had 24-hr room-in, and 40.7% had daytime rooming-in (see later chapter). Moreover, one of the emerging themes from the qualitative results also revealed that mother baby separation was quite common. It is unlikely to feed on demand if most of the mothers are not with their children. This highlighted the problem of the local assessment.

Table 4.2: The performance scores for the 10 steps (N=90).

Step	Full score	Average	Range	SD	Percentage [1]	Rank
1	12	8.8	5.3-10.0	1.1	73.0	9
2	10	8.8	6.0-10.0	1.0	87.9	7
3	10	6.4	3.1-7.0	0.8	63.9	10
4	12	10.3	3.0-12.0	1.7	85.5	8
5	13	12.1	6.9-13.0	1.1	92.8	5
6	7	6.7	2.9-7.0	0.7	95.4	3
7	15	13.7	5.4-15.0	1.9	91.1	6
8	10	9.7	6.5-10.0	0.6	97.4	1
9	4	3.9	1.7-4.3	0.4	97.0	2
10	7	6.5	3.7-7.5	0.7	93.3	4
Total	100	91.0	66.3-99.8	5.9	--	--

[1]: Percentage: (Mean/Full score)x100

Summary

Overall, the programme was introduced quickly and the assessment was done very soon after, without full documentation of its quality. From the international perspective, there is no doubt that proper implementation of BFHI requires longer for the programme to settle in and attain more acceptance; there is also a need for more understanding of how it operates, how it has impacted on all levels of hospital staff and hospital practice, and of how its effects will be accepted by the women giving birth.

4.3 Infant formula market in Taiwan

There are 121 products registered as "breast milk substitutes suitable for infants from 0-6 months" available and Taiwanese mothers probably have the largest choice of infant formula in the world [179]. Lin [180] investigated the infant formula market in Taiwan. He found that doctors' suggestions were the key determinant of choice of brand and parents tended to choose the same brand as given before discharge because of the belief, taught by health professionals, that change to another may create diarrhoea and gut intolerance. Because of the declining birth rate, the formula companies have had to create more age groups and produce more "novel" formulas (e.g. "humanization of milk") to keep the customers. Moreover, a product called "follow-on milk has been used as a device of the formula companies in Taiwan. They have been accused of packing it identically to ordinary formula – which usually follow the WHO code – and, since it is post-breast-feeding product this associates ordinary formula

with being acceptable in mothers' perceptions

The companies use local pharmacists as a major channel of advertising and distributing and contact expectant mothers or mothers with young children in clinics and hospitals, holding antenatal education programmes, and giving free vouchers or gifts by free flyers in magazines. The author discussed the absence of moral and ethical issues in this market suggesting it was because of strong competition and vast profit. The companies aim to persuade the public that infant formula has every good property that is in breast milk, and even does "better" when breast milk is no longer "suitable" for babies i.e. at the age above 4 months. They portray bottle-fed babies as "smart", "knowledgeable" (e.g. wearing a graduation gown), "happy" and "healthy". The advertisements also imply that mothers may produce "poor milk" but modern technology "never fails". This contributes strongly to explaining why many bottle-feeding mothers believe that infant formula is better for babies.

4.4 State of the International Code of Marketing Breast Milk Substitutes

Although the Code was adopted in the World Health Assembly in 1981, the Taiwan policy is one of voluntary compliance, which means violations are rampant. Taiwan only has legislation on food safety and labelling but no specific legislation to implement the Code.

Companies claim they follow the Code, but do so according to their own interpretation. Many consider only infant formula for less than 6 months as covered by the Code and that the Code is for developing countries. Taiwan, according to them, is a "developed" country [181].

Though it is required by the local breast feeding promotion programme that the hospitals have to purchase infant formula and cannot have connection with the formula companies, compliance with this is superficial. Not being willing to cut the connections with the formula companies is one of the reasons for some hospitals not participating this programme. Moreover, as shown in the qualitative study (see later), formula companies still contact women after discharge and it has been found that people working in the local government responsible for birth registration sell the details of newborn infants to the companies. Similarly, some health professionals working in rural hospitals sell the contact details of women to the companies [182].

4.5 Knowledge and attitudes about breastfeeding of health professionals in Taiwan

Internationally, since many health professionals appear to have insufficient knowledge and clinical practice skills concerning breastfeeding at graduation, efforts have been made to develop and implement competency-based in-service training. These have been evaluated in several studies and summarized in a systematic review[183]. In-service training using the UNICEF / WHO 18-hour course on breastfeeding management appears to be effective. In Belarus, this course was used to train the participant in the PROBIT trial; a large cluster randomised trial, and showed a positive effect of a breastfeeding promotion programme modelled on the BFHI.

In Taiwan, a preliminary survey in 2004 [184]showed that 64.2% of schools training health professionals (medical, nursing and nutrition) had breastfeeding in their curriculum (the total number of schools surveyed was not reported), and the courses are very much focused on

mechanisms and problem solving. Nursing departments with the longest teaching hours are most likely to include breastfeeding in their curriculum. These authors also surveyed 170 hospitals and 71.2% stated they have breastfeeding in-service training regularly. Among those, 72.3% said they hold in-service training annually. It has been reported that the number one problem of in-service training is lack of funding, and no appropriate lecturer. Lack of teaching material is also a concern [185].

In-service education of health professionals has been launched in Taiwan in parallel to the local breastfeeding promotion programme. Nursing staff are the most enthusiastic of all, but there is a lack of local expertise and appropriate teaching materials. In recent years, some schools started to add breastfeeding as part of the curriculum, with the departments of nursing being the most enthusiastic. Lack of appropriate teaching materials and teachers knowledgeable in lactation, plus breastfeeding being not considered important are common reasons and barriers to inclusion of breastfeeding in the curriculum [185].

Chen et al [186] did a survey of 20 paediatricians, 11 obstetricians, 108 nurses, 105 medical students and 126 student nurses in VGH-Taichung, a teaching hospital which has been aggressively promoting breastfeeding for a decade in central Taiwan. They reported the mean knowledge score (based on a questionnaire of 73 questions covering the topics as shown in the table below) of the 139 staff member was 49.4 ± 10.8 (the highest possible score was 73); that of the medical students was 31.2 ± 8.9, and that of the nurse students was 39.5 ± 7.6.

Table 4.3: Knowledge score by topics (% correct) [186].

	No of questions	Health professionals	Students
Lactation mechanism	19	76.3	52.6
Benefits to mothers	13	75.5	62.3
Breast problem	14	56.9	42.5
Infant problems	11	69.8	46.5
Contra-indications	6	70.8	42.0
Nutrition	5	48.2	34.0
Benefits to infants	5	72.4	60.2
Total	73	67.7	49.0

Eighteen out of 73 questions were not answered correctly by more than 60% of the respondents. These were about mechanisms of lactation, contraindications of breastfeeding and jaundice management. As high as 85% considered hepatitis B as a contra-indication of breastfeeding and this may have huge impact since Taiwan has high prevalence of hepatitis B. Only 30.2% of them knew about let-down and rooting-reflex and their roles of initiating lactation. More than half (56.4%) did not know that supplementary feeding impedes breastfeeding and only 20.4% understood that frequent feeding helps to clear hyperbilirubinaemia. Interestingly, 85% considered that sore nipples and breast engorgement are inevitable and 74.8% of them thought Taiwanese women have smaller breasts, making insufficient milk "universal". Being female, a nurse, receiving in-service education, older age (> 30 y), and being breastfed during infancy were positively correlated to knowledge score and breastfeeding attitudes. Generally, all respondents reported positive attitudes (measured by asking their general attitudes of breastfeeding in an un-validated questionnaire) towards

breastfeeding. Although 90.4% of them answered that a bottle should not be given before lactation is established, half of them disapproved of exclusive breastfeeding when the milk supply is not yet established and babies are crying.

Table 4.4: Knowledge scores by characteristics [186].

Variables	Mean value	Standard Deviation	P value
Gender			
Male	33.5	12.4	<0.001
Female	44.2	10.8	
Occupation			
Physician	51.0	12.2	<0.001
Nurse	48.9	10.4	
Medical student	31.2	8.9	
Student nurse	39.5	7.6	
In-service education			
Yes	51.9	9.3	<0.001
No	39.5	11.2	
Age (years)			
≤30	39.8	11.3	<0.001
31-35	48.6	11.0	
≥36	51.5	10.1	
Breastfed during infancy			
Yes	43.7	11.8	<0.001
No	38.8	10.8	
Parenting experience			
Yes	48.4	10.8	<0.001
No	40.1	11.5	

Table 4.5: Attitude scores and related variables [186]

Variables	Mean value	Standard Deviation	P value
Gender			
Male	4.8	0.6	<0.001
Female	5.0	0.6	
Occupation			
Physician	5.0	0.7	<0.001
Nurse	5.2	0.5	
Medical student	4.8	0.5	
Student nurse	4.9	0.6	
In-service education			
Yes	5.1	0.6	0.002
No	4.9	0.6	
Age (years)			
≤30	4.9	0.6	<0.001
31-35	5.1	0.5	
≥36	5.3	0.5	
Breastfed during infancy			
Yes	5.0	0.6	<0.001
No	4.8	0.5	
Parenting experience			
Yes	5.2	0.6	0.001
No	4.9	0.6	

Importantly, some of the questions on the physiology of lactation tie well with interventions such as "rooming-in", "skin-to-skin contact", "avoid teats or dummies" and "avoid supplementary feeds" and were correctly answered by less than 30% of the respondents. Also breast problems were not well understood. For example, many doctors and nurses still see

thrush and mastitis as absolute contraindications of breastfeeding[187]. This survey suggested that occupation and being breastfed during infancy were the most significant correlates of breastfeeding knowledge. In-service training improved knowledge but not attitude (except marginally). In comparison with WHO's recommendation (all health professionals to have at least 18 hours training per year), for nurses only to receive an 8-hour in-service training in this famous "pro-breastfeeding" hospital is inadequate. The number of physicians surveyed was very few; obstetricians have more opportunities to provide breastfeeding information to mothers than paediatricians, but the small sample size makes it impossible to compare obstetricians and paediatricians. Most importantly, this survey provided information only about knowledge and reported attitude; it is difficult to ascertain their practice.

A more recent study in 2004 [188] showed that 873 out of 1152 who attended a training of six one-day seminars and responded to the questionnaire, performed worst in answering questions related to counselling compared to questions on other breastfeeding related topics. Also health professionals from the north where Taipei is situated, and those working in large hospitals had higher knowledge scores (p value not reported). And the authors concluded that there is a need to include counselling skills when designing breastfeeding education programmes.

Summary

As described earlier, hospitals in Taiwan have financial incentives as well as the need for the publicity that comes from being certified as "Baby-Friendly". The local version of assessment has lowered the global standards so that the government can mass produce "Baby-Friendly Hospitals". Since the assessment is conducted annually, hospitals that passed previously can be very offended if they fail later. Therefore, representatives from hospitals who are generally also assessors, lobby strongly if they think they cannot achieve the standard. For example, the 2004 standard for assessing step 7 (room-in) stated that at least 50% of women staying in the hospital at the day of assessment have to have 8-hour room-in, and at least 10% have to have 24-hr room-in. These low percentages are products of lobbying because proper implementation of room-in has been difficult, and therefore, some of the assessors insisted on lowering the standard so that it is "achievable".

In general, health professionals' knowledge and attitudes of breastfeeding have not been extensively studied in Taiwan. The existing studies lack methodological rigour and the interpretation of their findings is difficult. However, there seems to be a consensus that the current education focuses too much in the knowledge and mechanism of breastfeeding, and the counselling and problem resolving components are lacking.

The current breastfeeding programme in Taiwan has been very much health sector oriented, and it is difficult to get the real impact on the increase of breastfeeding. While the local politicians and people involved in the Taiwan version of BFHI say that this initiative has a major role in the increase of breastfeeding in Taiwan in the recent 5 years, there are flaws behind this argument. One is that the breastfeeding prevalence is self-reported by the hospitals with no audit, and the definition of breastfeeding was defined differently in different hospitals, even by different assessors. Moreover, as the assessment is only an half-day exercise and hospitals can choose the date to be assessed, it is quite easy to "fake" and the

assessment may not cover real practice. Furthermore, there can be a secular trend that with economic development and increased education, women in Taiwan would naturally increase their breastfeeding, and the local programme is a product more than a cause of this. As revealed in the current study, we found an increase in breastfeeding in the period after discharge, and from women's narratives, some of the hospital practices actually interfered with breastfeeding (see later).

There is a knowledge gap of women's perspectives of breastfeeding in the Taiwanese society, and there is a need to address this gap. The next chapter focuses on the women's perspective.

5. Social and personal factors in breastfeeding

There are three main sections in this chapter. In sections 5.1 to 5.3, I described the Chinese tradition in relation to breastfeeding. Sections 5.4-5.5 contain information on the women's perspective and on the influential factors affecting their infant feeding behaviour. Since there are not many studies conducted in Chinese speaking countries, I had to use information from studies done among Chinese immigrants. Overseas Chinese have different characteristics to those who stayed in their motherlands, and these findings may not be totally transferable. They are nevertheless sources of information and provide useful insight of this topic. It is worth noting that some Chinese mentality and perceptions, perhaps deeply rooted in culture, are quite persistent and consistent throughout time and geography, and this may give some justification of looking at information from Chinese people in different societies. The last section 5.6 is about the determinants of infant feeding behaviours. The evidence was drawn from international studies where information from Chinese societies is more clearly lacking.

5.1. Chinese tradition and breastfeeding

Historically, Chinese culture views breast milk as "food from a pure source "and was aware of benefits such as anti-infective properties. Among twenty-four Chinese Filial Duties, one involved the son risking his life to get fresh deer's colostrum to heal his old parents' eyes. A famous Chinese story tells that on her deathbed, an old lady blessed her dutiful daughter-in-law who had kept her alive for several years with her daily dose of breast milk as "health food".

The relatively low breastfeeding prevalence current in urbanized Chinese society is slightly unexpected in view of these cultural characteristics. Because of the collectivist nature of Chinese society [189] childbirth still remains an event for the whole family network. Relatives especially the older generations that have mostly been breastfed usually come around and give advice to the young mothers.

5.2 Chinese traditional postpartum practice

Traditional Chinese custom has stipulated for thousands of years that a woman should be confined to home for one full month of convalescence after giving birth, which is described earlier. During this she is expected to adhere to a set of restrictive prescriptions collectively referred to as "doing the month" or "sitting a month". They include refraining from washing and minimising contact with water (particularly cold water) and wind, following the rubric for a "hot diet to remedy pregnancy-induced hot-cold (*yin-yang*) imbalance" [190], and observing taboos that restrict physical activity. The most commonly cited anthropological literature is by Pillsbury in 1978 in Taiwan [191]. "Doing the month" facilitates physical recovery of the mother, prevents chronic illness, and also strengthens intra-family relationships. It serves as a physical convalescence, a preventative measure, a social sanction to rest, a consolation, and a prompt for women to concentrate on their baby and their role in breast-feeding. Strengthening intra-family ties applies especially to the woman and her

mother or mother-in-law. The practice has many implications for breastfeeding and a direct bearing upon the psychosocial well-being of women postnatally and in their future life.

Breastfeeding as an extension of reproductive activities

A newborn child is the result of a series of reproductive behaviours, and breastfeeding behaviour is an extension of reproduction. One cannot understand breastfeeding behaviour alone without tracing backwards to women's other reproductive and sexual beliefs and behaviours. The theoretical model shown below was derived from Chu's study [192] regarding the menstrual beliefs and practices of Chinese women in Taiwan. It proposed that reproductive behaviour is shaped by three classifications of belief.

Beliefs about the nature of pregnancy and puerperium of Chinese women

Puerperium is a period when Chinese women are being pampered and rewarded. The formal term *"Tso yeuh tzu"* (to sit or to do the month) refers to this period. For a whole month, the mother is relieved of most domestic duties so that she can recuperate. She can rest in bed as much as she likes and others serve her special foods.

Most informants commented that they feel very special during this time because they receive much attention and care. Puerperium is a time to relax, to enjoy special treatment and attention, and most important of all, to recuperate from pregnancy and birth, and perhaps become even healthier than before this pregnancy. Because puerperium is regarded as the most vulnerable period for a woman she must observe many behavioural regulations to guard her health.

It is also a common belief that a puerperal woman is expected to look better than usual. She is expected to gain some weight and look more rounded (*feng-man*) and with a better and healthier colour in her face after all the nourishing diets she has had. Because she has stayed indoors for a month, her skin becomes fairer and paler, a sign of beauty in Chinese society.

The puerperium is regarded as such an important periods in a woman's life that she cannot risk not observing traditional rules and practice. The whole ranges of *"tso yeuh tzu"* practices have been widely accepted as important and valuable traditional knowledge for women to learn. However, since many of the regulations are considered as "inconvenient" or "unscientific" (e.g. do not drink water, do not take a shower or bath and do not read books or watch TV...) to the younger generation the acceptance of each practice varies. There are often conflicts or tension between generations during this period regarding certain rules imposed on women. It is not uncommon that older women superimpose the regulation over the puerperal women according to their own particular knowledge and interpretation of the practice.

Beliefs about health and illness causation

There are several types of causation of illness, such as by germs or by disturbance of bodily order according to Chinese traditional medicine. These are related to this study and are now discussed.

Disturbance of bodily order

This type of illness is seen as originating from within one's body. It is based on the assumption that one becomes ill when something disturbs the regular functioning of the body and alters the internal order leading to a state of imbalance. Factors like change of climate, unbalanced diet, emotional stress, inadequate rest and undue physical exercise are all considered to upset bodily order. In Chinese society, this sort of imbalance is deeply linked with the *"Yin-Yang"* theory.

The *"Yin-Yang"* theory

Yin and *yang* are the most fundamental concepts in Chinese thought. The principle developed inCchina as the 6th century [193], is regarded as the basis of the entire universe and every created things. The term *yin* and *yang* first appeared in the *His-Tz'u* to the *I Ching* [194]. *Yin* was the north side, which is also the rear and the shadowed side of the mountain, yang the southern side, on which the sun shone. The two terms since developed into a very broad set of meanings and can be related both concretely and abstractly to many aspects of Chinese culture.

They are two components of the universe that are constantly in opposition and at the same time, complement each other and make up the whole oneness. As long as *yin* and *yang* are balanced, the universe is in order.

At the personal level, if yin and yang are in balance, one will be in good health; however, if the energy is displaced, in either direction, one becomes ill. If *yin* dominates *yang*, one may feel cold, weak, pale, lack of spirit and energy and may break out in cold sweat or dizziness. If *yang* dominates *yin*, one may feel hot, feverish, thirsty, restless, quick tempered, and may suffer from insomnia or sore throat [194].

Lay persons who are not acquainted with the formal philosophical terms from classical literature, often call the symptoms "*yin* over *yang*" (cold) or " *yang* over *yin*" (hot). As Anderson's study [195] indicated, food therapy is the most common form of health seeking behaviour in the context and can be seen against this background.

The *Yin Yang* principle of puerperium

During puerperium a woman's body is considered as extremely *yin* and weakened. Moreover, because of intrapartum bleeding and the amount blood lost, it is considered in a far more serious and imbalanced condition than that during menstruation. Therefore, in order to restore bodily balance and regain health, it is very important to observe behavioural and dietary rules. For a month after giving birth, a woman must be confined to secure complete rest, and avoid coming in contact with more yin, i.e. cold water and wind. During this month, she needs to stay in bed most of the time, wear warm and long sleeved clothing, and avoid any physical exertion including all household duties. Most important of all, she must observe a special diet.

Besides avoiding food of a *yin* nature, similar to those avoided in menstruation, she needs to

strengthen her body and replenish her blood by eating special foods and taking particular remedies. The herbs or food eaten for this purpose are all of *yang* nature. Most of them, *tang-kuei* chicken, *yi-mu t'sao*, red dates, sesame oil chicken, pork liver, red vinegar with brown (red) sugar and pig knuckles, and the special herbal preparation *shen-hua tang,* are taken to dissolve blood clots, replenish the blood and energy and provide warmth. The herb *tang-kuei* (Ligusticum acutilobum) in particular, is well known in Chinese medicine for its effects as a uterine stimulant, in breaking blood clots and stimulating the production of new blood. It is an essential ingredient of most herbal prescriptions for any blood related illness.

The month after giving birth is considered to be a period in which she must take proper care of herself or she will suffer from long-term health consequences such as headache, anaemia, arthritis, back pain or asthma. Moreover, it is the whole family's responsibility to take care of her, to prepare appropriate foods for her, and to free her from all domestic chores. In modern society, some women perceive that taking care of the newborn, including feeding is a tiring business, and better to avoid during the confinement. Older women, generally the mother-in-law or the mother, take the role of instructing her and helping her in observing the proper conduct during confinement. The importance of this institutionalised practice in Chinese culture is revealed by the formal term of *"tso yueh tzu"*.

"Tso yueh tzu" also has a social dimension. Traditionally, it is a period for the husband's family to show how much they care about their daughter-in-law, and very importantly, it is time to exhibit their wealth by giving the puerperal woman lots of good foods and relieve her completely from physical activity. When the baby is one month old, according to tradition, the family holds a party inviting the extended family and the neighbouring community to participate. It is not only time to celebrate a new life, also a chance to show how the woman is "well-fed" and "well-treated" during the first month after birth.

In this current study, I found a strong adverse relationship between the influences of women's mothers-in-law and breastfeeding. The results from this study also indicate that women who lived with their husbands' family had more difficulties in initiating and continuing breastfeeding. These are consistent with the complex social constraints aforementioned.

"Tso yueh tzu" is a traditional set of tightly integrated rules and practices embedded in Chinese culture. The general puerperium principles, especially related to dietary and behavioural rules, are very similar between China and Taiwan [196], and American Chinese [197].

5.3 Ancient Chinese medical writing on breastfeeding and breast milk

Chinese writings seem to be closer in orientation to modern worldwide medical advice, approaching breastfeeding from a more natural and supportive perspective than Western writings. Historically, Western medical advice on breastfeeding often implies the inadequacy of the mother to nourish, especially in the early weeks of life. Western medicine seems more managerial with regard to breastfeeding than Chinese medicine, and has perhaps "medicalised" breastfeeding, a complaint often voiced [198].

- **Origins of human milk**

  The ancient Chinese medical texts address the origins of human milk. A work by Sun Simiao (581-628) of the Tang Dynasty entitled "essential prescriptions worth a thousand, for urgent need" described human milk as the product of vital energies [199]. Moreover, the following excerpt from an earlier work which was incorporated into an 18th century text expands upon the traditional Chinese physicians' concept of the origin of milk from blood and its appropriateness for infant nutrition[200]. This quote indicates the concept of continuity of infant development from fetal life in the uterus to neonatal life and its dependence upon milk. It also expresses the concept that the "blood" that had previously nourished the uterus via the "highway tracts" was now shifted to the production of milk. This is both an anatomic and philosophic transfer.

  When the child is in the womb,
  the highway tracts move blood to raise it.
  When it is born,
  the highway tracts carry blood in order to feed it milk.
  Milk is blood transformed,
  therefore the child's stomach
  only with this milk does it correspond,
  other foods are thus not at all appropriate.

- **Initiation of breastfeeding**

  12th century Chinese writing sounds remarkably similar to the advice we would give now to a mother who had just delivered a baby [201]. The writers believed if a child is being fed by the mother's milk, what she does "naturally" is not thought to require further elaboration. What was thought as "natural" for the biological mother is made clear by contrast with the writings that describe how to hire and instruct a selected wet-nurse. Moreover, it was never recommended in the Chinese literature that initiation of breastfeeding should be delayed or colostrum was harmful, inadequate, and inappropriate for the newborn.

  A child is born and one feeds milk to it one's self,
  all of this is not discussed.

  But if a wet-nurse is required
  ……

- **Selection of a wet nurse**

The Chinese writings look for signs and behaviours in a wet-nurse that might identify specific diseases that could harm the baby, such as rushes, lumps, nutritional condition, and emotional stability [202].

The employer is expected to pay the wet nurse two months' wages in advance when she is engaged, and he agrees to pay a bonus of an extra a month's wages after the child is weaned. She is expected to serve a probationary period of three days to a week in the home. After her nursing duties are completed in the one family, she may taken on as a servant, she may seek for further employment as a wet-nurse, or she may return to her own home. It is considered desirable that the wet-nurse should have certain qualities. She should be young, healthy, of pleasant disposition, and if possible of pleasing appearance. A primparous woman is preferred. Her breast development should be ample, and attention is paid to the areola of the nipples, which should be black, as an indication of recent delivery of the nurse's own infant. It is recognised that milk must be white and thick.

- **Benefits of breast milk**

Ancient Chinese physicians strongly advocated breast milk as the best source of nutrition for the infants. Throughout 2,000 years, writers expressed concern that substitutes for human milk were being used too early and too often. Wang Dulun, in 1622, stressed the importance of adequate early nutrition for the infant through breast milk, which would assure "strength" and " fullness" for its whole life. [203]Moreover, Zeng Shirong, the 13th century physician, puts the point poignantly: [203]

If breastfeeding misses the time, the child without illness weakens on its own.
If food is unregulated, the child without disease becomes timid on its own.
Milk strengthens tissues and flesh.
Food makes substantial intestines and stomach.
As it is said: " breastfeeding and other feeding for two or three years, then the body will benefit."
People today do not use it.
Take away milk,
a month of unregulated fatty and sweet food,
how could it not result in disease and harm,
result in profound sigh?

- **Practical management advice** [203]

Chinese medical advice paid considerable attention to the practical issues of how to nurse an infant.

For all breastfeeding of a child,
first the hot chi (of the breast) should be dissipated very gently,
do not let the juice gush out;
if the child is made to choke, then withdraw the breast,

let it (regain) normal breathing;
after (normal) breathing, again breastfeed it.
In this manner for ten or five times,
note the level of the child's hunger and fullness,
know how many breastfeeding a day are normally adequate.
Also often grasp (the breast) and discard the overnight milk.

.

If the child is lying down,
The wet-nurse should place (its) head on her arm,
make the breast even with the child's head, then breastfeed it;
(this) makes the child not choke.

5.4 Women's sources of influence and support

Hung et al [204] randomly selected 714 women with infants aged 4 weeks to 6 months in 17 hospitals and clinics in Hong Kong in 1985 and reported the sources of information they were exposed to. The women were considered in 3 groups: 605 bottle feeding (BOT), 88 successful breastfeeding (SBF) and 22 failed breastfeeding (FBR). A 2-weeks criterion was used to separate the failed or successful breastfeeding groups. They identified several factors significantly associated with feeding practices. (1) had seen breastfeeding advertisements on television; (2) had seen advertisements for bottle feeding on television; (3) had bought books themselves and had read them; (4) had been told dangers of bottle feeding and (5) encouragement of breastfeeding from doctors. Bottle-feeding mothers were influenced more by medical professionals who did not support breastfeeding. This influence was further reinforced by the mass media and particularly television advertisements about infant formula. The successful breastfeeding mothers, on the other hand, were influenced more by their social networks through which they were told of the dangers of bottle-feeding. The failed breastfeeding mothers differed from the other groups in the lack of support they experienced from friends and relatives. Although they received professional encouragement to breastfeed, they were more sheltered from the influence of mass media and social networks. From these findings, it is suggested that different sources of influence are related to different feeding practices. However, to be able to continue breastfeeding, the availability of social support is essential.

Husband, friends and relatives were the two most frequently reported influences. In the SBR group, the husband was the most influential factor, followed by friends and relatives. This finding highlights the importance of social network support. In the BOT group, feeding practice was influenced most by the medical professionals and the FBR group had influence patterns somewhere between the previous two groups.

There are methodological limitations to this study. The relatively small size in the FBR group makes interpretation for this group less certain. However, it suggests that in deciding and following a feeding method, different mother groups reported influence by different sources. Many doctors did not encourage breastfeeding. But other influences – family members,

social network and mass media and advertising were also potent in discouraging breastfeeding.

A more recent study in Hong Kong [205] included 39 Chinese lactating mothers who intended to breastfeed exclusively for at least 3 months and were followed for 6 months postpartum and were compared with 20 mothers who intended to use formula feeding. They lost some participants during follow-up in different stages of this study, which was not clearly described. The majority (97%) of the breastfeeding group stated that they were given information on the benefits and management of breastfeeding. Nineteen out of these 39 planning-to-breastfeed mothers did not seek for help during lactation, considering that help was not necessary. However, by 3 months postpartum, 58% (11/19) had stopped breastfeeding, 11% (1/19) were partially breastfeeding (not defined) and 32% (6/19) were still predominately breastfeeding. The majority (number not reported) of the 19 mothers said they were knowledgeable about breastfeeding but found it difficult to apply their knowledge practically.

In Shanghai, Meehan and colleagues [206] conducted a study in university hospitals, interviewing 123 women before and after delivery. 100% were primiparae and 25% had Caesarean section. 63.4% had received breastfeeding instruction prenatally (not described), but 86.2% of them did not receive information after delivery. However, there was no mention of the relationship between receiving instructions and breastfeeding behaviour.

Another study [207] in Luwan District, Shanghai surveyed 106 women in a Maternal and Child Health Centre. Among 46 mothers who breastfed more than 4 months postpartum (breastfeeding was defined as baby receiving breast milk with no more than 120 ml infant formula a day), 35% reported that their relatives did not support breastfeeding. In the mixed-feeding and bottle-feeding groups, 42% and 44% respectively stated that their relatives did not support breastfeeding. "Relatives" was not defined, however it is reasonable to assume that this meant "husband" and "mother-in-law" because the author stated that to increase the breastfeeding rate, it is very important to educate husbands and mothers-in-law. Moreover, although 92% of mothers reported that doctors supported breastfeeding, it was stated that doctors' support did not affect mothers' feeding choices (statistics not provided).

Li and her colleagues [208] conducted a cross-sectional survey of 506 Mandarin-speaking women in Perth to identify determinants of the initiation and duration of breastfeeding for the most recent birth by Chinese Australian mothers. Of the 506 mothers who completed the questionnaire, 193 mothers had given birth only in their home countries, 214 mothers only in Australia, and 99 mothers had a child in both their home countries and Australia. The age of the women ranged from 23 to 59 years, with a mean age of 40. More than half of the women (63.6%) had resided in Australia for more than 5 years. Almost half of them (42.1%) were not in formal employment, and more than half of the mothers' partners (53.8%) had professional work. Most were married (98.2%), came from Mainland China (81.6%), and were relatively affluent. In total, 82% of the participants' mothers had breastfed their children. Doctors' support of breastfeeding was positively associated with the initiation of breastfeeding both in the mothers' home countries (OR, 9.94; 95% CI, 3.17-31.18) and in Australia (AOR, 16.78; 95% CI, 7.12-39.55) and with duration. Mother's level of education

was positively associated with the initiation of breastfeeding in the mother's home country (OR, 3.04; 95% CI, 1.36-6.80) and positively associated with the duration of breastfeeding both in the mother's home country and Australia. Father's preference for breastfeeding (OR, 4.96; 95% CI, 1.93-12.66) and health professionals' support (OR: 16.78 95% CI: 7.12-39.55) were positively associated with the initiation of breastfeeding of the mother giving birth in Australia. Moreover, after adjusting for potential confounders, health professionals' support ($p<0.01$), older maternal age (0.004), use of traditional methods to help produce more milk ($p<0.001$) and higher maternal education ($p=0.006$) were associated with longer overall duration of all breastfeeding.

For mothers who had given birth in Australia in this study, the father's preference for breastfeeding was positively associated with the initiation of breastfeeding. Women whose partners preferred breastfeeding were almost 5 times more likely to initiate breastfeeding (OR, 4.94; 95% CI, 1.93- 12.66) than were women whose partners preferred bottle-feeding or did not care how the mother fed the baby. There was no association between father's preference and breastfeeding initiation for women delivering in the home country. In traditional societies, women are supported by their mother and other female relatives. However, following migration to Australia, Chinese women are usually separated from their extended families. As a result, the mothers may rely more heavily on their partners to support their breastfeeding decisions than in their home country.

In conclusion, health professionals could provide invaluable support for mothers initiating and continuing breastfeeding in this population. Prenatal education also needs to emphasize the ways in which fathers can support and contribute to breastfeeding.

5.5 Reasons for discontinuation of breastfeeding

In Singapore, the Breastfeeding Mothers' Support Group surveyed 63 women [209] , apart from those who were still breastfeeding (n=20) at the time of survey (not specified) , 91% of the women breastfed less than planned, 2% breastfed as planned and 7% breastfed longer than planned (breastfeeding not defined). In Shanghai, a study of 123 women [206] investigated pre-delivery breastfeeding intentions. The majority (91%) planned to breastfeed, and 88% to breastfeed 6 to 8 months; however, only 66.7% actually breastfed (13.3% exclusively; 53.4% mixed) more than 4 months. Of 29 women who had stopped breastfeeding at the time of interview at 3 months, 20 (69.0%) stated that insufficient milk was the first reason for weaning (weaning was not defined), followed by a maternal problems (n=13, 44.8%)

Meehan et al [206] also reported that poor breast conditions (including sore nipples and engorgement) were common problems in initiating breastfeeding.

Chan et al's study [205] in Hong Kong found those who are professionals or housewives are more likely to breast-feed. They also reported that the most rapid discontinuation rate of breastfeeding was during the first few weeks postpartum and by 6 weeks, almost half the subjects who had planned to breastfeed exclusively for 3 months of more had stopped breastfeeding. At 3 and 6 months postpartum, 41% and 31%, respectively of women were

still giving some breast milk to their babies. In Chan's study, the main reasons for discontinuation were perceptions of insufficient milk supply (44%), breast problems (31%) and being too tired (28%). Pressure from family members, mother's health and intending to help the baby to adapt to weaning foods were also reported (percentage not provided).Huang et al's study in Shanghai [207] showed that the most common reason given for not to breastfeed (time not defined) was having "no breast milk" (n=27, 40.3%) and "little breast milk" (n=24, 35.8%). In Singapore, most mothers plan starting to wean 4 to 6 weeks postpartum, giving themselves 2 weeks to adjust to changes of feeding pattern before beginning work. Maternity leave is usually 56 days in Singapore and most mothers take it postpartum rather than antenatally, to spend more time adjusting to the new baby [142]. The common reasons for early weaning in both studies [183, 184] were mothers complaining of insufficient milk ([183] n=7, 18%; [184] n=18, 41%), the need to return to work ([183] n=10, 26%; [184] n=11, 27%), sore nipples ([183] n=7, 18%; [184] n=5, 12%), and the lack of social support ([183] n=5, 13%). In Taiwan [210], Baby Mother Magazine also reported that nearly 60% of mothers terminated breastfeeding because their perceptions of inadequate milk supply (n=209, 59.6%).They also reported that 85% of bottle-feeding mothers had attempted to breast feed, but gave up with lack of support. As 93.3% of mothers perceive that breast milk provides good source of immunity to their babies this may be attributed, in part at least, to vigorous infant formula advertisements saying modern technology enables formula to be as good as breast milk as a source of immunity. However, the authors did not report the well-recognised reason of giving up breastfeeding – breast problems e.g. sore nipples, engorgement. This may due to poor awareness and training for breast conditions, with women being told "you have to suffer if you want to breast feed" with breastfeeding portrayed as an "unpleasant experience". Another study [146] recruited 106 migrant Chinese mothers (born in China) living in south-west Sydney to seek information on breastfeeding prevalence, knowledge and beliefs. The sample reflected a major group of first-time mothers who were well-educated non-smokers and mostly married. Differences in beliefs about breastfeeding and bottle-feeding between migrant and indigenous groups of mothers were also examined. Sixty-five percent of Chinese mothers exclusively breastfed their infants on discharge, with 6.9% partially breastfeeding (breastfeed with some formula milk). However, only 34% still exclusively breastfed at three months. The most important factor influencing mothers' choice to breastfeed was the belief that it was 'good for the baby', whilst mothers choosing to bottle-feed were influenced by perceived low milk supply and the belief that it was easier.

Table 5.1: Feeding intentions and attitudes/beliefs that influenced feeding choices among migrant Chinese women in Sydney (n=106) [146] .

Factors	Number (N)	Percent (%)
What was the most important factor influencing your choice to breastfeed? (N=70)		
Others – good for baby*	49	70.0
Personal preference	13	18.6
Feel it's the right thing to do	3	4.3
Breastfed before	1	1.4
Easier	1	1.4
Normal practice for Chinese	1	1.4
Doctor's influence	1	1.4
Hospital's advice		1.4
What was the most important factor influencing your choice to bottle-feed? (N=36)		
Insufficient milk	19	52.8
Easier	8	22.2
Other reasons	3	8.3
Personal preference	2	5.6
Difficult attachment of baby	2	5.6
Breastfeeding is uncomfortable	1	2.8
Partner's wish	1	2.8

* Stated by mothers

The author compared the knowledge of and attitudes to feeding practices among the mothers in this study and Chinese mothers in Hong Kong in Wang et al's study in 1986[144]. These studies used the same survey questions.

Table 5.2: Comparison of misconceptions about breastfeeding between immigrant and indigenous Chinese mothers (percentage of women noting "yes" with the statement)

Characteristics	Immigrant mothers		Indigenous Hong Kong mothers	
	Breastfeeding (n=73)	Bottle-feeding (n=28)	Breastfeeding (n=69)	Bottle-feeding (n=187)
Bottle-feeding maintains figure	26	39	36	41
Bottle-feeding causes less neonatal infection	21	39	20	29
Bottle-feeding is cheaper	10	7	10	9
Breastfed babies become "too attached" to the mothers	84	61	5	4
Breastfeeding affects the healing of an episiotomy wound	11	7	3	-
Breastfeeding is dirty	3	18	2	-
Breastfeeding mothers become less healthy when they are drained of breast milk	25	32	2	-

Table 5.3: The characteristics below are from the immigrant sample only [146] only (n=260)

	BF(n=73)	FF (n=187)
Mothers have insufficient milk for their babies needs in the first three days after delivery	44	20
Breastfeeding restricts a mother's ability to eat traditional Chinese food catering for condiment	22	9
Australian infant formula is better than those buy in China	59	25
A fat baby is a healthy baby	58	25

Among these women, 65% exclusively breastfed at discharge, with a marked drop to 34% (52% reduction) at 3 months postpartum. This compared with Australian data suggesting 76-80.5% of (non-Chinese) Australian women breastfed exclusively for some period of time [43]. Comparisons with other immigrant Chinese populations demonstrated similar findings. A study of immigrant Chinese mothers in Montreal [145] reporting exclusive breastfeeding prevalence of 43% to 59% at birth and then 26% to 28% at 3 months, nearly 50% reduction.

When looking at actual reasons for terminating breastfeeding, a highly consistent pattern emerges. A large proportion of mothers stopped breastfeeding early, primarily due to problems associated with initiating and maintaining lactation or technical difficulties with breastfeeding. Many mothers assume that they do not have enough milk to satisfy their babies, a belief very often supported by health professionals and family and friends, who readily recommend breast milk substitutes as an appropriate solution to their problems. This implies that they are an equal alternative but unfortunately breastfeeding is abandoned without concern. Perception of an inadequate milk supply is the most common reason for stopping breastfeeding early on. The cause is often iatrogenic due to mismanagement during the crucial early phase. Many hospital policies and practices interfere with the normal physiological process of lactation. The hospital environment influences mothers' behaviour in infant feeding in many respects. It dictates when and how the mother is able to see, touch and feed her baby. Many routines provide mothers with messages about alternatives of feeding and may lead to confusion. Hospital practices often expose mothers to medications and procedures that may make it difficult to establish lactation or the baby's development in breastfeeding. Staff attitudes may be ambiguous, inconsistent and even harmful[211]. Introducing of complementary feeds between 3-4 months postpartum is predominantly the result of returning to work, mother's time and convenience and belief that breast milk is no longer necessary for the baby [212]. Children are not reared in an environment where breastfeeding is the norm and cultural beliefs may not condone breastfeeding toddlers. Many people naively believe in the virtues and equality of formulas and minimise or disregard the unique active biological properties of human milk. Traditionally, society supported new mothers and passed on the skills of mothering including breastfeeding through the extended family members. In the present modern or urban societies, this support is vanishing.

5.6 Breastfeeding vs. Bottle feeding – Determinants

Many factors affect how women feed their infants and the length of time they breastfeed. It would be useful to be able to draw conclusions from the studies investigating Chinese people, however, evidence for definite and strong effects of specific factors is lacking. Therefore, I

can only present summaries of studies conducted in non-Chinese populations, mainly in Western societies and this only as summaries. Whether these conclusions are transferable to the Chinese population is not really known; they nevertheless provide information on the determinants of infant feeding behaviours. These have been extensively [19, 213-215] reviewed and they include (1) living environment (urban or rural); (2) socio-economic status; (3) maternal education; (4) the women's employment and (5) commercial pressure and knowledge and availability of breast milk substitutes[216]. Women's decisions about infant feeding may be influenced by perceived or actual attitudes of the child's father [217-220] and other family members, friends; and the amount of support she may have to carry her decision through. The factors that can affect breastfeeding are not only many and complex, but operate differently in different situations. For example, the influence of a child's father may depend on the extent to which, in the society in question, a woman's partner has control over her body; also maternal education has been associated with higher breastfeeding prevalence in industrialised countries and with a lower rate in developing countries [19]. Factors also vary with time in the same community, and partial and exclusive breastfeeding may have different determinants[221]. Cultural attitudes towards breastfeeding and sexual symbols and women's confidence in their ability to lactate may also differ and influence attitudes to breastfeeding. Some of these issues are summarised in Table 5.4

Table 5.4: Conceptual framework for determinants of breastfeeding in an industrialised society [222].

Concept	Positive impact	Negative impact
Demographic attributes	High education and age of mother, small family	Low education, young age, single mother, urban, first child, employment
Psychosocial attributes	Supportive family and peers, cultural acceptance, previous successful breastfeeding experience, having seen mother breastfeeding, breastfed as a child	Low maternal confidence, shyness, mother not breast fed herself
Health care attributes and biomedical constraints	Early initiations, prenatal education, participation, skill training, apprenticeship, low-birth-weight baby, maternal belief regarding breastfeeding and health of the baby	Premature birth, difficult labour, use of analgesics, sore nipples, maternity ward use teats and bottle feeding, distribution of free samples of breast milk substitutes, being separated from the baby, inadequate support, professionals giving inconsistent information, wards giving supplementary feeds, scheduled feeding
Community attributes	Consensus statements, media advocacy, workplace support, existence and acceptance of peer support groups, high level of community awareness and knowledge regarding breastfeeding prevalence and process	Breastfeeding considered as indecent exposure, miss-beliefs, low level of community support, low media advocacy
Public policy	Official recommendations, surveillance systems, maternity benefits including prolonged paid maternity leave, BFHI, inclusion of breastfeeding into school curriculum and health care staff training, International Code of Marketing	Short maternity leave, low priority of breastfeeding as a health concern, no supportive for breastfeeding issues

Breastfeeding is a biological behaviour with deep roots in human societies, although there are great variations across settings [199]. Scott [213] reviewed the recent literature identifying factors associated with the initiation and duration of breastfeeding. These papers revealed that the associations between breastfeeding and many of the factors commonly investigated were not consistent. Many of the strong associations previously reported in univariate studies were not evident in more recent studies, which have employed multivariate analysis to control for covariates and potential confounders. While there were strong and consistent associations with demographic factors such as maternal age and level of education, there were less consistent associations with factors such as marital and socio-economic status. Similarly, the earlier reported univariate associations between breastfeeding and biomedical factors such as parity, method of delivery and infant health have turned out to be less consistent in multivariate studies. However, a consistent negative association has been reported between maternal smoking habits and breastfeeding duration. There is evidence suggesting that fathers play an important role in the breastfeeding decision and that intended duration is a strong predictor of actual duration. Despite inconsistency of the reported associations, the review highlighted the fact that influences on breastfeeding are multifactorial, and future programs aimed at promoting breastfeeding must take this into consideration.

We now turn to relatively few studies in Chinese population.

Chen et al [223] recruited 591 mothers who completed a follow-up questionnaire at one month postpartum in Taichung, an urban city. The total breastfeeding rate (breastfeeding not defined) declined from 83.4% before discharge to 50.8% at one month. One-hundred and fifty-three (25.9%) mothers exclusively breastfed, 147 (24.9%) mothers mixed fed, and 291 (49.2%) mothers formula fed their babies at that time. Among the mothers who initially intended to breastfeed exclusively, 39.3% changed to formula feeding, while 7.1% of the mothers who intended to mix feeding and 4.8% of the mothers who intended to formula feed changed to exclusive breastfeeding at one month postpartum. Nine percent of the breastfeeding mothers weaned within the first week, 9.2% weaned between the first and second week, 8.4% weaned between the second and third week, while another 14.8% weaned between the third and forth week. Milk insufficiency, maternal tiredness, not knowing whether the infant had enough to eat and breast problems were the four major reasons for changing feeding method from breastfeeding to formula feeding (percentages not provided). A positive breastfeeding attitude, non-employment and husband's approval of breastfeeding were negatively associated with changing feeding behaviour from breastfeeding to formula feeding within one month postpartum.

Another recent Taiwanese study [224] investigated breastfeeding practices studied in 251 mother-infants pairs at the well-baby clinic of a regional hospital in Taitung, which is a rural city. A questionnaire was designed to elucidate factors influencing the initiation and duration of breastfeeding. Most of the mothers (81.7%) reported that they initiated breastfeeding after delivery, but only 20.7% continued breastfeeding for at least 4 months. Factors positively associated with breastfeeding initiation were the approval of the baby's father and grandparents and assistance from healthcare staff (p values not reported). Infants who were hospitalized during the neonatal period and those born in the largest regional hospital were less likely to be breastfed. Women who were employed and those with a higher education

level were less likely to breastfeed ≥4 months. Among infants ≥ 4 months old at the time of the study, those who were younger were less likely to breastfeed for at least 4 month. The father's approval was positively associated with the duration of breastfeeding (details not given).

The quality of report and the rigor of these two studies [223, 224] were inadequate, however, they provided information that is directly relevant to Taiwan. I will discuss other non-Taiwanese studies below.

Koo et al [225] interviewed 413 mothers who had given birth to healthy term infants in last 2 years in Hong Kong in 1986. The mean age of the 413 mothers was 27 years (range 17-42) and the mean age of the infants was 30 weeks at the time of interview (1 week – 2 years). The percentage "ever-breastfed" was 28.1 and the mean duration was 10 weeks, although about 1/3 of the babies were breastfed for less than 1 week. Most of the breast-fed babies (61%) were removed from the breast after one month of age, and only 11 were breastfed for more than 6 months. Breastfeeding was defined as "breast-fed only". Table 5.5 shows breastfeeding by socio-economic exposure.

Table 5.5: Socioeconomic factors related to the incidence and duration of breastfeeding (%) [225].

Variable	Infant feeding (n=413)		Duration of breast feeding (n=116)		
	Breastfeeding *	Bottle-feeding **	<2 weeks	2-6 weeks	> 7 weeks)
Mother's education					
Primary	23.7	76.3	39.0	14.6	46.3
Secondary	31.1	68.9	36.7	24.6	39.1
Tertiary	35.3	64.7	54.0	50.0	0
Father's education					
Primary	18.4	81.6	34.8	13.0	52.2
Secondary	31.3	68.7	38.5	18.7	42.3
Tertiary	42.4	57.6	42.9	57.1	0
Family income (H.K.$ per month)					
<2,500	28.4	71.6	41.4	6.9	51.7
2,500-4,999	29.5	70.5	37.5	17.2	45.3
5,000-9,999	19.4	80.6	28.6	64.2	7.1
≥10,000	42.9	57.1	44.4	44.4	11.1
Mother's working status (6 m pregnancy / 6 m after delivery)					
+ / +	30.4	69.6	50.0	29.4	20.6
+ / -	29.8	70.2	44.1	17.6	38.2
- / -	27.1	72.9	26.1	19.6	54.3

*:ever breastfed. **: never breastfed.

Breastfeeding had a positive relationship with either parent's education level, more strongly for the father's education than the mother's. Among breastfeeding mothers, the duration of breastfeeding was inversely related to the mother's education. The middle-income group ($HK 5,000-9,999 per month) had both the lowest incidence and the shortest duration of breastfeeding. They found no association between birth order and breastfeeding, but a slight tendency for second or third children to be breastfed for longer. More importantly, if the previous child had been breastfed, this child was more likely to be breastfed.

Table 5.6: Birth order and feeding practice* (%)[200].

Birth order	Feeding method			Duration of breastfeeding			
	Breastfeeding	Bottle feeding	Number	<2 weeks	2-6 weeks	>7 weeks	Number
First	31.2	68.8	215	46.3	46.3	31.3	67
Second	24.3	75.9	141	23.5	23.5	52.9	34
Third	32.4	37.6	34	27.3	18.2	54.5	11

*21 subjects were born of more or equal to the forth order were excluded. No detail how this table was tabulated

About 30% of the mothers believed breast milk is superior to infant formula, and 2/3 of these had ever breastfed their babies. However, 30% of mothers thought formula is equivalent to breast milk, and 2/3 of these exclusively bottle fed their babies.

Meehan et al's descriptive study in Shanghai [206] showed that among the 123 women, 33.8% of them exclusively breastfed for one month, 25.4% and 15.5% for 2 and 3 months respectively. They found that mother's age (20-35 years old, average age was 27) and education (all of them had at least junior high school education) were each correlates of duration of breastfeeding. Education was negatively correlated to duration; and mother's age was positively correlated.

Huang et al [207] also stated that they explored several reported reasons for poor lactation in Shanghai. In their survey, 20% of mothers gave the first feed within 24 hour reported after birth and 80% in 48 hours. Fifty percent of women in their study had Caesarean section. The authors pointed out that in general; women with CS started breastfeeding in 3 days, but some didn't make it until 7 days post-operation. Then they stated that delayed first feed was associated with poor lactation, although the baby's condition was important as well. Most (93%) of the babies were born full-term, 5% were pre-term and 2% were over-term. More importantly, the hospital policy made a major contribution to lower breastfeeding prevalence. Mother infant separation was a routine practice and 53% of mothers breastfed their babies less than 4 times per day and only 6% breastfed more than 8 times daily. The majority of the newborns were fed sugar fluids before the first breastfeed (percentage and number not reported) and supplementary feeds of either glucose water or formula milk were very common. Mother's lack of instruction due to staff shortage at the time was reported, without any figures. Eighty-one percent of the mothers stayed in hospital for more than one week postpartum and postpartum education was considered as an effective way of encouraging breastfeeding. No relationship was found with education level, mother's emotional status, baby's suckling strength (not defined) and drugs used at delivery.

Other studies in Shanghai in the 1980s found one third of mothers did not initiate breastfeeding [226, 227]. Chen [228] did an analysis on the combined data from the Jingan and Changning studies[19, 226], with 3285 children. He found that boys, those with higher educated fathers, and those born by assisted delivery or caesarean section were more likely to be artificially fed. He also reported that infants whose birth weight was around 3750 g had the lowest probability of artificial feeding; higher and lower birth weights were positively associated with artificial feeding. Previous studies have revealed that lower birth weight was related to less and shorter duration of breastfeeding [214, 229] but the results are inconsistent. Chen's U-shape relationship between birth weight and quantity of artificial feeding had not been mentioned before. He speculated that the relationship could arise because small infants

have difficulties in establishing suckling and proper attachment, and large infants require more milk that appeared not to be satisfied by their mothers. Physiologically, healthy mothers should be able to produce sufficient milk as long as the babies suckle frequently enough. The difficulty to breastfeed a large baby might more directly linked to its heavy weight, i.e. too heavy to position and attach properly, plus mother's perception that her milk may not sufficient to the baby, thus leading to breast problems, and/or baby's discomfort, resulting nipple refusal, and eventual artificial feeding.

In this analysis, it was found that paternal education was positively associated with the amount of artificial feeding. Some previous findings [230, 231] also showed that family education was adversely related to breastfeeding while some showed positive relationships[214, 229]. It has been concluded that although breastfeeding is positively related to socio-economic status in most developed countries, there is an inverse relationship in developing countries. A woman's partner (usually the newborn's father) has been identified consistently as the primary source of support in initiation of breastfeeding [232, 233]. In a study in the US [234] concluded that, regardless of maternal age, education level, ethnicity, and marital status, women who indicated that their partners preferred breastfeeding were significantly more likely to initiate breastfeeding, compared with women whose partners were ambivalent or preferred bottle-feeding (OR = 32.8, 95% CI :6.7–159.5). In other studies, the partner's breastfeeding attitude still remained the most influential factor in the women's decision to initiate breastfeeding; partners were more important than physicians, lactation consultants, or nurses [235]. Giugliani [236] in another study of 181 U.S. fathers, found that although male partners generally had poor knowledge of breastfeeding, fathers who received breastfeeding information from professionals were significantly more likely to encourage breastfeeding by their partners. As with mothers, however, lower socioeconomic status is significantly associated with a decrease in breastfeeding initiation and duration, in Western countries [237, 238].

It has been found that higher income women in less developed countries may perceive breastfeeding as old-fashioned and a sign of lesser social status; such women bottle-feed to be modern and "Westernised"[239]; there was no discussion of child gender inequality in this Chinese analysis. In Australia, Scott et al [220] found that boys were breastfed for shorter period than girls; while no gender difference was found in Uppsala [240]. In Chinese settings, it is logical to assume that parents in Shanghai (see above) perceived infant formula as a product of modern technology that may be better to children; a boy is the "heir" and a property of the husband's family, and only bottle-feeding allows more paternal involvement. In this analysis "father's education" is a strong factor associated with infant feeding practice and Koo et al. [225] reported similar findings. The Chan study in Hong Kong [205] found that mother's education is positively related to intention of breastfeeding and no data was presented about husbands' attitudes. No significant relationships were found between the quantity of artificial feeding and maternal age, maternal education, maternal history of spontaneous abortion, and average family income in this study. Table 5.7 shows results from study in Shanghai [228].

Table 5.7: Relationships of factor and quantity of formula feeding in Shanghai [228]

Variable	Number (N)	Percentage (%)	χ^2 P value
Infant gender			
Male	1706	35.9	3.407
Female	1579	32.9	0.065
Multiple birth			
Yes	68	40.4	10.501
No	3217	33.7	0.001
Father's education			
University	354	52.9	6.190
Secondary or primary	2931	34.1	0.013
Maternal age			
< 30 y	2482	34.3	0.079
≥ 30 y	803	34.9	0.779
Mother's education			
University	149	32.9	0.171
Secondary or primary	3136	34.5	0.679
Type of delivery			
Spontaneous	2263	32.1	18.218
Assisted	448	39.7	<0.001
Caesarean section	574	39.7	
History of spontaneous abortion (miscarriage)			
Yes	303	37.6	1.480
No	2982	34.1	0.224
Average household income per head			
< 25 yuan	60	35.0	1.050
25-49 yuan	2899	34.7	0.591
≥ 50 yuan	326	31.9	

Women's obstetric experiences may also influence breastfeeding behaviour. formula feeding was more common in infants born assisted or by Caesarean section in some studies [229, 241]. It has been demonstrated that assisted delivery and C-section are associated with delayed onset [242] but not duration once breastfeeding has commenced [243]. However, some researchers found no relationship between mode of delivery and breastfeeding [244, 245]. Poor conditions of artificially delivered infants and mother infant separation have been suggested as factors of delayed initiation of breastfeeding [241]. The effect of labour analgesia on breastfeeding outcomes is controversial [246].

Summary

Breastfeeding was one of the natural components in the reproductive cycle however in ancient Chinese society, and breastfeeding and the property of breast milk were documented in ancient medical texts. Wet nursing and selection of wet nurse was a common knowledge possessed by predominantly wealthy people in ancient Chinese society.

The demographic factors related to breastfeeding in Chinese women are largely similar to those in Western societies. Older women and women with higher education and better social economic background tend to breastfeed more. The significant factors influencing infant feeding behaviours include husband and mothers or mothers-in-law. It is difficult to differentiate women's own mothers and the mothers-in-law in some studies because women sometimes call their mothers-in-law "mother", and the practice varies in different areas and is

not always well described.

The common reasons for discontinuation of breastfeeding are quite consistent with those in western societies. Perceived inadequate milk is at the top, and other reasons like problems with positioning and attachment were also commonly cited.

The influence of health professionals were mentioned but not extensively discussed in this chapter because of lack of information. Moreover, it is unlikely one can find out the "true" pictures from Chinese people in this respect simply by survey. It is considered good virtue to praise always, to respect health professionals and show no negative emotion especially in public or to a stranger.

Since the breastfeeding promotion programme in Taiwan has had a strong health professional's orientation, it is important to address this issue deeper.

6. The influence of health professionals on breastfeeding intention

As mentioned in the previous chapter, studies of the influence of health professionals and the effectiveness of public health interventions in their impact on breastfeeding in Chinese society have been lacking. I present studies conducted in non-Chinese societies to fill this gap. Also as mentioned above the findings from other settings may not be completelt generalisable to Chinese and to Taiwanese society, but they nevertheless provide relevant information.

6.1 Policy and guidelines

The development of professional guidelines is at the centre of present breastfeeding promotion policy. The intervention based on the WHO/ UNICEF "Ten Steps to Successful Breastfeeding", which was based on extensive evidence [172]has been the only breastfeeding promotion instruction in Taiwan. Despite its introduction, there has been little appreciable change in breastfeeding prevalence in Taiwan [151, 247] and no evidence showing fewer women experiencing breastfeeding problems in hospital. It is clear that changes in hospital practice, such as not giving bottles to breastfeeding babies, not separating mother and baby and putting the baby to the breast soon after birth, may contribute only a small part to the reasons why so many women give up breastfeeding or even do not breastfeed at all. Given that most women decide how they will feed their babies before pregnancy or at least by the third trimester [248] , as also found in this study, it is likely that hospital practice will not exert a large influence on the decision to breastfeed., The professional-centred approach does not take mother's perspectives into account, which may further its ineffectiveness. As mentioned by Graffy et al [249] supporting women who had intention to breastfeed may be the better use of resource and have better outcomes.

The National Committee on Breastfeeding in Ireland undertook a review of the Irish National Breastfeeding Policy. This review [250] showed that the policy was associated with positive impact on BF practices in the health services, in line with the 10 Steps, as well as on the expertise and level of training within some groups of health workers. However, it did not have a major effect on national prevalence.

In Nova Scotia, Canada, a provincial policy and programme proposed by health professionals, involving access to prenatal classes, nurse follow up after hospital discharge and availability of lactation consultants, led to an increase in initiation of breastfeeding [251].

6.2 The theory-practice gap

As mentioned above, hospitals in the breastfeeding promotion programme assessment in Taiwan reported the mean breastfeeding prevalence at discharge as 28.6%, but only 12% of mothers delivered in BF Hospitals reported in a community survey that they breastfed at discharge, during the same period of time [151, 247]. This almost certainly reflects the lack of audit of the quality of information obtained by local BFHI assessment.

Several studies have reported a theory-practice gap with professionals not implementing

guidelines [252, 253]. Beeken et al [243] sent questionnaires to 213 midwives and health visitors (response rate 92%) in Newcastle upon Tyne looking at activities based on WHO/UNICEF guidelines. Questionnaires were answered by 90 (response rate 50%) first time mothers who had ever breastfed. Comparison of responses from professionals and mothers demonstrated a gap in applying policies, like separation of mother and baby, giving formula milk to breastfed babies and not putting babies to the breasts soon after birth. Whereas professionals stated that these events happened infrequently, women reported a much higher occurrence. There are methodological problems in interpreting this study, particularly a low response rate and reduced sample size with no information about the non-responders and only basic statistical analysis. A study in Hong Kong [254] investigated how health professionals handled breastfeeding and infant formula in hospital. The general attitude was found to be vague, not positive and inconsistent. The attitude was vague because infant formula was not clearly defined as either a pharmaceutical or food product. The attitude was found to be not positive because the health professionals normally left the decision to the mothers. Moreover, hospitals regularly received free infant formula supplies from different companies. Thus, even if the doctors were asked which feeding method to adopt, they would recommend bottle-feeding. Posters, promotion vouchers and other materials delivered via the hospital also carry the implicit endorsement and credibility of the health professionals. These have important impact on the mothers.

It is clear that health professionals should bear some of the responsibility for low breastfeeding prevalence. Hospital policies that allow free formula samples and advertising on educational materials compromise the "breast is best" message. Garforth et al [253] in a study used observational methods in labour and postnatal wards, supplemented by short interviews with women and their key midwife. Participants were not aware of the study's focus. Attitudes of midwives varied between those who saw the initiation and support of breastfeeding as a priority and those who viewed it as an optional extra, if there was time after the routines of weighing, examining and bathing the baby. Taveras et al [255] conducted a prospective cohort study of low-risk mother-newborn pairs and their clinicians in a large multi-specialty group practice. The participating mothers completed telephone interviews at 4 and 12 weeks postpartum, and their data were linked with their obstetric and paediatric clinicians' responses in a cross-sectional mailed survey conducted during the same time period. Overall, response rates were 63% for mothers (n = 429) and 82% for clinicians (obstetrician: n = 54; paediatric clinicians: n = 67). At 4 weeks postpartum, 319 mothers (74%) were either exclusively or mixed breastfeeding. According to the interviews, few mothers discussed breastfeeding duration with their obstetric clinicians during their prenatal visits (15%) or with their paediatric clinicians during their infants' 2-week preventive visit (24%). Among 164 mothers whose obstetric providers said they usually or always discuss breastfeeding duration during prenatal visits, only 26 (16%) of the mothers reported that the topic was discussed with them (22% agreement; kappa = -.004). Among those mothers whose paediatrics clinicians said they usually or always discuss breastfeeding duration during the 2-week preventive visit, only 25% of the mothers reported that the topic was discussed (32% agreement; kappa =.05). Many of the mothers had either returned to work by 12 weeks (29%) or planned to return to work within the next few months (43%). Although nearly all the obstetric (91%) and paediatrics (97%) clinicians reported that they usually or always discuss whether a mother plans to continue breastfeeding after returning to work, only approximately

half (55%) of the mothers seen by the clinicians reported that the topic was discussed. Overall, few mothers reported discussing with their clinicians specific ways to continue breastfeeding after returning to work. These findings highlighted that mothers' reports of breastfeeding advice given during routine preventive visits identified several areas in which unintentional communication gaps may occur, including specifics about breastfeeding duration and methods of breastfeeding after returning to work. Developing approaches to enhance communication with mothers during routine preventive visits could improve the support of breastfeeding.

6.3 Setting target prevalence for breastfeeding: is it achievable?

After the survey in 1996 [150] reporting a 5% breastfeeding rate, the Department of Health in Taiwan targeted the breastfeeding rate at more than 46% 1 month postpartum by the year of 2001. There was no particular reason given how a 46% target was set, and the definition of "Breastfeeding Prevalence" was not clear. After launching the local initiative, the reported predominant breastfeeding prevalence was 24.03% with 41.86% of women mixed feeding their babies for 1 month. The official report then summed up these 2 figures and concluded: The total breastfeeding was 65.21% (from hospitals attending BFHI), which successfully achieved the 46% goal (set for the community) by the year of 2001. Thus the next goal was set that at least 50% of women breastfeed for at least 4 months postpartum by the year of 2004. This may seem very unrealistic for people advocating and promoting breastfeeding in Taiwan [256]; however, "It's better to have a go rather than do nothing!" "They (Chief Executives) have political pressure and need some striking figures and magic bullets to impress the public!"[257]. But, the recurrent problem of unclear definitions of breastfeeding prevalence makes it even more ambiguous; none of the official document clearly differentiates the types of feeding. In Scotland, Campbell et al [258] said that setting targets for increasing breastfeeding prevalence should be related to actions known to be effective. However, Hoddinott [259] argued that the evidence for usefulness of targets is weak and since most of the studies in looking at the relationships between Hospital practices and breastfeeding incidence are inevitably hospital-based, the generalisability must be questioned due to cultural diversity in breastfeeding practices. She went on to conclude that setting target prevalence for breastfeeding would probably be a waste of resources.

6.4 The health policy and professional's role in infant feeding decision

As discussed previously, there is considerable evidence of a theory-practice gap both at institutional and individual levels. Moreover, there is little evidence that information about infant feeding given by health professionals influences the infant feeding decision. The aim of the local baby-friendly initiative in Taiwan was that, by implementing the modified "Ten Steps", there shall be an increase of both the incidence and the continuation of successful breastfeeding [171]. In this aim, there is an assumption that by tightening guidelines or setting targets, breastfeeding prevalence will increase and fewer women will have breastfeeding problems.

Nevertheless, women's perception of "successful breastfeeding" may be different from the health professionals'. A study in the US [260] used semi-structured interviews to discover

the important components of successful breastfeeding from the mothers' perspective. A core concept of working in harmony emerged from the data, with 5 main categories of "successful breastfeeding": infant health, infant satisfaction, maternal enjoyment, and attainment of desired maternal role and compatibility with the mother's desired life style. Duration of breastfeeding was not necessarily an indicator of success, nor was demand breastfeeding. As the authors stated, the findings were well validated but may not be generalisable, as the sample consisted only middle-class women who were mostly successful breast feeders. They concluded that breastfeeding is a dynamic process and that advice needs to be individually tailored to attain a satisfying breastfeeding experience for both mothers and babies and this needs to be incorporated into the training of health professionals. Each of the 26 women in this study had a different concept of successful breastfeeding, demonstrating the complexity of interaction between mother and baby. Flexibility and exploring with the mother the five components of successful breastfeeding from her perspective is more likely to result in a satisfactory experience than protocols or guidelines, which are applied to everyone.

To look at how communication by health professionals about infant feeding is perceived by first time mothers, Hoddinott et al [261]conducted semi-structured interviews early in pregnancy and 6-10 weeks after birth among 21 white, low income women expecting their first baby in London. They found that the personal and practical aspects of infant feeding which were important to women were seldom discussed in detail in antenatal interviews with professionals. In postnatal interviews women described how words alone encouraging them to breastfeed were insufficient. Apprenticeship style learning of practical skills was valued, particularly time patiently spent watching them feed their baby. Women preferred to be shown skills rather than be told how to do them. Some felt pressure to breastfeed and bottle-feeding mothers on postnatal wards felt neglected in comparison. Women preferred their own decision-making to be facilitated rather than being advised what to do. Some women experienced distress exposing their breasts and being touched by health professionals. Continuity of care and forming a personal relationship with a health professional who could reassure them were key factors associated with satisfaction with infant feeding communication. A study [260] in the US reported that the most important goal for new mothers generally was maternal, baby and family well-being. Women wanted a contented, thriving baby, which would enable them to feel confident that they were being good mothers. In contrast, women perceive that the goal for health professionals is the initiation of breastfeeding then prolonging it for at least 4 months. These differing goals can give rise to dissatisfaction with communication, which is often seen as 'breastfeeding centred' rather than 'woman centred'. Women were keen to maintain ownership, control and responsibility for their own decision-making about infant feeding.

Furthermore, Giugliani et al [234] found that after adjusting for potential demographic confounders, breastfeeding guidance provided from doctors, nurses and / or dietitians had no association with the decision to breastfeed. Most women decide on their preferred infant feeding method before they come into contact with most health professionals, i.e. before conception or in early pregnancy [262, 263] . Cronenwett et al [264] reviewed a number of studies to determine the effect of professional support on the breastfeeding decision. Their findings suggested that health professionals are rarely perceived as sources of influence on feeding decision or sources of support with breastfeeding. In contrast, health professionals

tended to perceive themselves as the most important sources of influences on mother's decision about breastfeeding and viewed as secondary importance the influence of friends, husband, and relatives [264] . Several studies have revealed that lay advice and support from family and friends has been more important than professional advice and support, both with the decision and the actual experience of breastfeeding [265, 266]. McIntosh [266] found that in Scotland, advice from the women's social network tended to recommend formula feeding. When lay advice clashed with professional advice, the lay advice tended to win. Surveys of women's views of their care from health professionals after birth, suggested that inconsistent advice, lack of support, poor continuity of care, restrictive hospital routines and professional ambivalence are important [218, 265, 267].

Carter argued that breastfeeding does not fit with the needs of many women, and women did not want to be told how to feed their babies [268]. They preferred the advice, experiences and opinions of other women rather than guidelines or instructions given by health professionals. This may also be applicable to Taiwanese women to some extent. Women reported conflicting advice from health professionals [253, 267], and this was blamed for the sharp decline in breastfeeding in the first few weeks after birth in the UK [269]. A large survey [270] of family physicians, paediatricians and obstetricians in the US, found a wide spread lack of practical knowledge about breastfeeding and concluded that physicians are ill prepared to advise women on breastfeeding. Similar findings have been reported from Taiwan as well [186]. However, it is not clear to what extent conflicting advice influences women's breastfeeding decisions and behaviour. There appears to be no studies conducted in Chinese speaking populations exploring intentions and actual behaviour of infant feeding. Thus there is currently a knowledge gap of women's perception of information and support needs, when and where provision of information and support should take place, which should provide it and how.

6.5 Interventions to promote the initiation of breastfeeding

I found one Health Development Agency systematic review [271]summarizing the findings of two other quality systematic reviews by Fairbank [272] and Tedstone [273] about interventions to promote the initiation of breastfeeding. The findings are reported using the following categories of intervention for the promotion of initial breastfeeding:

- Health education
- Health sector initiatives
- Training of health professionals
- Social support from health professionals
- Peer support
- Media campaigns
- Multi-faceted interventions

Health Education

Health education interventions aim to provide factual information about breastfeeding. These may be delivered through educational sessions or leaflets and are often grounded in

professional expertise. The evidence appears to suggest that small, informal discussion classes, emphasizing the benefits of breastfeeding and giving practical advice on how to breastfeed can increase initiation prevalence. This may be particularly effective among women of certain ethnic groups. As the interventions show in this section are findings of systematic reviews, and there is no such study conducted in Chinese population, I can only present the findings conducted mostly in western countries. In general, written or printed information alone appears to have little impact.

Findings from Fairbank et al.[272]:

- There is some evidence that breastfeeding literature alone among the general population is not effective in promoting breastfeeding among women of different income and ethnic groups in the UK, Republic of Ireland and the USA.
- Breastfeeding literature and formal education among low-income groups in the USA were not effective at promoting initiation of breastfeeding. However, evidence here was based on small-scale studies. However, this evidence is based on a poor quality trial.
- Group health education can be effective among women from different ethnic and low-income groups in westernised countries. This is based on one US study[274] and one UK study[275] in which group sessions were shown to be effective, although there are some methodological weaknesses in both studies. An Australian study of Vietnamese women[276] also found group sessions to be effective.
- A further four RCTs in the USA targeted low income women, but only one reported increased initiation prevalence. This trial involved the use of a self-help manual designed to motivate women to breastfeed. It included a problem-solving section for managing common breastfeeding problems with usual breastfeeding advice. When the results were recalculated to include all women regardless of whether they withdrew, the findings were no longer statistically significant.
- One-to-one educational programmes were more effective for women who planned to bottle-feed, whereas group programmes were more effective for women who planned to breastfeed. This evidence is based on studies of low income black Americans.
- Paying participants to attend have been shown to be effective at increasing participation rates for group classes.
- In the UK, one study[277] assessed the provision of additional health education from community staff through face-to-face and telephone contacts in the antenatal and postnatal periods. Frequency of contact was increased, guidelines on managing breastfeeding problems were formulated, and telephone advice offered. This intervention did not significantly increase the number of women initiating breastfeeding
- A coordinated three-step approach to health education in women, with advice, leaflets and routine health education plus intensive staff training had significant effects on initiation prevalence. There may be some difficulties in generalising the intervention to Taiwan but, in principle, the combined approach could be effective.
- No studies reported statistically significant negative effects in terms of the number of women initiating breastfeeding or any other adverse effect.

Findings from Tedstone et al[273]:

- One-to-one educational sessions were more successful than group sessions when they were aimed at promoting initial breastfeeding with women who had already made a decision to bottle-feed.
- Breastfeeding promotions delivered in the period both before and after birth were most likely to have a positive effect on breastfeeding. These interventions were intensive, involving multiple contacts with a professional promoter or peer counsellor.
- The effectiveness of prenatal educational sessions in initiating breastfeeding was enhanced by contact with peer counsellors.
- Weaker evidence shows that including partners, providing incentives and changing the content of commercial hospital packs given to women upon discharge from hospital may aid promotion.
- The least successful interventions were those where breastfeeding promotion was only one part of the focus of multiple health promotion programmes and involved special visits to the hospital/clinic or took place by telephone.

Health sector initiatives

Initiatives in the health sector aim to change the organisation of health services and care received by women in favour of the promotion of breastfeeding. These interventions are mostly conducted in the hospital sector and have included evaluations of the training of health professionals, 'rooming-in' (a home-like, private room), the reduced use of artificial milk, health education activities and studies by the Women, Infant and Child (WIC) programme [278].

Findings from Fairbank et al[272]:

- In a combined approach, training of staff, employment of a breastfeeding counsellor, written information and rooming-in were effective for both initiation and duration in the USA among low income women. However, this evidence is based on a poor quality trial.
- Evidence suggests that initiation prevalence can be increased following the implementation of WIC programmes among low-income women. This large health sector initiative, set up by the US Department of Agriculture's WIC programme, focused on low-income American women and reported increases in initiation and duration of breastfeeding. Interventions included group or individual health education and/or peer support programmes delivered in both the antenatal and postnatal periods in either hospital or clinic settings. In particular, programmes including a peer support component appeared to influence breastfeeding initiation.
- Rooming-in has been shown to be an effective measure in developing country settings, although studies have before-after study designs. Rooming-in, early contact and breastfeeding education were effective for initiation and duration in Brazil.

Findings from Tedstone et al [273]:

- One study [279] evaluated a breastfeeding educational package in the USA, Best Start. This involved training health professionals to promote breastfeeding, educating women to make an informed choice and providing the support of a lactation specialist. These

measures were found to increase initiation prevalence. However, design problems may affect the validity of the results.

- Another study [280] evaluated the effects of policy changes in the UK, including the appointment of a breastfeeding adviser (BFA) and training of staff, and including the reduction of staff that worked predominantly night shift, to enable exposure to the new policy and training. The BFA trained maternity staff and ran prenatal and postnatal outpatient sessions for mothers, and visited all mothers in hospital after delivery. These measures, however, were found to have no effect on initiation or duration of breastfeeding. Thirty per cent of women reported not having seen the BFA and were found to be less likely to have started breastfeeding.

Training of health professionals

Findings from Fairbank et al.[272]:

• Training health professionals as a stand-alone intervention did not produce statistically significant increases in initiation prevalence.

• Women's knowledge and attitudes about breastfeeding were significantly improved by the training of health professionals as part of a health sector initiative package. A five-year programme which included training of health professionals reported small increases in initiation of breastfeeding, but these were not proved to be statistically significant.

- There is limited evidence to show that intensive lactation training courses for health professionals alone can have an effect on breastfeeding initiation prevalence. A package of interventions including training, however, may be more likely to influence attitudes and promote breastfeeding.

Social support from health professionals

Fairbank et al.[272] report on one UK-based RCT[281] which evaluated the effect of social support for socially disadvantaged women. This took the form of home visits and telephone calls by a midwife on hospital discharge. No significant difference was reported in initiation prevalence between the intervention and control groups. However, it is noted that this finding may have been influenced by the support received by some of the control group as 'standard care'. Feedback given by women was very positive and suggested that a midwife listening to them was important.

Peer support programmes

Findings from Fairbank et al [272]:

- Peer support programmes as standalone interventions have been shown to be effective in both the antenatal and postnatal periods, for women who expressed a wish to breastfeed but not for women who had decided to bottle-feed. This evidence is based on two trials (non-RCTs of good and fair quality respectively) in the UK and USA which targeted women on low incomes.

- More generally, three out of five effective WIC interventions with women on low incomes included a peer support programme. Peer support was also an integral part of three out of six effective multi-faceted interventions (see below).
- Qualitative research exploring why some women on low incomes do not want to breastfeed concluded that breastfeeding is a practical skill. The confidence and commitment to breastfeed successfully are best achieved by exposure to breastfeeding rather than talking or reading about it.

Media campaigns

Findings from Fairbank et al [272]:

- Local media campaigns (in one case TV) can be effective in improving attitudes towards breastfeeding.
- One study [282] showed an increase in initiation prevalence as a result of a hospital-based media campaign, although the age and methodological quality of the study limits its usefulness.

Multi-faceted interventions

Findings from Fairbank et al [272]:

- Multi-faceted interventions have been shown to increase initiation prevalence of breastfeeding. Five out of six effective multi-faceted interventions included a media campaign, in combination with health education programmes, training of health professionals and/or changes in government and hospital policies.
- Four out of six effective multi-faceted interventions included a peer support programme in combination with health education programmes, media programmes and/or legislative and structural changes to the healthcare sector.

Package of interventions: the Scandinavian Experience

In Scandinavia, where the initiation of breastfeeding prevalence has remained at around 98%, multi-faceted interventions have been implemented at a national level over the last 20 years. Four types of intervention that have contributed to the high levels of breastfeeding in Scandinavia are summarised below, as described in Fairbank et al [272].

However, it should be noted that there has been no evaluation to examine which, if any, of these aspects were more effective, or if all the combined package was necessary.

Interventions:

- An increase in problem-based information about breastfeeding, written mostly for and often by mothers, but read also by health workers. Consequently, more health workers also succeeded in breastfeeding their own babies.
- More mother-to-mother support groups, better management skills among health workers (and more workers with personal experience), and an increase in the collective sharing of

breastfeeding experience due to the rising numbers of women who have successfully breastfed.

- Increase in paid maternity leave with guaranteed return to previous employment.
- Maternity ward practices changed substantially towards mother-infant contact and autonomy.

6.6 Interventions to increase the duration of breastfeeding

Renfrew at al [283] did a systematic search to look at the effectiveness of public health interventions to promote the duration of breastfeeding. The authors concluded that the following interventions are likely to be effective /beneficial to extend breastfeeding duration.

- Skilled breastfeeding support, either peer or professional, proactively offered to women who want to breastfeed [284],.
- Preventing the provision of discharge packs containing formula feeding information and samples [285].
- Unrestricted feeding from birth onwards [286].
- Unrestricted skin-to-skin contact from birth onwards [286].
- Avoiding supplementary fluids for babies unless medically indicated[287].
- Regular breast drainage/ continued breastfeeding for mastitis [286].
- Antibiotics for infective mastitis[286].
- Skilled breastfeeding support, peer or professional [288].

Moreover, the following interventions appear to be promising for extending breastfeeding, well grounded in theory, and with some research to substantiate.

- Group, interactive, culture-specific education session [276]
- Group education session on positioning and attachment[289]
- Basing prevention and treatment of sore nipples on principles of positioning and attachment [289].
- Cabbage leaves/ extract for treatment of engorgement[290].
- Systemic antibiotics for infected nipples[291].
- Not separating mothers and babies for treatment of jaundice[286].
- Self-monitoring daily log for women from higher socio-economic groups[292].
- Combination of supportive care, teaching breastfeeding techniques, rest and reassurance for women with "insufficient milk" [286].
- National policy of encouraging maternity units to adhere to the UNICEF Baby-Friendly Initiative[293].
- Regionally/ nationally determined targets with supporting activities, and / or penalties and / or incentives [294].
- Tailored antenatal education, combined with proactive postnatal support in hospital and community, and with breastfeeding education for staff [295] .
- Combining antenatal education with partner support, postnatal support and incentives for women in low-income groups [296].

6.7 Transferability to the Taiwanese local situation

The acceptability and transferability of the effects of the interventions mentioned above to Taiwan may vary. It is prudent to say that it requires a lot of extra time and effort to implement most of these interventions in Taiwan and any one individual intervention is unlikely to work effectively..

For example, most of the education programmes in Taiwan are still run with large audiences and in a lecture format. Small and informal discuss-based education sessions may be difficult to implement in the current situation, due to extra financial and personnel resources needed. Furthermore, to encourage baby-led feeding needs 24-hr room-in in hospital and education of mothers and perhaps their families and hence requires lots of additional resources to do it properly.

A further example is that treating infective mastitis with antibiotics is a good practice, and it needs more education for health professionals to achieve it. Many doctors still consider mastitis is a contra-indication to breastfeeding. It requires much time and extra resources to change this concept and their practice.

Considering the current situation in Taiwan, to establish the network of social support from either health professionals or lay persons still needs much time and great inputs because the society does not have much existing infrastructure to provide this support. As to the use of mass media, the Bureau of Public Health in Taiwan has launched a short cartoon advert broadcasted in one government owned channel. However, the advert does not appear to be interesting, and being broadcasted in the daytime is difficult to reach for much of its target audience.

Since breastfeeding promotion in Taiwan has started relatively recently, the needs to educate the public and health professionals are tremendous, and it needs time and efforts to take the aforementioned interventions on board.

7. Rationale of the study

As described previously, breastfeeding promotion in Taiwan has been launched in the recent 7 to 8 years with a strong health professionals' orientation. There was a lack of understanding of women's perspective on breastfeeding both during hospitalisation and also after discharge. There was also a knowledge gap about the factors influencing women's breastfeeding behaviour and the directions of influence on them. This study aimed to address these gaps.

7.1 Aim

- The overall aim of this study was to build an understanding of the factors, determinants and correlates of breastfeeding behaviour of women in Taiwan.
- The aim of the qualitative study was to explore women's attitudes and experiences around childbirth, before and after discharge, and moreover to explore women's breastfeeding experience beyond 3 months. Issues relevant to breastfeeding were the focus, and we also aimed to collect background information to build the understanding of women's postpartum life. Also, it was intended to build a deeper understanding of the issues that it is not possible to present properly by quantitative means.
- The aim of the quantitative study was to investigate the factors that were shown to be important during the qualitative phase. It was also to examine the magnitudes and the directions of the effect of these factors on breastfeeding at discharge, and 3 months; as well as the increase, decrease of breastfeeding and continuation of feeding behaviour.

7.2 Outline of Approach

The aim was approached using qualitative and quantitative methods. The former covered three separate groups of women, which are described later. The latter method took the form of a questionnaire survey with follow-up among a sample of recently delivered women before discharge and at 3-months.

7.3 Developing and conducting research

Introduction

The first stage of the qualitative work was exploratory, with an open-minded approach using semi-structured interviews (interview A). After this preliminary work to define initial questions, topics for a structured questionnaire were developed, and applied to the first quantitative sample in Survey 1. This questionnaire (not shown) was reviewed by local experts (one nursing professor, one paediatrician, one head nurse in the study hospital and one medical sociologist) and piloted with 48 women.

Despite getting prior local ethical permission, the results from the survey provoked considerable concern that the questions and preliminary results indicated some aspects of user dissatisfaction with hospital services and were perceived not to be acceptable to the local professional community, thus raising opposition when a preliminary report was made. I was instructed that the results were not acceptable and could not be used. In order to carry out the study, I had further discussions with other local experts (one social scientist and one lawyer)

and accepted that further work would be under the oversight of leading clinicians. As a result of this I had to re-phrase 3 questions in survey 1, though the others remained largely unchanged. The adapted questionnaire (with frequencies of responses) is shown in Appendix 4.

At this stage, the SARS epidemic began and all clinical and hospital-based research was prohibited. A second survey questionnaire was developed during this time bringing more complete issues from interview A into account, except the unacceptable topics were not included. Because of the prior validation of the first questionnaire and the SARS interruption, this second questionnaire was not piloted again, and was used in a second survey. The previous local ethical approval covered the second version. All participants in both surveys were informed of the purpose of the study before participation, and a consent form with explanation was signed by each woman before the first interview (appendix 5). This study had ethical approval from the London School of Hygiene and Tropical Medicine and study hospital's ethical committee.

Table 7.1: Summary of phases of study

Phase of study	Dates	Sampling
Interview A	Dec '02 - Apr '03	25 women, recruited in hospital on nurses' account of intention to breastfeed. Interviewed face-to-face before discharge, 1 and 3 month postpartum (before discharge) and telephone interview (1& 3 months later).
Interview B	Mar-May & Aug-Dec '03	14 women approached by snowball sampling. Intended to recruit women who breastfed for more than 6 months.
Survey 2	Sep'03 –May '04	504 women recruited in 2 hospitals during the study period. Surveys were done before discharge (face-to-face) and 3 months postpartum (telephone).
Interview C	Nov'03- Aug '04	12 women, approached by snowball sampling. Intended to recruit women with diverse backgrounds.

Since the qualitative interview A and survey 2 only studied the period from hospitalisation to 3 month postpartum, there was a lack of understanding of events occurring after 3 months. Interview B aimed to explore the breastfeeding experience of those with any breastfeeding for more than 3 months. While conducting content analysis of the qualitative interviews, I found it important to explore more about the traditional practice during the confinement period, which has strong influence on women's behaviour during the first month postpartum. Interview C was therefore carried out to fill this gap. The time frame of field activity is shown below. These interviews followed similar consent procedure and the consent form is shown in appendix 6-8.

Table 7.2: Time frame of different stages of the study

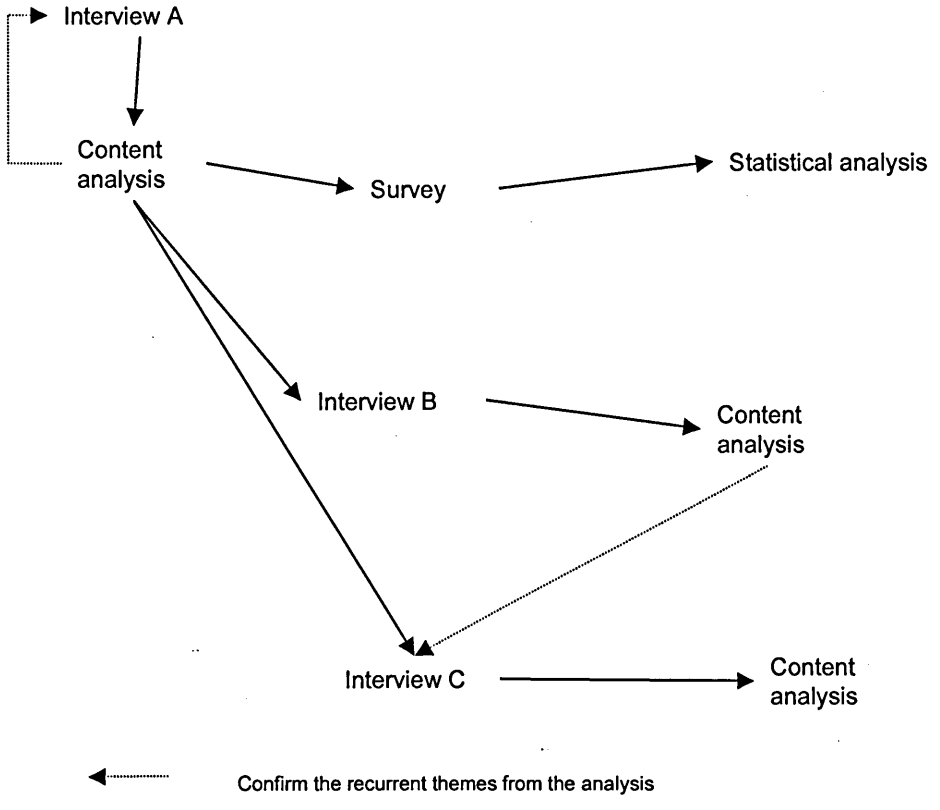
Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Interview A	----------	----------																			
Survey 1*			---------																		
SARS					XXXXXXXXXXXX																
Survey 2**											----------	----------	----------	----------	----------	----------	----------	----------			
Interview B				----------					----------	----------	----------										
Interview C																					

*Results of Survey1: not shown in this document.
**Survey 2 will be renamed to simply as "the survey" in the rest of this document.

Interrelation between the different modules of the study

The first series of interviews was the qualitative phase with 25 women interviewed in hospital, and then 1 and 3 months postpartum at home by telephone, using semi-structured interviews (interview A, see Appendix1-3 for the topics of the interview). The questions of the structured questionnaire for the survey were based on the findings of interview A. I initially recruited 508 women and 504 (99.2%) women completed this survey. The four missing women were lost at 3 months and their results are not included in analysis. The quantitative interviews were face-to-face during hospitalisation and by telephone at 3 months postpartum. The findings of interview A had very limited content about women's breastfeeding experience at 3 months since the majority of them gave up by the first month (details presented later). So, I had effectively no information about women's breastfeeding experience beyond 3 month after birth. I therefore approached 14 breastfeeding women by snowball sampling using an in-depth open interview (interview B) to explore their breastfeeding experience. In all these interviews, the strong influence of traditional practice was found to be significant, especially during the first month, for some of the women. This issue had not been adequately explored among group A women due to the nature of the interview objectives at the time and of the group itself, so I then interviewed 12 women from various backgrounds, to obtain more information about traditional practice during the confinement and its influence on infant feeding behaviour (interview C). The sequence of interviews is shown in Fig 7.1.

Fig 7.1: Source of information in the study and their inter-relationships



7.4 The rationale for combining qualitative and quantitative methods

The primary aim of this study (see above) was to explore and detect factors influencing women's infant feeding behaviour. The background of low breastfeeding prevalence in Taiwan is multi-factorial, and includes many areas where their effects were previously not studied. There was therefore a need to build up understanding in stages and arrive at further questions as this understanding grew. As pointed out by Miles& Humberman [297] "this uncovering and explicating is typically based on successive observations and interviews, which are reviewed analytically to guide the next move in the field. "

Qualitative and quantitative interviews are complementary, and where appropriate should be combined to maximize the strengths and minimise the limitation of each. Also, the qualitative work adds strength of evidence when generalizing the results and assessing the importance of the various factors in terms of their frequency of occurrence.

How the flow of information concerning issues of interest was assessed in the qualitative study.

The following criteria were used to gauge the importance of the various topics and issues in the qualitative interviews:

- How often a specific topic or issue appeared in the spontaneous narratives of the women,

and contrasts between different narratives.

- How the spontaneous narratives confirmed themselves at different times and contributed to the overall understanding of the topics.
- In the later analysis stage, how the information and conclusion were validated and corroborated by results from the other sets of interviews and from the structured phase.

7.5 Methods in the Qualitative study

Introduction:

There were three stages of the qualitative study, as summarised above. Interview A employed semi-structured interview with a list of topics to talk about. This list was not piloted but was validated by local expertise (one medical sociologist, 1 psychologist and 1 professor in domestic economics). The interviews were conducted consistently following the topics.

Stage A: Serial semi-structured interviews with women from hospitalisation to 3 months postpartum

Objectives

To explore the factors that are influential and related to women's breastfeeding behaviours in hospitals and after discharge; to identify the sources of information regarding infant feeding, and how their significant others' attitudes affect feeding behaviour.

Subjects

Healthy mothers with uncomplicated birth, having healthy term singletons were recruited in two hospitals in north Taiwan and the survey was conducted in the same hospitals. I interviewed according to the topics in Appendix 1-3, following the women's narratives for setting up themes, and adding more till saturation was reached; saturation implying that further subjects were recruited and interviewed until no new themes emerged [298].

Setting

The subjects were recruited in the maternity wards in the two hospitals. These hospitals are homogenous since they have shared staff and similar maternity ward policies. In 2004, both of them had in average 60-70 births per month [299]. I conducted the survey in the same hospitals (see later).

Interviewing

As the overall breastfeeding prevalence was low in Taiwan, I recruited women on nurses' account of intention to breastfeed. Midwife opinion was not possible because the limited midwifery service of Taiwan is not accessible to the vast majority. I introduced myself as a researcher and invited the women's participation. The drafts of interview topics were reviewed and validated by two local experts and piloted on one woman during hospitalisation and one at 2 months postpartum. Their information was not included because three topics

were re-worded after this pilot. Written consents (appendix 6) were signed prior to the first face-to-face interview.

For the first interview in hospital, women decided if they wished to be interviewed alone or with companions. All but one (A01, see table8.2) preferred to be interviewed alone.

I rang up to arrange the second interview about one week before the first month post-discharge. Since that was just at the end of the first month confinement (*"tso yueh tzu"*), I had some difficulties tracing the women and arranging interviews. Some women had left where they usually lived and went to their own parents' (or parents-in-law's) home during the confinement. The majority preferred telephone interviews because they were away from the city, or they (and / or their family) felt that it is not appropriate to have a guest during confinement. Those who decided to have a face-to-face interview (A14 & A25), chose the place and time of interview, and both of them choose to be interviewed at home. I was unable to trace one woman at the first month because she had moved to her parents' home in a remote mountain area and came back after 2 months but refused a further interview; another felt uncomfortable talking about breastfeeding and withdrew from the study. Both of their earlier data were excluded because they both wanted their narratives to be excluded from the analyses and final reports.

All the other women came back to where they usually lived before childbirth by the end of the 3rd month postpartum. All of them had a telephone interview at 3 months.

All interviews were audio taped and transcribed, in Chinese, after each interview.

Stage B: Unstructured interviews with breastfeeding women

While conducting stage A interview and the abandoned survey, I found that the informants in stage A were predominately mixed feeders at discharge and formula feeders at 3 months. Moreover, there was no information beyond three months after birth, and consequently, a lack of understanding of breastfeeding women's experience and their lives beyond 3 months. In order to overcome these limitations, stage B was undertaken.

Objectives of this stage

To understand the life events that occur during the early days after childbirth and the postpartum period among women who breastfeed in greater quantity and for longer period of time.

Subjects

LL (B09), a mother breastfeeding her second child and the leader of a women's reading club in Taipei, was the key informant of this stage. I approached a group of breastfeeding women by snowball sampling through LL and other women I interviewed. Ten women lived around Taipei area, two in Hsinchu and one in Taichung. All of them were breastfeeding at the time of interview. The details of these interviewees are listed in table 8.4.

I interviewed as many women as necessary until there was no new emerging theme coming up. Due to the limitation of the nature of snowball sampling, it is unlikely to reach saturation in the sense of covering all views etc in the population, due to the homogeneity of this group and this is a limitation that is accepted [298]. They gave birth in various hospitals; some of these hospitals are not recognised as baby-friendly hospitals by the local authority and some are.

Interviewing

I used open interviews in order to explore women's breastfeeding experience widely,

After introducing myself and obtaining oral consent by telephone, face-to-face interviews were carried out. Written consent was signed before the commencement of the interview (appendix 7).

Women chose the place and time of interviews; some of the interviews were conducted at their homes and some in cafés or restaurants. Repeated interviews were conducted either face-to-face or by telephone if there were topics needed more clarification.

All interviews were tape-recorded and transcribed in Chinese.

Stage C: Traditional practice *("tso yueh tzu")*

During the process of stage A and B, themes concerning traditional practice were frequently mentioned and the effects of these on puerperal women's life seemed quite significant. In order to explore the tradition during confinement in the Taiwan society, there was a need to talk about this subject more extensively. However, it was inappropriate to add this dimension into stage B since that stage was approaching its end. Moreover, it would be more informative to get narratives on this subject from women from a wider rage of backgrounds like age and education.

Objectives of this stage

To explore the perceived effects of traditional practice and its effect on women's postpartum life, especially its impact on infant feeding.

Subjects

I started with two informants: C06 and C08 and included women with as wide variety of background and age as possible so that purpose sampling was employed [298] by women introducing their friends and/ or relatives to me.

Interviewing

I approached 14 women and 12 agreed to participate.

I used open interviews in order to explore the women's ideas and experiences more broadly.

After obtaining oral consent by telephone, face-to-face interviews were carried out. Written consent (appendix 8) was signed before the commencement of each interview.

Women chose the place and time of interviews, some of the interviews were conducted at their homes and some were in cafés or restaurants. Repeated interview was conducted either face-to-face or by telephone if there were topics needed clarification. All interviews were tape-recorded and transcribed in Chinese.

7.6 Data analysis of the qualitative phase

Data entry and processing the data

Data from the interviews of all three stages were transcribed onto computer using an ordinary word processor. After reading the complete transcripts, items of information were identified and labelled by key words, and the information classified. Information pertaining to the topics and research questions of interest was identified using the key words. Summaries were used to establish patterns, themes, tendencies that emerged from the data. Interpretation and search for explanations were part of the on going process within these continuous analyses. Linkages between categories and notions about causes and consequences including hypotheses about the relationship between processes and were generated in the course of content analysis. .

Data analysis

After completing the first few interviews, I started to analyse the transcripts. The stages of analysis are described below [297].

Familiarisation

Soon after each interview, I listened to the tape to ensure the quality of recording, to familiarise myself with the data, and to record the thoughts and observations [300]. This was particularly important for noticing pauses, intonation, recalling non-verbal communication like posture and commenting on the atmosphere and the ease or difficulty of the interview [301].

Identifying a thematic framework

After pilot interviews, familiarisation with the data resulted in an initial list of key themes and categories (table 7.3) and revision of the initial interviewing schedule. The thematic framework is similar to the interview guide (Appendix 1-3) [300, 301].

Table 7.3: Categorisation of the themes identified by the qualitative study.

Category	Theme
Socio-demographic	♦ Education ♦ Family type ♦ Previous feeding history
Source of information	♦ Prepartum - Mother-in-law - Friends and relatives - Books - Internet - Health professionals and hospital run antenatal education - Commercial promotional materials and company funded antennal education.
Source of information	♦ Postpartum - Mother-in-law - Friends and relatives - Books - Internet - Health professionals ♦ Company personnel
Prepartum	♦ Timing of intention formation ♦ Antenatal education
Intrapartum	♦ Mode of birth ♦ Birth experience ♦ Intrapartum interventions
Postpartum	♦ Immediate skin contact ♦ Room-in ♦ Separation ♦ Physical conditions

Coding

I applied a systematic coding method by giving similar themes the same number. Using Microsoft Word, I was able to quickly locate areas of transcripts with the same number.

Content analysis

Content analysis was conducted in three major steps [297]. The first stage was data reduction, then data display and finally the drawing and verification of conclusions. This process is illustrated by examples in Table 7.4

Table 7.4: Three major steps of content analysis; examples

Data reduction	Data display	Conclusion
"I remember when I was a little girl, and my mother told me how my brother and I was born, she told me that the doctor would use a scissor to cut the vagina, so that the baby can be delivered.... did not have a second thought when I had episiotomy, every woman needs one if she is to give birth vaginally."(A25)	Birth stories mentioning certain interventions, in this case episiotomy, are passed on by the word of mouth. Consequently, most women take it for granted when they receive the interventions.	Episiotomy was performed decades ago and people still justify its use despite more recent evidence opposing its routine use.
"It (episiotomy wound) hurts, you know. But I am too shy to tell my doctor. I sit in a funny way, mmn ~ I have to avoid sitting up only when it is absolutely necessary" (A23)	The wound of episiotomy makes woman uncomfortable, and feeling embarrassed when request assistance.	Medical interventions during birth affect women's ability to conduct daily activity in the early days.
"I had infection...I went back one week later and told him (doctor) that I still feel uncomfortable, he replied again that it is not a problem, he did the stitches well... I could not sit normally till now (I month) and forget about breastfeeding. I cannot sit, how can I breastfeed though I wanted to!" (A20)	Doctor's ignorance leads to complication and further compromises woman's ability to act according to her own will.	Without appropriate care, the effects of interventions during birth can remain influential after 1 month.

Data reduction

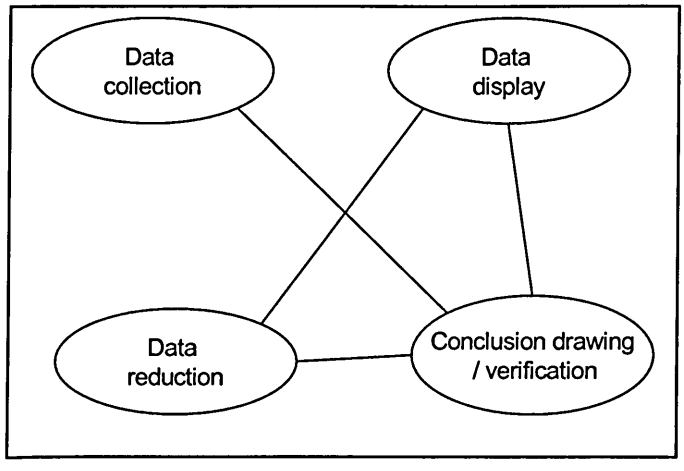
The first column shows the initial process of selecting and simplifying data from the raw material. The objective of this manipulation is to generate patterns of description representing areas or topics of this prime interest [300].

Data display

The step of data display is to organize and assemble information so that conclusions and interpretations can be drawn [301]. The main form of display used was a matrix, with two more statements, representing issues or factors of interest, crossed one against the other to allow for interactions and other relations to be detected [300].

Conclusion drawing and verification

Figure 7.2: the interrelations between the components of data analysis [297].



This process is to detect different patterns, looking for similarities and contrasts among the verbal categories used by informants. The search for interpretation here includes the search of interrelations and causal flow. Actually, this process of interpreting data and finding relationships can send us back to the raw data where the process of searching, classifying and drawing conclusions can start over and over again, with information analysed and results generated using a continuous process on a circular system [297].

Constant comparison

In order to carry out cross-case analysis when applicable in this study, the constant comparison method was employed. According to Goetz and LeCompte [302] this method "combines inductive category coding with a simultaneous comparison of all social incidents observed (p. 58). As social phenomena are recorded and classified, they are also compared across categories. Thus, hypothesis generation (relationship discovery) begins with the analysis of initial observations. This process undergoes continuous refinement throughout the data collection and analysis process, continuously feeding back into the process of category coding. "As events are constantly compared with previous events, new topological dimensions, as well as new relationships, may be discovered" [302] (p.58).

Validity of qualitative methodologies

Rigorously conducted qualitative research is based on explicit sampling strategies, systematic analysis of data, and a commitment to examining counter explanations. Ideally, methods should be transparent, allowing the reader to assess the validity and the extent to which results might be applicable in their own context. The generalisability of qualitative research is likely to be conceptual rather than numerical [303]. The sampling, interviewing, with the methods of analysis in this study are fully detailed above and meet these criteria

7.7 Quantitative study

Objectives of this stage:

To estimate the effect of the qualitative content, the extent of correlation between the significant factors and directions of breastfeeding behaviour, and the women's characteristic in hospital settings.

Setting:

This survey was conducted in two hospitals in north Taiwan. These two hospitals had similar routine and were run by the shared staff. Both of them had average 60-70 births per month; moreover, the annual average CS rate was 33.8% in one hospital and 35.5% in the other in 2003 [304].

Subjects:

I aimed to recruit healthy women who gave birth to healthy, full-term singleton infant without overt obstetric complications. Women with underlying medical condition, who gave birth prior to 37-week gestation, had babies <2500g or developed complications after birth were excluded from this study.

Determination of sample size

A sample size of 500 was considered logistically feasible to recruit and allow for loss of follow-up. This sample size was assessed for the outcomes, initiation and continuation of exclusive breastfeeding before discharge and mixed feeding at 3 month postpartum. The prevalence of these was taken as approximately 20% (formula and breastfeeding group ratio 4:1). As the determinants or risk factors were not yet specified, a range of prevalence for a factor with two levels (present or absent, etc) are considered for three possible values of the odds ratio. The standard sample size determination using Epi-Info6.0 is applied with 80.0% power and a 5.0% significant level. The calculated results are as in table 8.5.

Table 7.5: Sample size required detecting odds ratios of 2.0, 2.5 or 3.0 between formula feeding and breastfeeding groups, with 95.00% confidence interval and power at 80.0%

Risk factor prevalence in formula feeders (%)	OR = 2.0		OR = 2.5		OR = 3.0	
	Risk factor prevalence in breast feeders (%)	sample size	Risk factor prevalence in breast feeders (%)	sample size	Risk factor prevalence in breast feeders (%)	sample size
20	33	555	38	310	43	210
30	45	465	52	265	56	190
40	57	445	62	265	67	190
50	67	465	71	280	75	205
60	75	525	79	325	82	245
70	82	650	85	330	87	315

The proposed sample size is adequate for risk factors in the middle range of prevalence at OR= 2, and is adequate for prevalence of 20% to 70% for OR=2.5 and 3. Although no preliminary data were available, odds ratios of several risk factors were calculated from the literature. According to Hung et al [204], the influence from husband had an OR of 3.1, and health professionals and media had OR= 0.3 and 0.2 respectively, for Chinese immigrants in Australia [146], which are equivalent to 3.3 and 5 for sample size purposes. Other factors like bonding had OR= 3.1. Other significant factors such as perceived insufficient milk (OR=0.3), breastfeeding restricts mother's ability to follow traditional Chinese foods (OR=0.3) and fat baby is a healthy baby (OR=0.2) were also explored. This all suggests that there are important factors with quite strong influence that a sample size of 500 would be adequate to detect.

Data collection:

It was mentioned before that the prohibited survey was validated and piloted among 48 women. However, the subsequent survey questionnaires (Appendix 1-3) did not go through this process due to its similarity to the original questionnaire and to the fact that the SARS epidemic effectively shortened the available time. Moreover, the clinicians in the study sites became less cooperative after the presentation of the initial findings and they suggested I start with the full scale survey straight with no repeated pilot. Since only 3 questions were changed from the initial questionnaires and format of the survey was identical, it is unlikely to alter the validity of this survey.

The in-hospital structured interview (see Appendix 1-3 for questionnaire) was conducted fact-to-face during the hospital stay by interviewers. Women generally stay in hospital for 3 days for uncomplicated vaginal birth, and 5 days for caesarean section (CS). The postpartum questionnaire was completed by telephone interview at about 3 month postpartum. Women were interviewed by either of the two researchers (CWL, FSC) in hospital, and were interviewed by the same person after discharge. One of the researchers (CWL) worked in both of the hospitals from Monday to Saturday afternoon as full-time researcher, Another (FSC) helped with interview when CWL's interview schedule was not able to cover those who were about to discharge soon from one of the hospitals. Those who gave birth on Sundays were interviewed on the following Mondays or Tuesdays, Rapid discharge is rare in the Taiwanese health system and we managed to interview all the Sunday births during the

research period in these following days. We approached 509 women; all of them consented to participate this study at first contact, one refused at the first interview due to perceived family pressure. We lost 4 women for the 3-month follow up interview due to their temporary movement; after contacting them, they all expressed the wish not to participate any more and wanted their information of the first interview excluded. Altogether, we collected complete data set from 504 (99%) women.

Data entry:

All questionnaires were double checked by CWL and FSC before data entry. CWL was primarily responsible for data entry. All information was entered using Excel and transferred to STATA 8.0. A random proportion of the entered data were checked against the questionnaires.

Data analysis:

The data were analysed using STATA software. The main techniques used were tabulation and logistic regression.

7.8 Justification of methodology

Breastfeeding is a complex behaviour and breastfeeding promotion is a complex intervention [266] bearing on behaviours, parameters of the behaviour (e.g. timing, frequency, duration), and methods of organising and delivering the promotion of desired behaviours (promotion and delivery of information, influence of nurses, doctors, health visitors). There is evidence that the "10 steps to successful breastfeeding" [170], the prototype that WHO/UNICEF have been promoting globally for a decade, are effective in promoting breastfeeding, yet the Taiwan local initiative is different in several respects, has been insufficiently studied, and there is a current knowledge gap.

Qualitative methods were employed because of this gap. Interviewing and participant observation are two of the principal methods of data collection in qualitative research [267, 268], with triangulation and a multidisciplinary approach using different methods and sources of data increasing the reliability and validity of this research [269, 270]. Qualitative methods enable one to be open to the unexpected. The objectives of this study focus on individual experiences and choices of individual women and health professionals, and the in-depth interview is an appropriate method of data collection [271].

At all stages of the study, the respondents were postpartum women; it was not possible to have group interview with those who are supposed to be confined at home for a period,. However, to add contextual detail and explore ranges and norms for attitudes, beliefs and behaviour in clinical settings, focus groups of junior nurses were considered appropriate for gathering data. During the process of discussion in these groups, the researcher was able to observe the process of consensus and disagreement and this contributed important information in the context [267, 268, 271]. Feeding behaviour initiates mostly inside hospitals and it is evident that institutional practice influences this initiation. Participant observation enabled the researcher to gain understanding of typical practices here, and draw a

clearer picture of the whole issue. The numbers of interviewees and focus groups was to be determined according to the principle of saturation [268, 270, 271].

7.9 Statistical Methods

Logistic Regression

In the quantitative part of this study, I used logistic regression to analyse the relationships between exposures and the outcomes of interest (any breastfeeding at discharge and 3 months, decrease, unchanged and increase of breastfeeding). In this case, linear regression is not appropriate.

When fitting statistical models, the log odds of the outcome is commonly used. The reason for modelling the log odds rather than risk or odds is that the log odds can take any value, positive or negative, whereas the risks are constrained to lie between 0 and 1. When using statistical models it is easier to model a quantity which is unconstrained than one which is constrained. This avoids the possibility of predicting impossible values from the model.

Modelling log odds is referred to as "logistic regression" and the relationship between outcome and exposure in log scale is:

Log (odds in the exposed) = Log (odds in the unexposed) + Log (odds ratio).

Confounding

A confounder is an extraneous factor that wholly or partially accounts for the observed effect of the exposure on outcome status. The "effect" here could be either an apparent relationship or an apparent lack of relationship. When there is confounding the underlying odds ratio for the various levels of the confounder are all the same, and this common value is different from the odds ratio when the confounding variable is ignored. The degree of confounding may be much more marginal or less consistent across the sub-tables, and confounding is more likely to lead to underestimate or overestimate of an effect, unless it is adjusted for [305].

Identification of confounders

A confounder must:

- Be related to the outcome, but not be a consequence of the outcome.
- Be related to the exposure, but not be the consequence of the exposure.

The choice to test of confounders depends both upon data-based observed relationships and a priori knowledge of the supposed biological or social process at work. Adjustment for confounders is achieved through logistic modelling by fitting the confounder with and without the exposure. Comparison of the ORs, for the model with the confounder against the model confounder plus the exposure gives an indication of whether the exposure is still important after allowing for the confounder. There is no formal significance test to see whether or not a potential confounder is truly a confounder: it is not entirely a statistical issue

but an epidemiological one. However, we could reasonably conclude no confounding in the study if the OR, unadjusted and adjusted, are very similar [306].

Interaction:

Interactions occur between two risk factors when the effect of one risk factor upon disease is different at (at least some) different levels (outcome, strata) of the second risk factor. Hence the equivalent term, effect modification. When there is no interaction the effects of each of the risk factors are homogenous across the levels of the other risk factor.

There are three types of interaction [306]:

- Antagonism: the effect of risk factor A works in opposite direction when acting in the presence of exposure, to the direction in which it acts in the absence of exposure, to risk factor B. It presents a reverse effect.
- Synergism: the effect of risk factor A is in the same direction, but stronger in the presence of B.
- Unilateralism: A has no effect in the absence of B, but a considerable effect when B is present.

Which interaction to test

In this study, there are many potential risk factors influencing breastfeeding behaviour, and many possible interactions can be investigated. I have to be aware of false positives when many hypothesis tests are carried out in order to trawl for interactions: with 5% significance tests one expects to wrongly reject the hypothesis of no interaction 5 times in 100. Furthermore, high-order interactions are difficult to interpret. Hence, it is reasonable to restrict investigation of two-way interactions. Moreover, there may be unreasonable work concerned with testing two-way interactions for all variables [306]. In this study, I only test interactions with a *priori* hypothesis. When there is an interaction, I will report stratum specific OR so that the readers can have a clear understanding how the effect differs across different strata [305].

8. Results of qualitative study

8.1 Introduction

I will present the background information for stage A, B and C in this section, and in-depth findings in later sections. Since the results of stage C which is to explore the relationships between traditional practice and breastfeeding provided us the background understanding of this issue, we will present the qualitative findings of traditional practice first, then go onto the factors influencing women's breastfeeding behaviour.

8.2 Background information

Stage A

To explore breastfeeding experience, I approached 27 women identified as potential breastfeeders by the nursing staff. Two refused. Their narratives were obtained by semi-structured questionnaire (see Appendix 1-3). The details were described in the previous chapter (8.7).

The mean age was 28.8 (range: 24-36 years) and the mode of their education level was university/college (36%). Eight out of 25 (32%) women gave birth by CS, which is about the national average. Most of them (72%) gave birth to their first child and the mean of number of offspring is 1.32, which is close to the national average (1.25) and the Taipei Metropolitan average (1.08). All interviews were tape recorded and transcribed subsequently. The definitions of different feeding methods were defined as table 8.1.

Table 8.1: Definition of breastfeeding outcomes (modified from [4])

Term	Definition
Exclusive breastfeeding	Breastmilk is the baby's only source of caloric intake. Receive no water or any nutritive liquids.
Predominant breastfeeding	Breastmilk is the baby's major source of caloric intake. Receive some nutritive supplementation that has little protein and calories, e.g. juice or glucose water.
Mixed feeding	Baby receives both breastmilk and infant formula as source of energy.
Token breastfeeding	Baby receives little breastmilk and is not considered as source of energy.
Formula feeding	Baby receives no breastmilk, and infant formula is considered as the major source of energy.

In the quantitative survey (see later chapter), mixed feeding means predominant breastfeeding and mixed feeding, and formula feeding means token breastfeeding and formula feeding, as defined in table 8.1.

Table 8.2: Basic information of stage A informants

No.	Age	Occupation	Edu [a]	Type of birth [b]	Infant feeding behaviour [c]	No of child	Family type*
A01	24	Housewife	2	VB	MF at discharge and 1 mo. FF at 3 month.	1	1
A02	25	Teacher	4	VB	MF for 3 mo.	1	3
A03	25	Administrative assistant	3	VB	MF at discharge and 1 mo. FF at 3 mo.	1	3
A04	26	Engineer	4	VB	MF at discharge. PBF at 1 and 3 mo.	1	3
A05	26	Freelancer	5	CS	MF at discharge. PBF at 1 and 3 mo.	1	3
A06	26	Housewife	3	VB	Token BF at discharge. FF at 1 & 3 mo.	3	1
A07	27	Cook	2	CS	Token BF at discharge. FF at 1 & 3 mo.	2	2
A08	27	Student	5	VB	PBF at discharge. EBF at 1 & 3 mo.	1	3
A09	27	Hairdresser	2	CS	MF at discharge and 1 mo. FF at 3 mo.	2	2
A10	28	Administrative officer	4	VB	MF at discharge and 1 mo. FF at 3 mo.	1	3
A11	28	Photographer	4	VB	MF at discharge. FF at 1 and 3 mo.	1	2
A12	28	Teacher	4	CS	Token BF at discharge. FF at 1 & 3 mo.	1	1
A13	28	Research assistant	5	VB	MF at discharge. EBF at 1& 3 mo.	2	3
A14	29	Banking	4	VB	MF at discharge and 1 mo. Token BF at 3 mo.	1	3
A15	29	Nurse	3	CS	Token BF at discharge. FF at 1 & 3 mo	1	2
A16	29	Store keeper	2	CS	Token BF at discharge. FF at 1 & 3 mo	2	1
A17	30	Accountant	5	VB	PBF at discharge. EBF at 1 & 3 mo.	1	3
A18	30	Teaching assistant	4	VB	MF at discharge. PBF at 1 & 3 mo.	1	2
A19	30	Dancer	3	VB	MF at discharge. FF at 1 & 3 mo.	1	1
A20	31	Technician	3	VB	MF at discharge. Exclusive FF at 1 & 3 mo.	2	2
A21	32	Banking	4	CS	MF at discharge and 1 mo. Token BF at 3 mo.	1	3
A22	32	Neuro surgeon	4	CS	Token BF at discharge and 1 mo.FF at 3 mo	1	3
A23	32	Housewife	2	VB	PBF at discharge. EBF at 1 & 3 mo.	2	2
A24	34	Post officer	3	VB	MF at discharge and 1 mo. Token BF at 3 mo.	1	1
A25	36	Dietitian	5	VB	MF at discharge. Token BF at 1 & 3 mo.	1	3

a: ≤junior high(1),≤ senior high (2)Institute of technology(3), College/ University (4), Postgraduate(5)

b: CS(cesarean section); VB (vaginal birth).

C: FF: formula feeding. PBF: predominant breastfeeding. MF: mixed feeding. EBF: exclusive breastfeeding. BF: breastfeeding.

** 1: Extended: more than two generations. 2: Two generational. 3: Nuclear.*

Table 8.3: Summary of infant feeding behaviours of stage A informants

	Discharge*	1 month	3 months
Exclusive breastfeeding	0	12%	12%
Predominant breastfeeding	8%	12%	12%
Mixed feeding	68%	36%	8%
Token breastfeeding	24%	8%	16%
Formula feeding	0	32%	52%

*: Discharge means (for the majority), 3 days postpartum for those who had vaginal birth, and 5 days for those who had CS.

The number of women with exclusive and predominant breastfeeding increased after discharge and became stable at 1 month to 3 months; this increase in breastfeeding has also been found in the quantitative study. Though the number of mixed feeders declined from discharge to 3 months, the proportion of formula feeding increased from 0 to 52% from discharge to 3 months. There may have been some events during hospitalisation that hampered exclusive breastfeeding as the number increases from discharge to 1 month. That none of the women formula fed at discharge was due to the purposed sampling recruiting potential breastfeeders.

Stage B

I sought to interview women who had breastfeed for longer than 3 months and reunited them by snowball sampling as described above.

I successfully interviewed 13 women, their age ranged from 27-42 (32.71±3.83 years old) years old. Two of them were housewives, and ten of them were breastfeeding their first child. The education backgrounds ranged from Institute of technology to postgraduate, and eight (57.1%) of them were university/college graduates. Other details are shown in table 8.4 below.

This group of women tended to be more educated, and they also planned to breastfeed longer. A relationship between education level and any breastfeeding at 3 months was found by the survey (see later section).

Table 8.4: Basic information of stage B informants

No.	Age	Occupation	Edu[a]	Type of birth [b]	Breastfeeding condition [c]	Family type*
B01	27	Journalist	4	VB	BF with complementary feeds, baby is 7 mo old, no plan to wean.	3
B02	28	Accountant	4	VB	PMF for 6 mo, went onto MF† at 10 mo. Planning to wean.	1
B03	29	Housewife	3	CS	EBF, baby 5 mo.	3
B04	30	Software Engineer	5	VB	PBF for 6 mo and went onto MF, baby is 11 mo. BF a 3- year -old.	2
B05	31	Lawyer	4	VB	EBF, baby is 4.5 mo.	3
B06	32	Dentist	4	CS	EBF for 5.5 m. BF with complementary feeds, baby is 14 mo old, no plan to wean.	3
B07	32	Banking	4	VB	EBF for 5mo, went onto PBF at 6 mo. Also BF a 2-year-old.	2
B08	33	Associate professor	4	CS	EBF for 5 mo. Just started adding complementary foods at 6mo.	3
B09	34	Physiotherapist	5	CS	EBF from 0-5 mo, then MBF to 10 mo. Plan to wean at 12 mo.	2
B10	34	Social worker	4	VB	PBF for 6 mo. Also BF a 5-year-old.	3
B11	35	Art editor	3	VB	EBF from 0-6 mo, then MF to 11 mo.	3
B12	35	Housewife	3	CS	Did not BF 1st child (6-yr-old). PBF for 4 mo and plan to wean at 6 mo.	1
B13	36	Architecture	5	VB	EBF for 6 mo. Plan to continue to BF as long as her baby wants.	3
B14	42	Business Manager	4	VB	Did not BF her older children (8 & 5 yr-old). EBF her 3rd child for 6 mo, went onto MF.	3

a: ≤ junior high(1),≤ senior high (2)Institute of technology(3), College/ University (4), Postgraduate(5)
b: CS (caesarean section); VB (vaginal birth).
C: FF: formula feeding. PBF: predominant breastfeeding. MF†: mixed feeding; mixed feeding beyond 6 mo here means any breastfeeding plus complementary feeds. EBF: exclusive breastfeeding. BF: breastfeeding.
** 1: Extended: more than two generations. 2: Two generational. 3: Nuclear.*

Stage C

This stage included 12 women to explore their experiences and knowledge about the tradition of the first month postpartum, and issues related to breastfeeding. Their ages ranged from 25-86 years old, which covers a considerable time span and is considered adequate to explore the traditional practice. Woman C02 had her most recent birth 2 years ago, C01 3 years ago

and rest had their most recent births ranging from 4-55 years ago. The details of each interviewee are shown as table 8.5. As many women gave birth a long time ago and were not able to recall the feeding practice correctly, we roughly classified them into formula feeding, mixed feeding and breastfeeding groups. The latter means any breastfeeding otherwise the same definition as stage A was applied.

Table 8.5: Basic information of interviewees in stage C

No.	Age	Occupation	Edu[a]	Ethnic origin╫	Birth[b]	No of offspring	Feeding method[c]	Family type*	Location during confinement	Major caregiver
C01	25	Banking	3	H	CS	1	FF	3	Own mom's home	Own mother
C02	27	Teacher	2	M	VB	1	MF	1	Mother-in-law's home	Mother-in-law
C03	29	Housewife	3	M	CS	2	FF	2	Own mom's home	Own mother
C04	32	Housewife	4	C	VB	1	FF	2	Mother-in-law's home	Servants
C05	44	Accountant	2	M	VB	2	FF	2	Mother-in-law's home	Mother-in-law
C06	46	Banking	4	M	CS	3	BF	3	Own home	Own mother
C07	50	Banking	2	H	VB	3	FF	2	Mother-in-law's home	Mother-in-law
C08	53	Business	4	C	CS	1	BF	3	Own home	Own mother
C09	61	Teacher	4	M	VB	2	MF	3	Own home	Own aunt
C10	65	Teacher	4	M	VB	2	BF	3	Own home	Partner Self
C11	71	Housewife	3	M	VB	3	MF	3	Own home	Partner Self
C12	86	Housewife	2	M	VB	1	BF	2	Mother-in-law's home	Mother-in-law

a: ≤junior high(1),≤ senior high (2)Institute of technology(3), College/ University (4), Postgraduate (5)
b: CS(cesarean section); VB (vaginal birth).
c. FF: formula feeding. MF: mixed feeding. BF: breastfeeding.
╫: H: hakka. M: Minan. C: Mandarin.
p.s. :Mandarin, Minan and Hakka are three major ethnic groups in Taiwan, and they have quite similar concepts about the confinement[192].
** 1: Extended: more than two generations. 2: Two generational. 3: Nuclear.*

8.3 Results: Traditional practice

Introduction

This stage was conducted later in the field work, but the findings are presented first for the following reasons:

1. There is anecdotal information showing that many health professionals and breastfeeding women perceived that the traditional practice is harmful to breastfeeding. How and why the tradition can be reported as harmful is outside the scope of this study, but this stage provides a background understanding of the tradition.
2. Some of the common themes mentioned by the stage A& B interviewees were related to the tradition. Given the objectives of these two stages, the information related to the traditional practice was not extensively studied. It would be helpful to the readers who have limited prior understanding of Chinese tradition to grasp and interpret the findings of stage A&B by presenting the findings of stage C first.
3. The results of this stage provide the basic pictures of many postpartum women's life during the first months.

The data covered a wide scope of aspects of traditional practice but we focus on issues related to infant feeding in this document.

Summary of the findings

A. Dietary regulations during the first month postpartum:

A woman's body becomes imbalanced due to pregnancy and childbirth and that makes her prone to all sorts of illness. Therefore, it is very crucial to restore the status of imbalance and increase immunity. According to the tradition, people can use "hot" and "replenishing" types of foods to help women to restore their pre-pregnant status. Table 8.6 enlists the foods that were encouraged and restricted to consume reported by the interviewees.

1. Foods that are allowed:

   According to the interviewees, consuming "hot" and "replenishing" (*pu*) foods is good for health. They are as following categories:

   a. Hot, high protein foods
   b. Sesame oil, ginger, and alcohol
   c. *Fa-Nai* (milk enhancing) foods
   d. Vegetables and fruits

2. Foods that should be avoided (see table below)

   Postpartum women are "weak" and "retain extra fluid", therefore, it is important to avoid foods that may damage health. They fall in the following categories:

   a. Hard foods (e.g. chickenpeas)
   b. Gassy foods

c. Salt

d. Water

3. Therapeutic foods:

Use of "hot" Chinese herbs helps to enhance one's "weak" body, and promote health. They are as follows:

a. Ordinary Chinese herbs

b. *Sheng-Hua* soup

B. Behavioural regulations during the first month postpartum

After giving birth, a woman's body is in a "weak-cold status", and it is particularly important to follow rules that are beneficial to her health. In order to promote her future health, it is vital to avoid anything that is prohibited traditionally.

1. Avoid wind, wet, cold and pathogens:

After birth, woman's weak body needs protection, and it is important to keep her from the "invasion" of wind, wet, cold and pathogens.

a. No bath or shower

b. No hair washing

c. No touch to cold and un-boiled water

d. No going out

2. Protect from body damage:

This set of regulations is considered as protective

a. Minimal physical activity

b. No reading

c. No crying or tears

C. Physiological and mental changes and adjustment (there is no particular rule regarding this section apart from encouraging women to rest as much as possible)

1. Physiological changes

a. Changes of the reproductive system

b. Changes of the whole body

2. Mental changes

A woman has to learn to take care of newborn baby, attach with him or her, and take the new role of being a mother (or of having a new child again).

a. Learn to take care of the new born baby

b. Learn to react and communicate with baby

c. Choose appropriate nanny

d. Accept motherhood

D. "Doing the month" and social network

Family members are responsible for taking care of the new mother and baby's daily life, and fulfilling their needs. The whole family is supposed to change their schedule in order to match the woman's and baby's needs. Family members are expected to help and teach the woman how to care for the baby. It is also vital to have rituals of celebration to elevate the interactions and bonds within the family network.

1. Family support of "doing the month"
    a. Pass on and believe the rituals of "doing the month".
    b. With the assistance of family member, practice the rituals.
    c. Adapt to a new family life and new family schedule.
2. Adapt to new role and relationships

    The birth of a new family member creates not only a new life, but also a new role and many other relevant roles (like grandparents, aunts, uncles ...etc). And this necessitates each member to adjust to new roles and new relationships.

    a. Relationship between grandparents and new grandchild.
    b. Relationships between son (child's father) and parents (child's grandparents).
    c. Relationships between daughter-in-law (child's mother) and mother-in-law (child's grandmother).
    d. Relationships between wife and husband.
    e. Relationships between siblings
3. Celebration of new life

Table 8.6: Food consumption and restricted items identified by the interviewees

Food encouraged to consume		
Food items	Major desirable qualities	Possible effects described by interviewees
Meat	♦ Heating ♦ *Pu* (replenishing)	♦ Warming, avoid coldness ♦ Replenishing *chi* (energy)
Sesame oil chicken	♦ Heating ♦ *Pu* (replenishing)	♦ Warming, keep out cold ♦ Replenishing *chi* (energy)
Donquei chicken	♦ Heating ♦ *Pu* (replenishing) ♦ Contracting ♦ Dissolving	♦ Warming, keep out cold ♦ Replenishing *chi* (energy) and blood ♦ Help uterus to contract ♦ Enhance blood circulation
Pig knuckle with vinegar	♦ Heating ♦ *Pu* (replenishing) ♦ Dissolving	♦ Warming ♦ Replenishing *chi* (energy) ♦ Help breast milk production, dissolves clots, improve blood circulation
Seaweed	♦ Cleansing ♦ Facilitating growth of new tissues	♦ Cleans out "old" and "dirty" blood ♦ Help baby to growth better (via breastfeeding) and have darker hair
Liver	♦ Heating ♦ *Pu* (replenishing)	♦ Warming ♦ Replenishing *chi* (energy) and blood
Herbs	♦ Heating ♦ *Pu* (replenishing) ♦ Cleansing ♦ Facilitating growth of new tissues ♦ Contracting ♦ Dissolving	♦ Warming, keep out cold ♦ Replenishing *chi* (energy) and blood ♦ Cleans out "old" and "dirty" blood ♦ Help baby to growth better (via breastfeeding) and have darker hair ♦ Help uterus to contract ♦ Enhance blood circulation *(Varying effects of different herbs)*
Hot drink	♦ Warming	♦ Prevent coldness
Brown sugar ginger soup	♦ Heating ♦ Cleansing ♦ Dissolving	♦ Warming, keep out cold ♦ Cleans out "old" and "dirty" blood ♦ Enhance blood circulation, re3duce cramps

Table 8.6 *(Continued)*: Food consumption and restricted items identified by the interviewees

Food encouraged to consume		
Food items	Major desirable qualities	Possible effects described by interviewees
Restricted foods		
Food items	Major undesirable qualities	Possible effects described by interviewees
Temp-cold foods	♦ Coldness	♦ Chill, prone to get cold
Peppery-hot foods	♦ Hotness	♦ Over heating, become quick tempered
Coffee	♦ Stimulating ♦ Hot	♦ Restless ♦ Over-heating, quick tempered, harms the baby (if breastfeeding)
Salty foods	♦ *Yin*, drying	♦ Thirsty, prone to *yin* natured illness
Crab	♦ Cold ♦ Poisonous	♦ Cold related illness ♦ Rash, impaired breathing, diarrhoea
Sour	♦ Stimulating	♦ Prolong bleeding, and lead to cramping
Cold natured fruits Citrus Melons Stone fruit	♦ Cold and stimulating ♦ Cold and wet ♦ Cold, poisonous	♦ Coughing, asthma, prolongs bleeding, menstrual cramps ♦ Asthma, arthritis, prolong bleeding, cramp ♦ Menstrual disorder, stomach cramp, digestive problem
Cold natured vegetables Cabbage Cucumber Eggplant Bamboo shoots Lo Po (Chinese horse radish)	♦ Cold and windy ♦ Cold ♦ Cold and poisonous ♦ Extreme cold, poisonous, *fa* (explosive) ♦ Cold, *ui* (disrupt *chi* flow)	♦ Cold natured illness, cause baby's stomach to cramp if breastfeed ♦ Prolong bleeding, uterus cramp ♦ Cause baby's stomach to cramp if breastfeed, skin rash ♦ Cold natured illness, delay wound healing, worsen or recurrent old illness. ♦ Coughing, asthma, difficult to breath
Chocolate	♦ Hot	♦ Overheating, skin problem

The confinement *("tso yueh tzu")* and breastfeeding

Fa-Nai (milk enhancing) foods

Seven out of 12 interviewees had ever breastfed. All the informants who ever breastfed said that how much breast milk they were able to produce was their major concern. Sea bass soup (and fish soups), pig knuckle with peanut, milk, black beer, and egg yolk with wine were believed to enhance milk production. According to the Compendium Of Materia Medica [307], milk can "supplement the weakness", and wine is able to "nurture blood" as well as "increase circulation". Pig knuckle is good for breast development by "dissolving the clots" and sea bass is good source of energy (protein), and helps the wound healing. In general, the "*Fa-Nai* (milk enhancing) foods" are high in protein, and it is a common belief that protein

helps women to recover from childbirth and increase both the quality and quantity of breastmilk.

Table 8.7:Food consumed by interviewees

Item No	High protein foods	*Fa-Nai* (milk enhancing) food	Sesame oil& ginger	Alcohol (time of first use)	Fruit (F)& vegetable (V)
C01	Pig heart, liver, kidney, chicken soup, sea bass, and sesame oil chicken.	No breast feeding	Yes	2nd week postpartum	F: apple, grape, cherry. V: Po-Chai, A-vegetable
C02	Egg, stew chicken, pig kidney, and fish soup	Sea bass soup, Pig knuckle with peanut	Yes	1st week postpartum	F: apple, grape, cherry. V: red vegetable
C03	Pig liver, kidney, and fish soup	No breast feeding	Yes	1st week postpartum	F: apple, grape, cherry. V: radish vege, red fung
C04	Pig liver, kidney, pancreas, chicken soup, sesame oil chicken, and fish soup.	No breast feeding	Yes	1st week postpartum	F: apple. V: A-vegetable
C05	Pig kidney, heart, chicken soup, sesame oil chicken, and fish soup	No breast feeding	Yes	1st week postpartum	F: apple, papaya. V: A-vegetable, Po-chai.
C06	Pig liver, kidney, heart, stew chicken, egg and fish soup	Pig knuckle with peanut, fish soup.	Yes	1st week postpartum	F: apple, grape. V: radish vege, red fung
C07	Egg, pig liver, kidney, heart, sesame oil chicken, fish.	No breast feeding	Yes	1st week postpartum	F: none. V: sweet potato leaf.
C08	Pig liver, sesame oil chicken, fish oil, and egg.	Pig knuckle with peanut.	Yes	10th day postpartum	F: apple, grape, lian-wu. V: Po-chai.
C09	Fish soup, pig liver, kidney, sesame oil chicken and egg.	Fish soup	Yes	1st week postpartum	F: apple, grape. V: none.
C10	Poultry, fish and egg.	Milk, black beer, egg yolk with wine.	No	No	F: apple, grape. V: not described.
C11	Pig kidney, liver, sesame oil chicken and egg.	No breast feeding	Yes	1st week postpartum	F: apple. V: A-vegetable.
C12	Pig kidney, sesame oil chicken and fish.	No breast feeding	Yes	1st week postpartum	F: none. V: A-vegetable.

Women's experience of taking *Fa-Nai* (milk enhancing) foods

Some women said they had positive experiences with special foods while some did not. C08 is an example of having good experience.

> ***C08*** *(BF, lived in nuclear family, her own mother was the primary caregiver during confinement)*
>
> *"I had to eat lots of nutritious foods because I fed (my children) breastmilk only. I had to eat a lot of nutritious foods otherwise I would not have had enough milk. .... Pig knuckle with peanut! It is a great recipe. I don't know how about other people feel about it, but that helped me a lot. "*

Since the foods prescribed as "therapeutic" and / or *Fa-Nai* (milk enhancing) are not common foods for many women, in order to "produce adequate milk", some women were forced to eat foods they do not like.

> ***C02*** *(Mixed feeding, lived in 3-generational family, mother-in-law was her primary caregiver during the confinement.)*
>
> *"I hate pig knuckle with peanut, I always hate pig knuckle and am allergic to peanut ... My mother-in-law said that I must eat pig knuckle with peanut everyday, or I would have no milk. ..... that would starve her precious grandson. ..... Can you imagine how miserable my life was! Yes, of course, sesame oil chicken,... imagine your breakfast is either pig knuckle with peanut, or sesame oil chicken... disgusting!"*

The effects of traditional practice on breastfeeding

All women aged more than 60 (C09-C12) stated that the tradition has evolved to encourage bonding and breastfeeding, yet the majority of the younger generation (C01, C03-C05) perceived the opposite. They stated that the tradition is to "discourage breastfeeding" or "makes breastfeeding very difficult".

> ***C04*** *(Formula feeding. Aged 32 had university education, housewife living with in-laws).*
>
> *" I wanted to breastfeed, but my milk was little...I guess it is more difficult for us Chinese to breastfeed. Foreign women do not have to "tso yueh tzu", so they can breastfeed...You know, my mother-in-law said I cannot wash my hair, cannot touch cold water, so I couldn't bath my baby until he was 2 months old. I can still remember my first time changing his nappy was when he was exactly 1 month old. I actually wanted to do everything for him during the confinement, but my mother-in-laws did everything for me, and I could have good rest. She said I could bath my baby until he is 3 years old, plenty of opportunity, but only one crucial timing("tso yueh tzu"), no other chance unless I give birth again... They say the baby needs feeding during the night if breastfeeding.*

My mother-in-law said it is a hassle, and baby would cry in the midnight, which disturbs everyone. She wanted me to have complete rest, I think her intention is kind and good, just too many regulations and restrictions...I felt so special, like a queen during confinement, that was probably the most pampered time a woman can get in her life".

C04's experience clearly illustrates the dilemma between the need of "rest" and the maternal instinct to "bond" with the baby. C11 offered an explanation of this phenomenon.

***C11** (MF: breast milk plus rice soup. Aged 71, had education up to institute of technology. Her education background was very good in her time.)*

" You think...in ancient time, women had to breastfeed otherwise the children would die out. Therefore, the tradition had to encourage breastfeeding naturally. Women had to labour and deal with domestic chores, very physically demanding lifestyle compared with nowadays. Many of them helped farming until childbirth. I think the traditional practice of "tso yueh tzu" was extremely crucial for the survival of both mothers and babies. Without that specific time for recovery and mother baby interaction, women probably needed to go back to work soon...Young women now are much more fragile, they want other people to take care of everything for them, including their newborn child and the mothers-in-law or mothers want to "show off " their importance...they do everything for the young women so that they are "irreplaceable". The mothers want to make sure that their daughter-in-law will be dependent on them after the confinement... . I would say this is not the intention of tradition, but people give it a modern interpretation, which suits everyone's need. "

Reasons for breastfeeding

When asked about "why breastfeeding?" young and old generations gave different patterns of response. The young generation (C02, C06, C08) reported "better health for my baby, better nutrition or less chance of getting breast cancer". All of those aged above 60 (C09-C12) expressed the sense of powerless and very limited choices they had at that time. And C10, C11 and C12 all said they had to breastfeed because of financial hardship they had.

***C06** (BF, aged 46, had University education)*

"I read lots of books and learnt that breast is best...it makes my baby healthier with less infection...."

***C12** (Mixed feeding, aged 86, had senior high school education)*

"We were not rich then, we had quite tough time, it was war time...(grimaced) I gave birth to three children and only one survived...every woman had to breastfeed, we are not as lucky as the young ones, we were poor, and could not afford to buy nutritious foods...I breastfed when possible...our life was difficult and I had to go to the farm to help my husband, my sister-in-law fed my child purees when I was away...At that time, no cow's milk (infant formula) was available even you are very rich, what the rich household did, was to hire someone (wet nurse) to feed and take care of the newborn."

Summary

Women from different ages and backgrounds had very different ideas about the tradition. In general, younger women tended to see it as "old tradition" and adapted it selectively. Older women tended to follow the rules more closely and took it as a belief, even reinforced it when their daughters or daughters-in-law give birth (data not shown). This inter-generational difference can create tension and discomfort especially between in-laws. The old women reported that the tradition is to encourage breastfeeding, but the younger women perceived that is to discourage breastfeeding. The source of the conflict may partly due to the implementation of old tradition in the modern world.

The postpartum period was a time to rest according to the tradition, however, in modern times, over-emphasising on complete rest very often is one of the reasons for mother child separation in the child's early days in Taiwanese society. This undoubtedly increases difficulty in initiating and sustaining breastfeeding. Mother-in-law's dominance during early postpartum days, thinking to "help" with the traditional arrangements, also had influence, mainly negative on breastfeeding.

8.4 Results: Factors influencing breastfeeding

As stage C gives one the background understanding of the postpartum tradition in Taiwanese society, stage A and B aimed to explore the factors currently influencing breastfeeding.

Due to their different nature, stages A and B are complementary. Informants in stage A remembered their birth process quite in detail, and the series of interviews gives us understanding of the dynamics of their memories. Moreover, stage A informants gave us more information about reasons for not choosing or discontinuing of breastfeeding. In contrast, women in stage B are committed to breastfeeding and their discourses gave us more knowledge about breastfeeding women's life experience. Both groups provided information about events during their hospital stay, and the events after discharge. We will present the findings of these two stages together in this section. Participants in interview A gave birth to two hospitals committed to promote breastfeeding and narratives from them reflect the practice in these two hospitals. Whereas women in stage B gave birth to various hospitals; some took part in the local breastfeeding-promotion programmes and some did not. Narratives from them come from a broader range of hospital practice in Taiwan.

Prepartum period

Women indicated several factors that influenced their feeding intention before the birth of the infant.

Maternal education and ability to fetch for information

Since breastfeeding promotion started just less than 5 years ago, there are few Chinese books regarding breastfeeding available to the public. In stage A, four out of five who breastfed beyond 1 month received postgraduate education, and in stage B, all of them at least went to institute of technology. In this study, we found that many breastfeeding (stage A: 3/5. stage B:

12/14) women read English books and/ or browsed foreign websites to reach information about childbirth and breastfeeding. They defined many interventions differently compared to those who breastfed less.

B13 *(Architecture, received her PhD education in Germany. BF for 6 mo. Plan to continue to BF as long as her baby wants.)*

"There is nothing available in the book store in Taiwan, I logged onto Amazon and wanted to know if there is anything (books) new, there were several German ones and some English ones... A friend of mine gave me "The Breastfeeding Answering Book" (by La Leache League International), you know, that book is huge, and all-inclusive! I also read " Breast is Best" and " How to support women to breastfeed", I think both of them are British ones...I read all of them, so did my husband...I think there is a need to translate more books like these to Chinese so that ordinary women can read."

Later in this interview

"I don't think the health professionals know what they have been doing. Doctors and nurses are equally naïve. Don't they read books? I mean English books with correct knowledge....When my baby was born, the doctor said" I know that you want skin contact, as you wish!". Then he brought my baby away, weighed him, washed him, dried him, wrapped him in layers of clothes, and said" We will do rest of the others later, you are our " special patient", and this nurse will be next to you during your skin contact!". I can tell that the doctor felt he was doing something very special, but I was totally screwed up. I asked the nurse: "is this so called" immediate skin contact?" She replied" yes, and you got the "first class treatment".

The first part of this passage reveals a theme that the ability to obtain breastfeeding knowledge has an educational gradient, and the current main barrier is a lack of Chinese books accessible to the general public. The passage can also explain why those who exclusively breastfed in the survey all reported that their baby was with the staff right after birth (see previous section).

Antenatal education

As found also by the survey (see next section), routine antenatal education seems ineffective in promoting breastfeeding. Many women (stage A: 9/25, stage B: 12/14) said they did attend antenatal education. As confirmed by the survey, the majority of those who attend antenatal education stated the session was to encourage breastfeeding, but many of them (stage A: 5/9, stage B: 11/12), especially those in stage B, said the antenatal education did not actually help them to breastfeed.

A 23-1 mo (Predominant BF at discharge. Exclusive BF at 1 & 3 mo.)

"Yeah...I went to several sessions, and two nurses did talk about breastfeeding. I think it is useful.... They only talked about the benefits of breastfeeding, and showed us several pictures how to breastfeed...I cannot remember, they did not discuss much...I think

breastfeeding is very practical, I need practical skill, not abstract knowledge, that does not help."

Intrapartum period

Birth experience and the effects of intrapartum interventions continue to affect women in the postpartum period

Most (stage A: 12/17) women who had vaginal birth showed certain degree of passiveness concerning their birth experiences, and were more satisfied with their newborn baby and accepted current birthing environment. Most women accepted the fact that, by nature, giving birth itself is painful, and their experience was not particularly worse than others.

A03-hospital (Mixed feeding at discharge and 1 mo. Formula feeding at 3 mo.)

"Of course it hurts, no one has painless birth even with epidural. I already knew that giving birth is painful, but I never expected to be this painful...Just like what my sister said, no matter how much you esteem your self, you are like an open display during birth. People just come and go. Everyone's story is the same anyway...Our technology is very advanced now and giving birth is safe."

In this example, A03 recalled her own birth experience and thinks it is similar to her sister's. Though she complained about being displayed openly, she accepts the fact that this is the way birth is done, and also admires the safety of birth nowadays. However, later in this interview, she mentioned:

A03-Hospital (Mixed feeding at discharge and 1 mo. Formula feeding at 3 mo.)

"My baby had some problems; they say it is something like electrolyte imbalance. A young doctor told me that because I received too much water when I was in labour...my child could not breathe properly for a while... doctor said this is not a serious problem, but they have to keep my child in the nursery for a while to follow him up."

Fluid overload during labour often leads to hyponatraemia and is associated with convulsion, respiratory distress, feeding difficulties and excessive weight loss. In this example, A03's child was kept in the nursery for monitoring which, consequently, affected their ability to initiate early breastfeeding.

Ineffective communication regarding medical interventions created distrust

From the interview, it is quite common that many of the interventions are not clearly explained to the women and their family members. This causes a sense of anxiety especially when it is invasive (e.g. vaginal exam and epidural analgesia) or being carried out frequently, and by different people, and particularly, when the health professional failed to give the result of the exam. The following passage encapsulates all these themes.

> *A14-1 mo (Mixed feeding at discharge and 1 mo. Token BF at 3 mo.)*
>
> *"Initially, they (staff) said they need to check how much my body has opened and one nurse suddenly put her fingers in (vagina)...I was terrified! I didn't know there is such kind of exam; it's something like Pap smear. After a while, two young male doctors came in and said they too want to check my vagina (cervix) as well.. Both of them insert their fingers in; one of them did it twice. ... they walked away and did not tell me how my vagina (cervix) is doing. I simply lay there and felt nervous. After I cannot remember for how long, about 1 hour perhaps, one senior doctor came in and 3 young doctors were with him. The senior doctor again put his fingers in without telling me what he was doing. He said something to the younger ones. Of course I do not understand what he was talking about; he was talking with other doctors not to me. He was teaching perhaps. And one of the young doctors did it again. It was very uncomfortable. I also wondered if there is something wrong with me. The nurse told me everything is fine, and told me not to worry too much.... This morning, just 1 hour ago, I saw that senior doctor again surrounded by several young ones. He told me to breastfeed, he is a nice doctor, but he did not tell me how, just told me to breastfeed. I guess he is a man and does not know how! Haha."*

A14 gave birth during the time when there were several intern doctors rotating in the delivery suite, therefore, many people practised on her without consulting her.

Other common themes also revealed in these passages are:

- Medical professionals talk to each other using medical jargon and foreign languages, which is impossible for a layperson to understand.
- They ignore the needs to explain before, during or after each intervention.
- Ineffective communication between health professionals and women.
- Inadequate time. Medical professionals seem very busy.
- Failure to acknowledge women and families emotional needs and respond in a proper way.
- Ineffective or lack of antenatal preparation. Women were under-informed antenatally about the medical interventions they are about to have during birth.

The next narrative is another example of ineffective communication between health professionals and women.

All these affect breastfeeding in several ways. First, women did not totally trust their health providers during birth, and this impression remained after birth. This may also explain how

the majority of women perceived the health professionals meant to encourage breastfeeding, but they did not really follow their suggestions(see previous section). The negative aspects of intrapartum care may well expand to postpartum care, especially the dynamics of clinician patient relationship.

A01-1 month (Mixed feeding at discharge and 1 mo. Formula feeding at 3 mo.)

"The drug they gave me was not working (to relieve the pain), and I told the nurse that the drug isn't working. She said" do you want an effective pain killer?" "Yes, of course, I feel I am dying!"... She then gave me "pain-free birth" (epidural /spinal analgesia)... I did not know this procedure is so complicated, and it also hurt, it was not a pleasant procedure at all. Is it "pain-free"? I felt like I was being cheated ... When I was about to go home, the bill included a cost of epidural...I cannot remember how much is it, but they did not tell me the National Health Insurance does not cover it, and I have to pay it out of my pocket... Shit! It was expensive, and my back keeps aching, and I did not know I would get headache. Shit again, they just want to make money out of me!...they asked me if I want the baby to be with me, I said no. Why bother? I think this hospital is trying to save money out of me! If I have to take care of my baby, the nurse can do something else, and I do not get my money back."

Later in this interview

"I had terrible headache because of epidural, I was not able to move for quite a while...I was not able to take care of even myself, I think it's better for my baby to stay in the nursery, I felt so drowsy... "

A01 did not know how epidural or spinal analgesia is done beforehand, and was surprised by the complicated procedure and unpleasantness. Moreover, the ineffective communication about the costs and the payment for the procedure further contribute the sense of lack of transparency of birthing procedure.

A theme of incentives for (over-) use of medication is also apparent in the passage. In another research of women's idea of medical safety, perceived abuse of medical intervention due to financial motivation was also commonly cited [308]. This also had impact on breastfeeding. As A01 depicted, her ability to move was disabled by this intervention, and may lead to ineffective early breastfeeding.

Episiotomy

The procedure and effects of episiotomy are also a common issue for women affecting their puerperal life. I prompted this issue by asking "Can you sit up and walk freely now?" and waited for their response. The response of this procedure during hospitalisation can be grouped as:

- It is a common procedure during birth, attempting to get the baby out faster and prevent tear.
- Sense of embarrassment and fear about this procedure.

- The wound is uncomfortable after the anaesthesia faded away.
- Unable to sit properly or move according to one's will compromises women's ability to take care of the newborn and adversely affects breastfeeding.

*A25-hospital: (*Mixed feeding at discharge. Token BF at 1 & 3 mo.)

"I remember when I was a little girl, and my mother told me how my brother and I were born, she told me that the doctor would use a scissor to cut the vagina and make the opening larger, so that the baby can be delivered, especially when you give birth for the first time. I was scared to death and asked my mother "isn't it painful?" she replied" you won't feel much pain because the pain of contractions nearly kills you, and the cut does not hurt too much"... I did not have a second thought when I had episiotomy, every woman needs one if she is to give birth naturally....It hurts, I cannot sit and move!..."

A25 recalled her conversation with her mother when she was a little girl. Informants A01, 04, 13 and 18 also recalled similar conversations with their mothers, while A 07,11 and 32 had similar conversations with their sisters or other female relatives.

A18-hospital (Mixed feeding at discharge. Predominant BF at 1 & 3 mo.)

"When my doctor told me that he was going to cut my vagina open, so that the baby would get born faster and I no longer needed to suffer (from contractions), I asked if it is necessary. He said" yes, this cutting also prevents further tearing and we will stitch the wound carefully, there is nothing to worry about." The reasons (doctor was giving) are quite acceptable. "

This example illustrates the most commonly cited indications of performing episiotomy. One is to deliver the baby sooner, and second is to prevent tear.

Though it is perceived as a common procedure and the reasons seem acceptable, most women found the procedure scary.

A14-hospital (Mixed feeding at discharge and 1 mo. Token BF at 3 mo.)

"... I heard the doctor said to his assistant "ok, prepare for surgery", I was so scared and asked "is there anything wrong with my baby, are we going to have CS? " "No" he said easily "I am going to have a minor operation, to cut your vagina open and to get your baby out "... I saw a scissor and was scared to death... I wanted to kick his shoulder and made him not to do it, but the young doctors and nurses stopped me..."

To explore this sense of fear further, A14 revealed her feelings after 1 month.

A14- 1 month (Mixed feeding at discharge and 1 mo. Token BF at 3 mo.)

"you know, the vagina is not only a passage for birth, is also a organ to have sex and please ourselves and men...sorry, I am being daring and outspoken here. I could not imagine having a wound through my most sensitive and intimate part, it is ..uhmm, well,

horrible. I feel that part (vagina) was mutilated and feel sorry about myself. "

Feeling embarrassed

Feeling embarrassed to talk about the discomfort of this procedure is also a common scenario.

A24-1 month (Mixed feeding at discharge and 1 mo. Token BF at 3 mo.)

"One young nurse came in and taught me how to take care of my wound yesterday. See, this is the magic of education, a twentyish young woman talked about it calmly. ...The wound...you know, I found young women nowadays are so open. The wound down there which makes me unable to sit up and walk in a funny way. The doctor came in early this morning and checked if my wound is ok. You know, I am an introverted kind of person and feel shy about it. I have a stinging feeling when I go to the restroom (pass urine), so I think it is better no to drink too much. I am not allowed to drink water during "tzo yhuh tze" period anyway. But my mother-in-law wants me to drink chicken soup you know with lots of soup. I do not want to tell her it hurts when I go to the restroom, she should know...I tried once to feed my baby, but it hurt when I was struggling to sit, so I think it's better to wait..."

In this illustration, A24 revealed her dilemma of telling the caregiver her true difficulties and inconveniences associated with episiotomy. In Taiwanese society, sex and external sex organs are still considered as taboo issues to talk about. The majority of the informants commonly note pain and discomfort incurred by the procedure. Moreover, the degree of discomfort very often affects women's ability to take care their newborn children as they would.

***A13-1 month** (Mixed feeding at discharge. Exclusive BF at 1& 3 mo.)*

"I had terrible pain after my baby was born,... each joint, each finger, just like being torn apart. The kind of pain I had... , was very very exhausting. I had terrible backache during labour. You know, that kind of unbearable pain. My appointed doctor went abroad, this was someone I didn't meet until birth. I even asked someone to recommend a doctor. At last, I found out that he specialized in infertility treatment, like tube baby. He always manages multiple birth, all of theses are delivered by caesarean section, he has very limited experience in normal birth. Probably my original doctor has more experience (in vaginal birth), but the one to substitute him was a young doctor who does research with him. Perhaps he has a lot of experience in performing CS. I knew when he had the first cut, but the baby was still inside (the birth canal), I saw him cut twice, ...no, cut (the perinium) at leas three times. The wound hurts extremely, and never heals. People say that normal birth recovers quicker (than CS). I could not help but take a mirror and see it myself, I nearly fainted away, and the wound was so large..., very close to the anus. I nearly fainted..."

Later in the interview

"I always wanted to breastfeed, and had already signed up for unlimited room-in. I waited for my baby for about 4 hours, finally a nurse gave him to me, he was so beautiful...I tried

to breastfeed because I know the importance of early suckling on the breast, but I could not sit, even could not sit up to hold him. I cried because this was not what I had planned for. The nurse was very kind, she taught me that I could breastfeed by taking side-lying position...when my baby suckled on my breast, it was wonderful, accompanying the painful sensation of uterine contraction. I had terrible headache due to lack of rest. My husband and I finally agreed to send my baby back to the nursery for a while so that I could rest. I know staff there fed him formula, this is not in my plan either, but I was powerless to change the fact that I myself was in pain and required rest."

Complications of episiotomy

Apart from being a painful and disfiguring procedure to the mother, episiotomy repair can also influence early bonding, skin-to-skin contact and early initiation of breastfeeding. When doctors were performing stitches, the nurse usually took the baby during the repair fearing that the mother may not be able to hold the baby steadily, especially when mother remained in a lithotomy position. In most hospitals in Taiwan, babies are put under radiant warmers during the suturing and many procedures are performed, including eye drop, weighing, measuring, cord care and even bathing. Many of these have been shown to interfere with early breastfeeding [309]

In this study, all women who had vaginal birth also had episiotomy, which is consistent with the survey results (see later section). Some women described episiotomy as painful and hurtful (stage A: 10/17, stage B: 8/9), some said it was "odd" or "uncomfortable" (stage A: 5/17, stage B: 1/9)

In the passage below, A20 expressed her feelings of pain due to episiotomy, and interference with her early postpartum life.

Pain of the wound

A20-hospital*(Mixed feeding at discharge. Exclusive formula feeding at 1 & 3 mo.)*

"My God, it was so painful, I really want to shout dirty words... I could not walk, sit, and going to the toilet is also a nightmare. I dared not to drink any water because passing urine kills me... I was told there are two ways to prevent episiotomy, one it to let it tear, and it would tear severely and this sounds worse; the other way is to have CS. I now realize why so many people including SY Chen (president's daughter, a dentist) decide to have CS, CS is better. "

After a month, A20 developed a wound infection, and this further jeopardised her ability to take care of her newborn including breastfeeding, and even to carry out daily activities.

A20-1mo *(Mixed feeding at discharge. Exclusive formula feeding at 1 & 3 mo.)*

"I had infection...trust me, you can never imagine how degrading it is. I felt a bit

strange when I was about to be discharged, the doctor said it is normal to feel abnormal, and it will heal in weeks, he also said he did a "beautiful" stitch and my husband and I will be "happy" (implying having sex) with no problem. ... I went back one week later and told him I still feel uncomfortable, he replied again that it is not a problem...the pain from the wound became so unbearable that my husband brought me to the emergency room... the wound was already infected....it hurt so much...I could not sit properly till now (I month) and forgot about breastfeeding. I cannot sit, how can I breastfeed, although I wanted to?"

Apart from pain, a few women (stage A: 2/17, stage B: 1/9) said they developed further infections, and these severely affected their postpartum lives.

Sex and episiotomy

Another complication of episiotomy is difficulties in sexual intercourse. Some women (stage A: 6/25, stage B: 5/14, stage C: 8/12) said that they had been told not to have sex for several months "by tradition", when asked about their own feelings, most women with vaginal birth (stage A: 12/17, stage B: 9/9 ,stage C:4/8) said "it is painful" or even "physically impossible".

***B07** (Predominate BF for 6 mo. Also BF a 2-year-old.)*

"I really feel sorry towards my husband. He had to put up with me when I was pregnant, and now, I have no desire to have sex at all. Whenever I think of my private parts, I feel disgusted; a not-so-familiar man damaged my most intimate and private organ. What would my husband think when we have sex?"

Satisfaction with care around birth

Most women (stage A: 24/25, stage B: 8/14) expressed their gratitude towards health professionals, especially obstetricians, no matter how good or bad their experiences were. Culture can have great influence on this, since "complaint" is considered as "bad manners" in Chinese culture, and this is made worse if the object is considered as authority i.e. doctor. In the series of interviews, I found that despite of initial thankfulness to the health professionals, most women started to recall and report more negative perspectives of their experience. This finding confirms our survey that 54.2% of women had shown less satisfaction about the health care they received during birth after 3 months (see previous section).

Scenes of birth flashback during the postpartum time period

***A19- hospital** (Mixed feeding at discharge. Formula feeding at 1 & 3 mo.)*

"I am so grateful, what can I blame for? My doctor told me I have a healthy baby after all that! Everyone has to suffer during birth, and I quite accept that...I have never heard of any good birthing story... they say that it is like a marketplace when you give birth...no one has privacy during childbirth unless you opt for surgery."

A19-1 mo *(Mixed feeding at discharge. Formula feeding at 1 & 3 mo.)*

> *"The doctors and nurses were quite impatient, they were always in a rush... they even did not listen carefully. My husband was hungry and a nurse went by, we asked where to get some light food, she yelled at me" you are not allowed to eat, or you would vomit, and we don't yet know if you need surgery or not"... We were both mad at her, it's not me who's wanting food...*
>
> *...I tried to push very hard, a nurse climbed up to my bed and pressed my belly (fundal pressure) over 2 contractions. A young doctor said that was not working, the baby was not coming down, he joked with another nurse and said" you are fatter, you do it and your body weight will do the job!" Everyone laughed and I was embarrassed..."*

A19-3 month *(Mixed feeding at discharge. Formula feeding at 1 & 3 mo.)*

> *"My cervix opened very slowly, I guess because this is my first baby. After inserting his fingers in (to my vagina), one chief doctor turned his face to three younger-looking doctors said "still very tight, her husband must be very lucky (implying during sex intercourse). If you marry a dancer and you would be just as lucky (as her husband) ". I felt like I was being raped...*
>
> *After my baby was born, I heard him crying, They showed me his lower body and told me he is a boy. I was lying there and couldn't see him. They brought him away to do a lot of things, and my husband rushed there (newborn care table) as well. I was left alone...the doctor made my husband deal with the admitting procedures, and I was about to move to the ward, I saw my husband leaving, I said" can't you stay with me for a while?" The nurse said with a long face "don't be so unreasonable, he has business to do "... I asked if I can hold my baby, a friend of mine told me that she held her baby for a long while and that felt marvellous...the nurse handed my son to me, he was so beautiful... she (the nurse) was inpatient and said "see, Mrs. you have plenty time to hold him when you return home, he is not going to be gone, we need to send him to the nursery, you don't want your baby to have any kind of problems, do you!"*

This series of narratives from informant A19 clearly showed that she was able to accept the fact that birth itself is a pain, and she felt grateful to the care she received. After 1 month, she started to recall the pain from fundal pressure, and the impatience expressed by the health professionals. At the third month, she started to report the rudeness of doctors and nurses, and several malpractices that may interfere with early breastfeeding.

Caesarean section

Caesarean section (CS) is also a factor associated with delayed effective breastfeeding. The prevalence of CS has been about 35% in Taiwan for decades, and for many women, they can still "choose" to have the operation performed by certain doctor at certain time.

The emerging themes are as follows:

CS is considered as "safer childbirth"

B11 (BF for 11 mo.)

"I got pregnant quite late, and was an "elderly" pregnant woman. Everybody said it is high risk, my parents and parents-in-law were anxious about giving birth. They thought CS is a safer way. Chen (president's daughter) gave birth that way as well.

I cannot afford to have anything wrong, I am too old...ha."

In this passage, B11 justified her CS by her age, then by celebrity behaviour. Mrs. Chou (SU Chen) is the President's daughter and a dentist. Her story of having a baby boy dominated headline news, she was accepted for post-graduate study the same year as she gave birth. In opting for CS, the president said he supports his daughter's choice, so that she can enter school without too much delay. Since the baby boy's birthday is exactly the same as the president's, there were gossips about intentionally choosing date and time for better future. Also, in many public occasions, the first family had expressed their joy and expectations of their "Gold Grandson", a Chinese expression of a precious and noble child. Therefore, some people had worries that "aping the famous syndrome" might increase the CS rate. Chen's behaviour was a mixture of modern women with superstitious family background.

Vaginal birth is perceived as more brutal

A15- 3 mo *(Token BF at discharge. Exclusive formula feeding at 1 & 3 mo)*

"You know, I am a nurse and saw NSD (normal spontaneous delivery) when I was a nurse student for the first time. Bloody hell, that was horrible... I swore to myself that I would never ever give birth in that way (vaginal birth)... My mother-in-law and I think it is better to go for CS, it is safer, faster and pain free, isn't it? My mother-in-law also chose a good timing (for the birth) and a name to match my son (according to the fortune-teller). You know, I don't believe it and think she is superstitious. ... I was to have CS anyway... My husband is the only son and my parents-in-law care very much about my son... they said that they couldn't afford to take the risk of (natural) childbirth and wanted CS."

CS provides more predictable life

A22-3 mo *(Token BF at discharge and 1 mo. Formula feeding at 3 mo)*

"I am a surgeon; when I was junior, my boss told me that I am not allowed to get pregnant until I am promoted as Visiting Staff. ...It was very difficult to arrange my shifts and waiting for the natural timing is simply impossible. We are always less busy during summer, and lot of my colleagues take long holidays then. My due date is 20th July....I had to ask my colleagues to cover my shifts ... I worked in the morning and afternoon, went to the operation theatre in the evening and my child was delivered... Everything was perfectly on time, and this is my way of coping with family life and work."

Later in this interview

A22-3 mo (Token BF at discharge and 1 mo. Formula feeding at 3 mo)

"I have never dared to think about breastfeeding, it is impossible to me. You see, I even had to schedule my operation (CS), how can I breastfeed? I have no time!"

A22 is an example of a women working in a high demand environment, which is not friendly towards women's reproductive nature. Taiwan has passed a law to protect women's maternity leave at 52 days, but many women still have to shorten their leave with the fear that they may be laid off if they take longer leave. This passage illustrates the known timing that CS carries is an advantage of many women. A 15, a nurse, A 21, a banking manager also reported this is the way they had to go.

Woman's vagina remains intact, less effect on sexuality

***B08:** (BF for 5 mo. Just started adding complementary foods.)*

"During pregnancy, my husband was very worried about sex life after baby is born, I could sense his anxiety, I felt very sorry to him...He eventually told me the truth that he cannot imagine how he is going to have sex with me if our baby is getting out from there (vagina) as well. He went through all the physiology he learnt and had nightmares... I think his mother has influence on him. My mother-in-law asked me if I consider having CS, I said "why, there is no need?' she answered: " otherwise your bedroom life (sex activity) will be dismal, your husband will feel depressed. "

B08 is a physiotherapist and her husband is a physician. Her husband's worry about postpartum sex life is one of the factors that led to her CS. Several women (9/25 interview A, 12/14 interview B, both types of delivery) had mentioned about sex integrity after childbirth. Since episiotomy is performed in every woman with vaginal birth in this study, this is a bizarre reflection on body disfiguration.

Myth of "pain-free childbirth" and the reality

***A21-hospital** (Mixed feeding at discharge and 1 mo. Token BF at 3 mo.)*

"I thought there would be no pain, or much less pain involved in CS. No one told me it is so painful!... My baby was breech and I had no choice but to go for CS. Everything was ok and went smoothly. When I woke up after birth, I felt quite dizzy... Several hours later, I wanted to go to the toilet and one nurse shouted at me said "don't move like this! You just had major abdominal surgery!" Why nobody told me it is a major abdominal surgery beforehand? ... I am not able to room-in with my baby though I'd like to, what a shame! When it hurts, tears are running down my cheeks."

Before discharge, A21 experienced the pain of the CS incision, and questioned why there was no information given to her saying CS is a major abdominal operation. This affects the mother's willingness and ability to room-in, and also affects breastfeeding behaviour.

***A05- hospital** (Mixed feeding at discharge. Predominant BF at 1 and 3 mo.)*

"I am only 1.5 m high and very small but my husband is very huge as you see. They said my baby was very big and I might not be able to give birth naturally...The incision makes my life very inconvenient, and it is so challenging to hold and breastfeed my baby. When my baby sucks on my breast, you know that kind of pain... shooting pain...I wanted very much to have 24-hr room-in, and was ambitious enough to hold my decision at the first day, well, last night, I found it impossible and asked the nurse to take my baby away. I know he is going to have some formula even though I told them that I want to breastfeed..."

In this passage, A05, a committed breastfeeder, had to compromise her own wishes due to physical inability after CS. When the baby is separated from the mother, there is an increased risk of it being given formula. For women with strong intention to breastfeed, like A05, their ability to breastfeed resumed after the first few post-operative days.

A05-1month *(Mixed feeding at discharge. Predominant BF at 1 and 3 mo.)*

"... The pain from the incision is nearly unbearable. Initially, the wound made uterine contractions so painful that I shed tears while breastfeeding... I know my child suckling on my breasts helps my uterus to contract and recover more quickly... but I cannot describe how painful it is. I am quite lucky that it (pain of contractions) has gradually become better and the wound heals quite ok, but my low back aches, I think probably because I had epidural pain relief. One article I found on the web said it increases the risk of getting back pain, I just knew it and no one told me in hospital... I am very very lucky, my friend visits my place and helps me breastfeed. I cannot do it without her support, and my husband's."

In this stage, A05 is the only one who had CS and breastfed more after discharge. All women with CS in stage B (5/5) mentioned about the difficulties to initiate breastfeeding and the extra support they need.

Her passage is also an example of lack of information given by health care institutions.

To summarise, the common perceptions about CS are reported by the women are:

- CS is considered as "safer childbirth"
- Vaginal birth is perceived as more brutal.
- Timing of the birth affects the baby's future.
- CS provides a more predictable life by planning the time of birth.
- Women's vagina remains intact, with less effect on sexuality.
- Myth that CS is pain-free before childbirth.

Early skin contact

Early and adequate skin-to-skin contact is very important for breastfeeding initiation. However, most women in Taiwan either have skin contact that is too short, or too late. Moreover, many hospitals still wrap babies up and thus limit direct skin contact.

Uninterrupted early contact gives the family a positive experience, and promotes the initiation of breastfeeding.

A17- hospital *(Predominant BF at discharge. Exclusive BF at 1 & 3 mo.)*

"I read lots of books talking about the importance of early contact. Since my husband works in the same hospital (as I give birth), we told my obstetrician that we want uninterrupted contact as long as possible. We made it, we did it! ...My husband and I both agree that this is one of the most beautiful experiences in our lives... my baby started to suck my breast naturally when he was about 40 minutes old, just like what is written in the books! It is amazing! ...we both saw him started sucking, there is no need to teach, he is so smart! "

This passage showed a clear picture of the early skin contact and rooting reflex. However, in stage A, only 4 out of 25 reported unlimited early skin contact (A05, 13, 17 and 23). In contrast, all women in stage B recalled their first contact with their children as adequate.

A17's husband works for the hospital, and that gave her the advantage of expressing her wishes before delivery, and also being treated differently. Not all women were as lucky as A17, some women (5/25 stage A and 10/14 stage B) mentioned that they had to press the health professionals hard in various ways so that they were able get what they wanted.

B07*(Predominate BF for 6 mo. Also BF a 2-year-old.)*

"I knew they were not happy about that, so I had to fight. During antenatal visits, I told my doctor that I want him to put my baby on my tummy right after birth, no washing, no weighing, nothing until I feel happy. He was reluctant, I told him that I will go somewhere else if he does not do so, yeah, kind of threaten him, and he said, ok, but you have sign a consent form first... "

Though women enjoyed their early moment with their children, health professionals misunderstanding of early contact may ruin this practice. The following passage showed that the nurse thought the baby should be able to breastfeed right after birth, and passed the message to the mother, which affects mother's confidence in her child's ability to breastfeed. Hospital policy of restricting skin contact is also a hindrance. Since it is still not common to have fathers in the delivery suite, a nurses' presence is essential for safety issues. Ward managers generally do not allow any waste of human resources, and 20 minutes of skin contact is luxury.

A11-hospital *(Mixed feeding at discharge. Formula feeding at 1 and 3 mo.)*

"The nurse handed me my daughter, she is so beautiful...they said it is time for her to suck on my breast and start to learn to breastfeed... I am quite confused actually, how can my daughter started to breastfeed at that time? She was too tiny and eyes barely opened! (Do you remember how long was it?) Yes, it was less than 15 minutes after birth, there is a big clock hanging on the wall. Everyone was gone apart from a nurse standing next to my bed, helping my daughter, and pushed her to my breast. The nurse told me that the baby should be able to suck my breast right after birth. She (baby) was probably too sleepy and would not suck. I think she is not that breastfeeding type of child who breastfeeds right after birth... I don't know, is it kind of hospital policy or something? She (nurse) said my child is with me for 20 minutes and it is time for her to go back to the nursery...She stood there, like an inspector, and kept checking the clock...well, she was very punctual, took my baby away right on time. I had a tremendous sense of loss. I waited for another 8 hours to see my child. "

Room-in and demand feeding

Several (6/25) women in stage A and 10/14 in stage B said room-in and able to feed the baby on demand is the key to successful breastfeeding. And room-in was also a positive experience.

***B09** (BF for 10 mo. Plan to wean recently.)*

"I had my baby in my room all the time, he was next to me all the time, and it was fantastic. I fed him whenever he was hungry, and there is no need for schedule. It is a wonderful feeling. Even though I have strikingly strong will, it was still difficult to overcome physical discomfort. I did not expect that CS could hurt so badly like this. A good policy like room-in is very important. That gave us a good start, and I have been breastfeeding well."

Malpractice

I also identified recurrent themes about malpractices that were detrimental to breastfeeding during hospitalisation, and remained in place after discharge.

Separation, pre-lacteal feeds nipple confusion cause poor latch-on and formula feeding

Mother infant separation often leads to pre-lacteal feeds with formula. Though the hospitals we studied were accredited as baby-friendly by local authorities, and all of them have policies to encourage room-in, they were not practically reinforced. When separation occurred, inevitable supplemental feeds with formula by bottle, which lead to nipple confusion, poor attachment, maternal infant frustration, and breastfeeding failure. This series of events are illustrated by A 24's narratives from hospitalisation to 3 month.

***A24-hospital** (Mixed feeding at discharge and 1 mo. Token BF at 3 mo.)*

"...I waited the whole night thinking about my newborn child. I could not sleep well and my husband said I worry too much. Early next morning, I rang the nurse to see if I could

see my son, they said "it is still too early, doctors are having meeting and will check my baby later." I waited for another 3-4 hours to see my child for the first time...One nurse handed my son to me...I hold him closely and he was sleeping. They said that I could try to wake him up and see if he wants feeding...he sucked twice weakly then felt asleep...I am so worried that if my baby is not having enough, the staff have told me that they fed my child in the nursery when he was hungry, and it is impossible that my baby is starved...I have my son with me in the same room during the day, sometimes he needs to be back to the nursery if a doctor wants to examine him...when I try to breastfeed, see, his mouth wouldn't open, or open like this (narrow). My breasts became very full and sore since yesterday, feel very uncomfortable. They (staff) told me that just let my baby suck, but it was not working; they then told me to express my milk... I tried just before you (interviewer) came in, it hurts, and I only have few drops of milk. I think I have inadequate milk..."

***A24-1 mo** (Mixed feeding at discharge and 1 mo. Token BF at 3 mo.)*

"My nipples have been very sore, eroded...it is so painful breastfeeding. I have been trying to express my milk and there is not much in my breasts...My mother-in-law likes feeding him anyway, she wants the most expensive formula but I think all the brands are the same..."

***A24-3 month** (Mixed feeding at discharge and 1 mo. Token BF at 3 mo.)*

"I nearly have no milk now. I can rarely squeeze one or two drops of milk out from my breast...to feed my son...I am not type of breastfeeding woman who can overcome so many difficulties, it's just not for me. I don't have enough milk plus my baby does not suck my breasts..."

In stage A, 19/25 reported similar sequence of events. Whereas in stage B, there are narratives showing how they managed to survive the first few days of pressure.

***B11** (BF for 11 mo.)*

"Midnight is another nightmare. There were few people in the nursery. My mom-in-law went with me, and seeing baby cry, she wanted to give him a bottle, I refused, and she said to my baby:" poor baby, bad-luck baby, your mummy does not give you anything to eat, she is not a good mummy! Poor little one." I was very sad hearing that. But I knew that this is the right thing to do, and our physiology works on its pace. I knew all the knowledge, but I did not know breastfeeding is such a tough decision. I was physically tired, and the nurse was very unfriendly, perhaps she didn't mean it. ....my family was not supportive, it was so hard. I was strong enough to stand fast, milk eventually came in ..."

Reasons for maternal- child separation

There are many reasons of separation concluded from the narratives, and classified as below.

<u>*Health professionals' perception that mothers were tired after birth, and needed rest.*</u>

It is a common perception of health professionals that women want to rest completely after birth, which ignores the effect of endorphin. In the following passage, B05 revealed her desire to see her child and worries when separated.

***B05** (Exclusive BF, baby is 4.5 mo)*

"It is a vicious cycle, the key point (of breastfeeding) is the (first) 6-8 hours after birth. They (the staff) did not bring the baby to me. I waited for a long time, probably 5—6 hours, you know. They (staff) were very ridiculous, they did not believe that I was able to take care of my child, they kept separating us and said: have rest, you are tired. I said: I cannot rest, and I am not tired. My baby has been inside my body for 9 months, and you don't let me see him after he is born. I was very worried and kept asking for my baby."

After a while, since both B05 and her husband are both lawyers, she said

***B05** (Exclusive BF, baby is 4.5 mo)*

"I told the nurse that she should bring my child to me immediately (strong expression), it is illegal to keep my child away from me, I am his parent, custody by law. If she does not do so, I will sue her, sue the head of the maternity ward and the hospital. Here it is, I got my baby with me, none dared to separate us. You got to be strong and tough, otherwise, you lose..."

Spatial allocation makes visit difficult

Many of the hospitals were built without a sense of user-friendliness. Plus, in most hospitals, mothers stay in the maternity ward, which belongs to the department of obstetrics and gynaecology, and babies stay in the nursery, which belongs to the department of neonatology. These two departments are very often separated, even on different floors. When the majority of the babies are rooming-in with their mothers for most of the time, this is less problematic; however, when the majority of the mothers and babies need to travel to be together, this spatial separation makes things worse. Since separation of the maternity and the neonatal wards were common in Taiwan, the local breastfeeding promotion programme did not intend to make hospitals change their spatial arrangements. Many of the locally accredited baby-friendly hospitals still have separated allocations to mothers and children.

In the hospital we studied, the maternity ward and the nursery were on different floors. And all the informants in stage A mentioned this. In stage B, 8/14 reported that they were in different floors, or in different parts of the hospitals.

***B06** (BF with complementary feeds, baby is 14 mo old, no plan to wean completely.)*

"The nursery was on a different floor, and I needed a wheelchair right after birth. It was terribly difficult to get up and down frequently. It was particularly difficult during daytime when the lifts were busy. It took a long time to get to nursery and I cared for my child very much."

Baby needs medical investigation by paediatrician

In Taiwan, most paediatricians still carry out routine neonatal check up in the nursery. Some are willing to go to the mother's bedside, and some are not. Many women (stage A: 18/25, group: 9/14) cited that their children had to go to the nursery because doctors had to check them.

A24-hospital *(Mixed feeding at discharge and 1 mo. Token BF at 3 mo.)*

"... Because my son was born at midnight, they (staff) took my child away to the nursery and said that the paediatrician would check if he is ok the next morning. I waited the whole night thinking about my newborn child."

Mother perceived rooming-in as exhausting

Since rooming-in is a new concept in Taiwan, most women still have the impression that they have someone to look after their baby during hospitalisation. And the majority of (20/25) women in stage A still think rooming-in is tiring. However, none of the informant in stage B stated that room-in is exhausting.

A01-hospital *(Mixed feeding at discharge and 1 mo . Formula feeding at 3 month.)*

"I was extremely tired after long labour. I laboured for three days. I choose 4-hour room-in when admitted, but find it impossible. I need rest, my mother and mother-in-law say it is crucial to have complete rest after birth; otherwise I will get all sorts of "women's disease". I am very very tired and need to sleep. They (nurses) take care of my baby well, and it's their responsibility too. My mother-in-law said we don't get our money's worth if I take care of my child. "

As part of the assessment of local breastfeeding promotion programme, the hospitals are requested to report their percentages of "4-hr, 8-hr, 12-hr and 24-hr room-in rates", therefore, it is common practice to ask women and their family which type of room-in they would like. Inevitably, many women go for 8 or 12-hr room-in so that the baby is brought to the nursery after dinner or during sleep hours, and that is the time when most supplementation with formula and use of pacifier happen.

Interrupt other people in the same room0

If the baby cries in a shared room, the mother and relatives always feel sorry for the other beds next to them. And this is a common reason why women are reluctant to keep their babies in their room. In stage A ,12/25 (9 were in single room) stated this as one of the reasons not having 24-hr room-in. In stage B, 6/14 (7 in single room) said this was a problem but did not say they therefore let separation occur.

B-01 *(BF with complementary feeds, baby is 7 mo old, no plan to wean yet.)*

"I stayed in a twin room, and they (health staff) said it is not convenient to have my baby in

the same room with me. They said daytime room-in is probably fine, but if my son cries during nighttime, it bothers those in the same room. My mother-in-law said it is better not to offend others..."

Share a room with patients, not with postpartum women

In some hospitals, the department of obstetrics and gynaecology share the same inpatient area, and mothers may need to share a room with patients with illness or medical conditions, say breast cancer, or miscarriage. This is a difficult situation for an individual woman and family to decide whether to room-in; if this happens, most of the health professionals do not support room-in. No woman in stage A had this condition since the hospital did have separate areas for different people, but 2/25 mentioned they have friends who had experienced this situation. And 3/14 women in stage B reported this situation.

***B12** (BF for 4 mo and plan to wean at 6 mo.)*

"...the hospital I gave birth has some difficulties. Initially I wanted a single room but all of them were occupied, thus I had a twin room, the woman next to me was a cervical cancer patient...my doctor told me that the department of OB and Gyn has one ward and they have tried their best not to mix OB patents with Gyn patients...I very much wanted my baby to be with me but I was afraid of my baby crying and bothered the woman next to me... she also had a lot of visitors during the day, my husband and I both thought it is not a good idea to have our baby in the room... I moved to a single on the second day and my wound was better by then... I finally got my child with me all the time. "

Inadequate staffing

In some hospitals, the health professionals believe that they need to take extra care of those who decide to room-in, and when they are "busy" or "short of personnel", they are very reluctant to take the child to the mother's room. This was not reported by stage A, but 7/14 in stage B had the impression.

***B02** :(Mixed feeding for 10 mo. Planning to wean.)*

"Everyone seemed in a rush. After birth, I was so excited to have my daughter on my chest; it is one of the most unforgettable experiences in my life. My husband rushed out to deal with the administrative procedure, and there was a nurse stood next to my bed, kept checking her watch and said: ... something like: I am very busy, give your child to me and I will bring her to the nursery. I waited for 6 hours to see my daughter again. I rang the nurse, the chief nurse came in and said: everyone is busy and we are not able to take care of you if you want to have your baby in your room. We need extra staff to take care of you."

Commercial promotion

Commercial promotion of breastmilk substitutes damages breastfeeding. In Taiwan, the government has little control over the breastmilk substitutes market and violation of the International Code of Marketing Breastmilk Substitutes is evident.

There are several ways of commercial marketing commonly cited by women.

Antenatal education as channels disseminating samples and gathering women's contact details

Most of the antenatal education session are carried out by hospital staff and managers who often treat them as minor routine. Many commercial bodies grasp the opportunity to use antenatal classes as chances to contact women. Some of the companies even have their own classes held in hospital. Almost all women (24/25 stage A, 14/14 stage B) noticed this theme.

A19-hospital *(Mixed feeding at discharge. Exclusive formula feeding at 1 & 3 mo.)*

"...my husband and I went to several antenatal education courses talking about prenatal check up and newborn care...we both like attending because we always end up with lots of gifts bringing home... including free samples of "pregnancy-formula" (for pregnant women), blankets, teats, bottles, diapers...they all look quite good... all that we had to do was to fill a questionnaire with my ID number, telephone number and address, and the receipt is for a lottery! "

Company's direct contact with women

Many (23/25 group, 10/14 stage B) women had direct contact by the company personnel either by phone, or in person.

A19-3 mo *(Mixed feeding at discharge. Exclusive formula feeding at 1 & 3 mo.)*

"I received calls from nurses in Med Johnson and EnFlac, they were nice and patient, helping me with all my problems. They also sent me samples of hypoallergenic formula..."

Contract between hospital and Formula Company

There are some secret contracts between hospitals and companies, and only insiders know the story. B09, a physiotherapist, describes the situation.

B09 *(BF for 10 mo. Plan to wean recently.)*

"You know, how malicious the companies are, the hospitals are no good either. My husband (physician) told me that several years ago, when hospital X was gathering money for their new building, A Company and B Company donated several millions, a huge amount of money. They are not charity organizations are they? They had contracts with the hospital that the hospital has to pay "per baby" as feedback...(what? I don't understand) You don't know? It's very common, especially rural areas and small clinics. What they do is that during hospital stay, each bed is assigned to one brand of formula, which is one point. The mother would also receive free sample of that brand of formula at discharge. The contact details of the woman are offered to the appointed company (by hospital) so that they can contact the women after discharge. One baby is one point, and they have to pay as

many as the company's donation. The fertility rate has been dropping and much fewer birth they are having per month, can you imagine, the contract would be valid for many years!"

Family types affect women's intention to start breastfeeding and uncertainty of returning home

In quantitative studies, we found fewer of the women who lived with their in-laws breastfed, compared with those who lived elsewhere. The difficulties they faced after discharge will be discussed later. Many women who lived with the in-laws (stage A: 9/13) said they wouldn't be bothered trying breastfeeding, because they would need to give up anyway.

A09-hospital *(Mixed feeding at discharge and 1 mo. Formula feeding at 3 mo. Lived with her in-laws).*

"My parents-in-law will take care of my baby after discharge... They have lots of experience, I only have to follow their instructions and everything will be fine...How can I breastfeed? I don't think I need to. My mother-in-law will take care of my daughter, I think formula is far more convenient. I am not bothered to try, I have to wean very soon anyway"

For motivated breastfeeding women in stage B, 4/5 said they were not certain how to continue to breastfeed once return home.

B09 *(BF for 10 mo. Plan to wean recently. Lived with her parents-in-law).*

"I started to feel nervous before returning home. I know it is going to be difficult for me to breastfeed in my husband's home, I can predict all sorts of interruptions."

Women's experience in locally accredited baby friendly hospital

Taiwan launched local breastfeeding promotion programme by copying and modifying the WHO/UNICEF's Ten Steps of Successful Breastfeeding and BFHI Assessment procedure in 1999. Informants in stage A were recruited from a locally accredited baby friendly hospital, and their experiences specifically concerning the interventions included in the Ten Steps were not allowed to be revealed in this document. I therefore present the data only from stage B women.

Most of the major hospitals in Taipei are accredited as baby-friendly; therefore, eleven out of 14 gave birth in baby friendly hospital.

Hospital has become more breastfeeding friendly after the initiative

Among the experienced mothers (5/14), four of them gave birth in baby friendly hospitals and all of them said the hospital practice has improved by all these years of breastfeeding promotion. B14 compared her postpartum experience 8 and 5 years ago, and demonstrated distinctive difference.

B14 *(Did not BF her older children (8 & 5 yr-old). BF her 3rd child for 8 mo. No plan to completely wean from breast.)*

"I gave birth to my previous children in the same hospital. You will be surprised all the birthing practices have not changed at all despite all the natural childbirth movements. I still had IV drip, episiotomy and things like that. Yes, one thing is changed is that I did not have enema this time.....I noticed there are several things have been different, especially after the child is born. They allowed me to hold the baby after birth, and encourage room-in. We did not have "room-in" 5 years ago. You know, everyone had to queue outside the nursery, waited for visiting hours. Then you saw they draw the curtains open, and your child is one of many lying in a cot. I wondered what if they put the wrong name card in front of my baby... Room-in is so wonderful; it is definitely a thumb-up practice. ...I also found that the nurses have more training in breastfeeding, though they may not practise optimally, they are on the right track. ...When I gave birth to my first two children years ago, they did not ask and fed them formula straight away. I noticed that the women next to me had different brand of formula, the one next door had another one. I was curious and asked the nurse. She said different companies sponsored different "beds". I did not realise that they had under-table contracts with many companies, and women were "assigned" to different brands....They dare not now! At least not so openly. I think the hospital has changed and is more likely to encourage breastfeeding. This is a good change and we should encourage this change."

<u>*Lack of reinforcement on the interventions promoting breastfeeding.*</u>

Though all women welcomed the more breastfeeding environment, nine out of eleven gave birth in locally accredited baby-friendly hospitals, and 9/11 mentioned that they did not get the care as stated in the Ten Steps, and some of the actions are merely symbolic, so that the staff can put a record in the chart.

B02*(Mixed feeding for 10 mo. Planning to wean.)*

"You know, it was really strange. I feel that they do it for assessment, not for real. I had a feeling that many of the staff are not genuinely happy about the ten steps, they just do it for assessment and accreditation. Many of the practices feel token to me. The spirit is not deeply rooted and the assessment criteria are not reinforced. "

This finding highlighted one of the underlying problems of the local breastfeeding promotion programme; that the government lowered the standard with the idea in mind that as long as the standards were achievable, it must be easier to buy the hospitals in and encounter less resistance. However, the lack of reinforcement and symbolic practices may be even more damaging to breastfeeding.

<u>*Being forced to breastfeed*</u>

After birth, some women felt that they were "forced" to breastfeed because the health professionals have the "obligation" and "pressure" to make everyone breastfeed. Six out of 25 in group A reported similar themes.

A19-1mo *(Mixed feeding at discharge and formula feeding at 1 & 3 months.)*

"...I was so tired and could barely open my eyes...the nurses kept coming into my room and checked if my milk comes in. They asked again and again if I can start to breastfeed...it was very annoying...they have kind of "competition"...they want good "performance record" that every woman is breastfeeding. Sometimes I had very young nurse coming in, and teach me a lot of things in a way I cannot understand. I wonder how can she teach me the right things? She is so young and I feel she is not familiar with the content (of breastfeeding) herself. I know it(breastfeeding) is good, but it was too much pressure...I am happy now, no one can force me to do what I don't feel like to.

Postpartum period

Things are getting better after discharge

Many women (10/14) in stage B and 4/25 in stage A stated that breastfeeding became easier after discharge. Those in stage A came up with this theme were those who breastfed longer and with more quantity (A05, 13, 17 and 23). There are several reasons presented by informants. Healing takes time; women in this study either had caesarean incision or episiotomy, and the wound became better when they were discharged. The national insurance covers 3-day hospitalisation for vaginal birth and 5 days for caesarean section as mentioned before. Milk coming in and no mother infant separation after they returned home is also a reason they felt things are improving.

A13-hospital *(Mixed feeding at discharge. Exclusive BF at 1& 3 mo.)*

"I failed (did not breastfeed) last time (first child) and my husband and I think we are going to breastfeed this time. It is not easy at the beginning even I did it once, see, I cannot sit evenly, it's painful down there (wound of episiotomy) and I just recovered from my headache, doctor told me that is because I had "a painless birth" (epidural/ spinal analgesia). I already told them that I want my daughter to be with me all the time, but she still needs to be back to the nursery once or twice a day for tests. I know they (staff) already fed her formula there (nursery), so she is not hungry when she is with me...I still breastfeed her...My husband and I insist on breastfeeding..."

A13-1 mo*(Mixed feeding at discharge. Exclusive BF at 1&.3 mo.)*

"My daughter came home with nipple confusion...I think this is the right description...she had a teat and pacifier in the hospital so that she was not able to open her mouth widely...a friend of mine came and helped us...she was so patient...we tried and tried...my husband and I were both amazed that a newborn baby can learn!...she finally surrendered, opened her mouth widely and started to breastfeed... it is a real challenge...I am lucky that have supporting people with me and am able to overcome the problem rather quickly. "

A13-3 mo *(Mixed feeding at discharge. Exclusive BF at 1& 3 mo.)*

"We are breastfeeding well, see (breastfeeding during the interview)! My son (older child)

is three, and is also breastfeeding...I do enjoy it and want to breastfeed forever... "

Social network

In this study, there are repeating themes about two major character influencing women's infant feeding behaviour. One is women's mothers-in-law, the other is their husbands.

Mother-in-law:

The majority of women (stage A: 19/25, stage B:12/14) mentioned that their mothers-in-law had negative influence on breastfeeding. Mother-in-law's influence started from hospitalisation and extended after discharge.

Some (stage A:12/25, stage B: 4/14) women also reported that their husbands either echoed their mothers or remained silent, or switched in between. It was described as "women's warfare, and men would better not get in" (B14).

B11 (BF for 11 mo.)

"It is so difficult to sustain (breastfeeding)....My mother-in-law is always quite difficult. My husband is the first son, and my son is her "Gold Grandchild" (the first grandson), her precious. At the beginning, I had little milk, colostrum is little anyway, but she was very anxious and kept saying that my son did not drink any drop of my milk, and would be starved to death. When my child cried, she cried with him and urged me to give him bottle. My husband was a coward; he is his mother's son, good son, and said nothing. .... We both agreed to breastfeed before the baby was born, but he is useless.... .I rang up my mom and see if she could help. My mom told me that I'd better to be careful, it is good to stand for my own idea that is good for my baby, but the benefits have to out-weigh of the risks of arguing with my mother-in-law. She (mother-in-law) was irrational..., I wanted my baby to be with me all the time, but my mother-in-law said" why bother; taking care of the baby is nurse's job, we paid for it already, if we take care of the baby by ourselves, the fee is not cheap anyway. "

For those who reported they ever asked their own mothers for support, several (stage A: 4/7, stage B: 2/8) said their mothers showed concern, but still remain distant and would not get involved. For the old generation, some parents still hold the belief that "a married daughter is like water that is spread out, you can never have her back"; therefore, they become very reluctant when their daughter asks for help.

<u>*Breastfeeding is perceived as a sign of poverty*</u>

Three decades ago, Taiwan had a breastfeeding rate as low as 5% at 3 month. That was a time when economic conditions started to recover, and the society became richer. And for some elderly people, they perceive breastfeeding as a sign of poverty, and they had no choice but to breastfeed. When their next generation started to have babies, some of them super-imposed their belief on to young persons, which led to resistance to breastfeeding. In this study, 4/25 in stage A and 3/14 in stage B said.

A23-1mo (Predominant BF at discharge. Exclusive BF at 1 & 3 mo.)

"...she (mother-in-law) said "we are rich now, we afford to buy the best formula for my grandchild...when we were young, we were poor and had no choice... milk (breastmilk) is thin and no nutrition". I don't want to argue with her anyway, it is very difficult to change old people's attitude."

Conflict between women and their mothers-in law

Many women (stage A: 21/25, stage B10/14) said they had a hard time with their mother-in-law, whether they breastfed or not.

***B13** (BF for 6 mo. Plan to continue to BF as long as her baby wants.)*

"My parents-in-law live far away and wanted to have their grandchild, so I agreed to live with them for a month. But my mother-in-law brought my son away immediately without telling me. I myself was having hard time with my son at that time, he had nipple confusion and both of us were still fighting. My mother-in-law very often dropped in my room unexpectedly and observed me expressing milk. When I am trying to feed my son, she always said: "Poor~poor~poor child! Your mother is so mean and hard minded! ". We had different opinions over many things, and I called my husband to bring me back (to our own home). We fight over this issue for three days and he finally agreed to bring me back that weekend. My parents-in-law were surprised when we left; I only spent 2 weeks with them. Now, they dare not to grab my son away from me, they have learnt to be polite, because they are afraid that I may not bring my child to them any more."

Live with parents-in-law

Thirteen out of 25 in stage A and 5/14 in stage B lived with their parents-in-law. In stage A, only A23 managed to continue breastfeeding while living with her parents-in-law. In stage B, all of the informants stated some difficulties when they live under the same roof and wish to breastfeed.

***B02** (Mixed feeding for 10 mo. Planning to wean.)*

"I have nipple erosion and have to be topless for some time. --- you know, it is almost impossible for me since I live with my husband's parents. Our room is not a private area and anyone can just walk in. I am very nervous when I am topless because my father-in-law or even my husband's brothers may come in at anytime. It is incredible!"

Child as public property, and his weight is the measurement of motherhood

In Chinese culture, people admire fat babies, the more chubby they are, the more likely their mothers are praised by the old generation. And for all breastfeeding women in this study, taking baby's weight as a measure of their milk and motherhood is a heavy burden.

***B04** (Predominant BF for 6 mo. Baby is 11 mo. Also BF a 3-year-old)*

"When I first returned home, my father-in-law brought my child away while I was sleeping. He wouldn't return my child to me because my mother-in-law said my son is skinny with watery stool. It must because I am breastfeeding and the child is malnourished. She said rudely " You can no longer breastfeed my grandchild. You shouldn't breastfeed any more". I was not allowed to hold my baby for 2 days; my father-in-law did not allow anyone to hold my baby because this may spoil him. When I saw my son the next evening, he cried dumbly, my heart was torn to pieces."

Husband

All women in this study stated that their husbands' attitudes towards feeding have strong implication on their behaviour.

A 19: hospital (Mixed feeding at discharge. Formula feeding at 1 & 3 mo.)

"I think breastfeeding is not a bad idea, just depends on if I can have enough milk. ... My husband supports whatever I want to ....He thinks breastfeeding is good, too. But he is worried that I may not be able to breastfeed and work at the same time. Plus, his mother lives quite far; he wants his mother to take care of our child. I cannot breastfeed if this is the case. I am ok with either, but I think he is right."

For women who breastfeed beyond 3 months (4 in stage A and 25 in stage B), all of them said that their husbands' support has been very important.

***B07** (Predominant BF for 6 mo. Also BF a 2-year-old.)*

"I am so grateful to my husband, he has been very supportive. His support is very important to me, so that I am able to breastfeed both of our children. My work is very time demanding, and he picks up our older kid every day (from day care nanny), and prepares dinner. All that I have to do, is get my young kid, go back home, relax and feed him. I cannot do it without him!"

Not all men are pro-breastfeeding. Some women said they gave up breastfeeding simply because their husbands did not like it. Some said the husband was worried about the shape of their breasts would be damaged due to breastfeeding, some women said the men had concerns about sexuality and urged them to wean.

***A15** (token breastfeeding at discharge and formula feeding at 1 & 3 months.)*

" I know a lot of women worried about their breasts... I mean become ugly and unattractive. I think that's men's concern rather than woman's... they hate it. My husband said if I let my child suck on my breasts during the night, soon my breasts would become very loose...he cares very much...and you know the physiology of lactation...when we have sex, milk leaks out, and he (husband) absolutely hates it...I had to give up breastfeeding anyway."

Source of information

Women received information from different sources. Book and Internet were the major sources for those wanted to have new information, and they tended to be better-educated women with stronger intention to breastfeed. Women also received information regarding pregnancy, childbirth and newborn care from their social networks. One distinctive source is mother-in-law. Everyone stated that their mothers-in-law had conveyed some idea to them, and much of this information had negative impact on breastfeeding. The formula feeders tended to take this more seriously (stage A: 18/21) while breastfeeders tended to ignore them (stage A: 3/4, 10/14).

> ***A16-1 mo.*** *(Token BF at discharge. Exclusive formula feeding at 1 & 3 mo. Lived with her mother-in-law)*
>
> *"My mother-in-law told me that when my husband was young, they were very poor. She had to help her husband farming after the one month confinement... Her milk was thin, not much nutrition in it; they had no other choice but to breastfeed. She is a respectable women...She said colostrum is poisonous, not good to baby because it has been stored in the mother's body for months, it is sour. I don't know whether it is true...She also told me that if I drink water and breastfeed, my baby will get stomach problem because the bad substance in the water goes from mother's milk to the baby. I cannot imagine not drinking water, also don't want my baby to get stomach problem, that is horrible...My mother-in-law also said breastfed babies grow slowly, they are lighter, not as chubby as those fed by nutritious formula."*

A16 stated many of the beliefs that older generation hold. In contrast, while receiving the same information, some women decided to ignore it.

> ***A17-3mo*** *(Predominant BF at discharge. Exclusive BF at 1 & 3 mo. Did not live with her in-laws).*
>
> *"My mother-in-law was very keen on helping me. I thank her but cannot agree with her on everything....She said it is not good to feed my child colostrum because it is very thin, even toxic, depends on the mother's bodily characteristic. Nonsense! She does not read books but I do, it is my responsibility to counteract this kind of misconceptions...She told me that I have to drink a lot of cow's milk to breastfeed, so that my milk will be as nutritious as cow's! I think she is worried because my child is not as "big" as she expected, she thinks that because my milk is not nutritious enough...Well, I can understand her anxiety, but everyone knows that breastfed babies have less risk of getting obesity, never mind."*

Need to express milk

Women need to express their milk for several reason, the number one reason is to "measure" it.

Volume of breast milk

Many people are obsessed to know how much milk the mother can produce, and how much the babies can get. This may include health professionals, women's family members and

women themselves. This obsession may lead to constant expressing and measuring of milk volume. In the survey, population, we found that for those who did any breastfeeding, 77% always feed via bottle.

***B09** (BF for 10 mo. Plan to wean recently.)*

"My parents-in-law were very nervous, they never knew how much milk my baby had. And one day, my mother-in-law came in when I was feeding and said: how do you know your child is having enough? I said, he gets off the breast when he feels enough, there is nothing to worry about. My mother-in-law replied: what kind of answer is this? How can you be so careless? She wanted me to express my milk out, and measure it, then feed by the bottle, so that everyone knows how much my child has. ... I did it just for once when my baby was 6 month old, ... of course I won't do this kind of stupid thing just to calm their anxiety..."

In this example, B09 clearly expressed her family's wish to know about the volume, and her not responding (B07, B12 both had similar experience.). But in some of the cases, women had to compromise (B01, B04), or sometimes they anxiously wanted to know how much milk they produced (22/25 in stage A,); being trapped into expressing and measuring the volume of milk.

***A10- hospital** (Token BF at discharge. Formula feeding at 1 & 3 mo.)*

"They (nurses) told me that my body would produce enough milk for my baby. How did they know? They never measured it (milk volume). My husband once came in and told me that the woman next to me just fed her baby 35ml of milk, and asked "how do you know how many ml our baby is taking if you breastfeed? " and this is a question as well. I just tried to express my milk. See! Not much! (she showed me her expressed breast milk in a bottle). It's about 10 ml. I think my baby is going to starve to death if he only gets my milk..."

<u>*Other people's need to feed the baby*</u>

Generally, breastfeeding directly from breasts is something only the mothers can do. This action often leaves others out if it is not handled properly. Two out of 25 in stage A and 12/14 in stage B mentioned that other family member's are jealous. Eighteen in stage A and 9 in stage B said that old people say "close mother infant attachment in early ages spoils the child". There is also an emerging theme (stage A: 23/25, stage B: 8/14) that other family members, especially mother-in-law, want to participate in baby care, and feeding is an important part of it.

***A20 -hospital** (Mixed feeding at discharge. Formula feeding at 1 & 3 mo.)*

"My mother-in-law is very happy this time, she holds my child all the time, and she has been treating me well. She wants to feed him as well, the nurse taught me how to express my milk in the bottle so that my mother-in-law can also feed him...I don't have enough milk, and we add some formula..."

Return to work

Apart from 2 housewives in stage B, all of the other informants said they have to express their milk during work and store it, so that they babies' daytime caregivers can feed them.

B01 *(BF with complementary feeds, baby is 7 mo old, no plan to wean yet.)*

"You know, my working hour is unstable (she is a journalist), sometimes have to do 12 hours a day. I have a good pump with me all the time....I always use the editing room which is always dark, and put a sign saying "time for milk" on the door so that others would not bump in, and I express milk there...we bought a new fridge after my baby is born, it is breast milk only. Baby's nanny strictly follows "first in, first out" principle" and that is not a problem. "

<u>*Bottle feeding of expressed breast milk*</u>

It had been constantly raised in the interview that many women prefer to use bottle to feed the expressed breast milk, rather than feed form the breast directly. For the working mothers, they have obvious reasons due to daytime separation; however, according to B09, a leader of a mothers' support group, and B10, an experienced social worker, who also helped women with breastfeeding issues in the community, both stated that women in Taiwan still cannot accept the "feeling" of baby suckling on the breasts. Though some apparent reasons are commonly cited, like separation, or baby's caregiver can feed them more easily. Both these two informants said the true reasons of choosing bottle are far more complex, and emotional. They both speculated that fear of exposure of body parts, uncertainly about the pleasure of breastfeeding, or even sexual elements play roles in this phenomenon.

B10 *(BF a 4-mo-old. Also BF a 5-year-old.)*

"I have met a lot of women not breastfeeding directly, you know what I mean, they nearly do exclusive bottle-feeding with breast milk. What is striking is that even housewives do it. They are with their babies all the time, yet, prefer to express and feed by bottle...I would tell you, it is very common. I think the reasons are many, I feel it is a choice of life style, rather than a choice of infant feeding. Praising motherly love and sacrifice is political and superficial, women have to take care of themselves first; only when are secure, they than take care of their children. It is human nature, and nothing wrong about it. And this is certainly true in breastfeeding. Many women in Taiwan, even now, still feel that to expose their chest to breastfeed, is utterly embarrassing and unacceptable. It would make breastfeeding much more difficult if they live with in-laws and husband's father and brothers may walk around...it would make breastfeeding a nervous and anxious business. They want to do the best to their baby; therefore, bottle-feeding is the only way...According to my observation, many men welcome bottle-feeding as well. You know, their psychology is to compete with the baby and to win their wives back. Though many of them would say "it is more convenient, so that I can get involved as well". Come on! Don't be stupid, they can change nappies, bath the baby and complementary feed for as long as they like, what kind of excuse is that? By doing this, men still perceive that their wife's breasts are "un-used", and still belong to them."

Reasons of discontinuation of breastfeeding

The perceived problems women reported can also be "exits" delivering them out of the sense of guilt of not to breastfeed. The common reasons were:

- Perceived inadequate milk (stage A: 19/25)
- Baby's poor suckling (stage A: 16/25)
- Breast problems (stage A: 17/25)
- Perceived poor weight gain (stage A: 19/25)
- Jaundice (stage A: 10/25)
- Breast milk leads to upset stomach (stage A: 3/25)
- Family history of allergic disorders (stage A: 5/25)

The aforementioned themes are illustrated as below:

Perceived inadequate milk

A01-1mo *(Mixed feeding at discharge and 1 mo. Formula feeding at 3 month.)*

"I think I have little milk (grimaced), my breasts are not large...I don't know, but I think I really have to feed some bottles otherwise my child will starve"

Baby's poor suckling

A10-1mo *(Mixed feeding at discharge and 1 mo. Formula feeding at 3 mo)*

"He (child) would not suck on my breasts, he always sucks for once or twice and gives up. Sometimes he even does not take my breasts. I think he does not like it. In hospital, they (nurses) told me that the baby would open his mouth widely, but my child does not...Feed by bottle is less of a problem, and you can assure that he gets some milk"

Breast problems

A12-1mo *(Token BF at discharge. Exclusive formula feeding at 1 & 3 mo.)*

"It hurt me badly, my nipples were bleeding, and probably I did not prepare my breasts enough so I had problems. I think it is not safe for my baby to drink milk mixed with my blood. I thought of breastfeeding, but I could not, I cannot feed my child milk with blood or some bacterium in it."

Perceived poor weight gain

A14-3 mo *(Mixed feeding at discharge and 1 mo. Token BF at 3 mo.)*

"He put on weight very slowly, even lost some weight when we were in hospital. My husband and I were both nervous. The first week after discharge, he only gained about 150-200g. (interviewer: in one week?)Yes, in about one week. My mother-in-law and my mother kept

asking how heavy is he. I think we have to do something, or my child will be too light. Apart from breastfeeding, we generally have 5-6 top up feeds per day, and one feed before going to bed. He is gaining weight very well now."

Jaundice

***A19-1 mo** (Mixed feeding at discharge. Exclusive formula feeding at 1 & 3 mo.)*

" He became very yellow at the 3rd day, as yellow as a "cucumber" (small yellow melon in Chinese). Doctor was worried, and told me that a lot of breastfed babies get jaundice, and wanted my baby to stay in the hospital for several days to get jaundice down. So I went back home first, and he was discharged after 5 days"

Breast milk leads to upset stomach

***A24-1 mo** (Mixed feeding at discharge and 1 mo. Token BF at 3 mo.)*

"My child is so unsettled, and vomits from time to time...It is dreadful! He would not sleep during the night, and my mother-in-law said it is because he has stomach-ache. I eat a lot of sesame oil chicken and pig knuckle with peanuts, I think it is my foods that makes my milk not suitable to my child...I have to eat these foods during confinement, and feeding some formula is going to help..."

Family history of allergic disorders

***A20-1mo** (Mixed feeding at discharge. Exclusive formula feeding at 1 & 3 mo.)*

"I am allergic to some foods and dust, I don't want my child to suffer. I would do everything to protect him from getting this nasty condition whatever the cost. I got something (promotional material) when I attended antenatal education, now they produce pre-digested formula, and there is also a research showed this formula decreased the risk of having allergy. The formula is a little more expensive though, anyway, as long as it is the best of my child, money is not an issue."

Work and breastfeeding

Time and space to express milk

For working breastfeeding women, allocating time and space to express and store milk, is an important task. In this study, all women combining work and breastfeeding have expressed their concerns. In stage A, three out of four managed to continue breastfeeding are working mothers, and there are 2 housewives in stage B.

***B11** (BF for 11 mo.)*

"There are 7 people in my company altogether: 5 employees plus boss and his wife. They told me not to use work hours to express milk, and allowed me to express after work last

week. This week, I am physically and emotionally depressed, very much depressed... "

A few moments later

"My baby is 11 months old, it means that I have been expressing milk for 9 months. I only dare to express during lunch break and right after work, about 45 minutes altogether. But I always work 1 hour extra in order to return the time used to express milk. Think back, they already showed signs right after my baby was born. My boss's wife told me that only colostrum is important, and this is what her doctor told her. After some time, she said 3 months is definitely long enough, and prolonged breastfeeding not only does not help, but harms both mom and baby. Once my child was sick and I had to have one day off, her comment was: breastfeeding has no benefit, your baby gets sick anyway, formula has immunity in there, and more convenient. I was very sad, and felt that breastfed babies are not "allowed" to get sick, but it is normal for formula fed baby to get ill.

I know that I have legal rights to express milk, but I cannot stand firm to protect my rights since I need the job after all. I cannot afford to lose the job simply because I need to express milk. My direct officer had comments preventing me from taking time off to express milk when my child was 3 months old. I told him right straight that I will not use a single minute, but I will still do it during lunch break. I can feel my milk volume is decreasing. I have to rush back home every day, let my child rescue me. "

Women have to be responsible to their own choice

When women fought their family and won the "women's war", it is common that they have to stand on their own without mother-in-law's endorsement, or seek support outside the family (2/4 in stage A and 9/14 in stage B).

***B04** (Predominant BF for 6 mo. Baby is 11 mo. Also BF a 3-year-old, live with husband's filmily)*

"(When I returned to work) it was chaos. I am always in a hurry, and the pressure is tremendous. I have so little time and also have to express milk for my child. I feel very tired. Why it is so difficult to be a woman? I wake up at about 7 o'clock in the morning, and have to dash to work. I cannot rest during lunch break because I have to express milk. After work, I have to rush back home. It is quite a long distance (between home and work), I have to take taxi all the time. ...I was lucky because I have my husband's support, but you know, sometimes when I return home feeling very exhausted, my mother-in-law would say ' that is your own choice, I told you not to bother yourself (to breastfeed) so much and you did not listen to me!'"

Discrimination on breastfeeding women in the work place

Expressing breastmilk during working hours is considered as "wasting working time" in the work place. All women knew that they have a legal right to have 1 hour per day for expressing milk, none of them dared to take it seriously. And all of them reported different levels of disorientation against their work performance due to breastfeeding.

B06 *(BF with complementary feeds, baby is 14 mo old, no plan to wean completely.)*

"I had a "B" score (ways to evaluate employee's working ability, A++ is the highest rank and C is fail) last year and I had my baby last year. To be honest, I feel it is not fair, I think my work performance was as good as rest of the others, but... I thought of complaining, but....hey, forget about it!

Although the law says I can have 1 hour per day to express milk, my boss thinks that I am not working hard enough and have delays. And many of my colleagues... well, it's not going to help. If I tell others that I am expressing milk, it's going to add myself more trouble."

<u>*Pressure to change job or working status*</u>

Apart from being unfairly evaluated, 3 in stage A and 8 in stage B mentioned that people in their work place actually said they should consider changing job or apply for part time job. Because they are" *spending a lot of time breastfeeding, and do not deserve as much income as the others (B14)*".

B13 *(BF for 6 mo. Plan to continue to BF as long as her baby wants.)*

"My boss always thinks that I spend a lot of time doing my private things, a good friend of mine suggested me not to breastfeed, she was very good minded and said that there are a lot of things that shouldn't be said too frankly. My baby is 3 months, and should have adequate nutrition from breastmilk. She then implied that I have a good paid job, rather than that kind of 20-30 thousands per month job (about 330-500 pounds). It is important to me to find a nanny who is willing to take care of my baby for longer period (she implies that I should work for extra time, since I always "waste" 1 working hour to express milk). She said frankly :" I know colostrum is good, breastfeeding for 3 month is enough, we all have our own children and are family centred as well. But if you keep doing this, what would other colleagues think? We all have similar wages with similar position, if you really want your family first, you should change to a lower paid job, or go back home and forget about your job."

<u>*People's critiques and comments about childcare*</u>

Since breastfeeding is not common, especially after returning to work, those who still continue to breastfeed are considered as rarity, and face more peer pressure as being a new mother. All working informants in both groups have come up with the same theme. Three in stage A, and 9 in stage B said they feel embarrassed and stressed when their baby gets sick or does not grow as "well" as those fed by formula. This invites even more criticism and people may tease them.

B07 *(Predominate BF for 6 mo. Also BF a 2-year-old.)*

"I have observed an interesting phenomenon. Colleagues who do not have young children (with older children or unmarried) are more relaxed, but those have young children are full

of critiques to me!... Because they all fed their babies formula. For example, ...like "Don't you feel tired, are you sure your breast milk has enough nutrition? Or "your baby is not allergic!" or" Ha, see! Breastfed baby still gets sick, it's not really better anyway!" or "I am not as lucky as you are, your husband is so supportive and you got a good nanny". Some of their babies are not with them (live in other towns and cared by grandparents) most of the time, or the nanny or the family members are not willing to feed expressed breast milk. I have to be very low key not to irritate others. If people ask, I am happy to share my experience, but I dare not "promote" breastfeeding publicly. Every parent has different attitudes towards baby care, and I think it's just too "spicy" for some of the parents to learn about the effects not breastfeeding."

This example clearly demonstrates office dynamics surrounding breastfeeding women. For women of childbearing age, it is fair to say that they all know "Breast is Best", but still few of them breastfeed. B08, an experienced leader of mother-to-mother support tried to explain the circumstances most women face in their office.

***B08** (BF for 5 mo. Just started adding complementary foods.)*

"I think that there is a sense of guilt that is at work. Most women know that breastfeeding is important, but most of them do not breastfeed. If you go to a place where no one is breastfeeding, you have a sense of relief. But if some one is breastfeeding and sits next to you, it's different. They don't mean to attack, they self defend by attacking or questioning breastfeeding women. I think that's why most of the breastfeeding mothers have to be very cautious about what they say in the work place."

Positive experiences of breastfeeding

All breastfeeding women have mentioned their good experiences about breastfeeding.

***B13** (BF for 6 mo. Plan to continue to BF as long as her baby wants)*

"I felt (to express milk) embarrassed at the beginning, but thinking of my beautiful daughter, I do this for her nutrition, there is nothing to feel ashamed about, and I got used to it gradually."

Feel own body's function and autonomy

Some women used to be very distant from their own body, and have a sense of connection when they breastfeed (2 in stage A, 6 in stage B).

***B10** (BF for 6 mo. Plan to continue to BF as long as her baby wants.)*

"I am transformed into a milk tank myself! It is marvellous! Someone can feed on me, and be satisfied. Someone thrive on me solely as source of nourishment. This is an interesting and wonderful feeling. I feel like walking on air, floating.... I am proud of myself. I am surrounded by a kind of intimacy, how to describe?... "Fulfilled" is the word. During feeding, that hour is definitely heaven on earth. I always relive it. "

Transforming negative breast experience

Some women perceive their breasts as either too big, or too small, and wanted to hide them. They (1 in stage A, 4 in stage B) all said that breastfeeding transformed their negative breast experiences into positive.

***B04** (Predominant BF for 6 mo. Baby is 11 mo. Also BF a 3-year-old.)*

"I always had had negative feelings about my breasts since I wan 12. Because I have a pair of large breasts, I dared not to run fast in physical exercise classes, I was always the last one. I felt my breasts were bumping up and down; it was very uncomfortable and embarrassing. The more I cared about it, the more I felt my breasts caught everyone's attention. During adolescence, my breasts grew even larger, and were attacked by older men. I had to bend my back to hide my breasts; I could not admire my breasts at all. I am not a lesbian, but when I was 20, I bought lesbian type of bra to hide my breasts. I envy that kind of thin girls with little breasts. They have ample choices of bra, but I have very limited choice, fancy bras make my breasts look larger, I hate them. When I started to have boyfriends, I was afraid that my large breasts caught the boy's eye. Perhaps I am too conservative, I had never liked my breasts. It's until my baby was born, I breastfed him with my own breasts. I started to realize the value of having breasts. My breasts are filled with sweet and precious milk that satisfy my child, and make me feel proud. Breastfeeding gives the meaning of my breasts, and liberated my breasts!"

Sense of confidence and capability

Some (2 in stage A, 10 in stage B) women described themselves as "timid", "shy" and " afraid to voice out" prior to having a baby, and childbirth and breastfeeding have made them "much stronger woman" and "dare to fight for my self" (A 13).

***B02** (Mixed feeding for 10 mo. Planning to wean.)*

"I was small when I was girl. I was quite short compared with my peers. I had my first menstruation when I was 16 years old, it was very late. My mother thought that there must be something wrong with my reproductive system, and was very worried if I am infertile. I felt very weak, and it was a great relief when I had my first period. ... My friends always joked at me, and said that I am not mature, not developed. I had little confidence of my self and wondered if any man would like me. When I got pregnant, I told my parents that I am not infertile, that I did it."

A few minutes later

"When I first put my baby to the breast, it was so marvellous, I felt very warm, and I saw my baby smiled and contented. I know that I am a fully capable woman, and a mother. I am able to bear a child, to give birth and to breastfeed, I am capable to do anything now."

Breastfeeding brings sexual feelings

Women rarely talk about sex openly. In this study, 7 in stage B mentioned about breastfeeding and sexuality. As oxytocin levels increase during feeding, the sense of relaxation has similarity as oxytocin peaks at orgasm.

***B09** (BF for 10 mo. Plan to wean recently.)*

"Breastfeeding is sexual. I don't know if this is ok, but it feels like "multi orgasm" during one feed, of course not as passionate as having sex....you know, it feels good, I am relaxed, very comfortable. I think I need my husband less, I guess he is jealous...it does feel very good, smooth, and comfortable. "

Breasts were sex objects, and breastfeeding changed the icon

Several (8 in stage A, 5 in stage B) women mentioned that they and / or their partners had concerns about breast shape. And some of them (6 in stage A, 2 in stage B) said their husbands wish them not to breastfeed because that might change their breasts.

B07 *(Predominate BF for 6 mo. Also BF a 2-year-old.)*

"My husband does not want me to breastfeed, he said it changes the shape of my breasts, and makes me less attractive to him. I don't know, it is difficult to me. My breasts grew bigger during pregnancy, and I had to buy special bras. My husband likes my "enlarged" breasts but does not like my "milk producing " breasts. During sex intercourse, my milk leaks and he is irritated. "

8.5 Summary:

The tradition

Traditional postpartum practice continues to influence women's postpartum life in modern society. Women's feelings and acceptability of this tradition vary. Some perceive it is a good tradition that has positive influence on both maternal and child well-being; while some do not "believe" in it and feel the behavioural and dietary restrictions uncomfortable. The older and younger generations have different perceptions of the tradition. While the older generation tend to perceive the traditional practice as important, younger women are more likely to partly adopt it and perceive it as less important. The different perceived importance of the tradition sometimes provokes conflict, especially between mother and daughter-in-law. There is a generation gap in that the old women said the traditional practice is to encourage bonding and breastfeeding whereas the young women said the traditional restrictions make breastfeeding difficult. It is a reasonable rationale that the original spirit of the tradition was to encourage breastfeeding. Before the era of breast milk substitute, breastfeeding was the only way to optimise the chance of survival of the species. However, in modern society where infant formula is everywhere, the essence of the tradition can be distorted. People over-emphasize on "resting", which was a luxury for women in agricultural society, but a "must" for women in industrialised society who have had very pampered lives. In a

low-fertility, little-breastfeeding society like Taiwan, to encourage the new mothers to rest as much as possible makes both the old and the young women happy. The young women can be relieved from the duty of childcare, while the old women are in charge. By doing this, the old women both enjoy the newborn infant and create a sense that their appearance is necessary and important. However, when the young women intend to breastfeed, the mutualistic relationship becomes conflict. This is best revealed by the stage B interview that the motivated breastfeeders identified their mother-in-law as problematic. And this finding is also confirmed by the surveys (see next section) that living with in-laws and mothers-in-law are strong factors against breastfeeding.

Prepartum period

Though it is common, especially for the first-time mothers to attend antenatal education, the current antenatal education seems not to be effective in equipping women to breastfeed. Moreover, it is used by formula companies as means to collect expectant mothers' information and contact them after childbirth.

Birth experience

In general, women expect before delivery that they will receive all sorts of intervention during childbirth. The consensus is that though giving birth is a painful experience by "nature's default", it is "risk free". The lack of risk communication also explains high litigation rates of obstetricians in recent years in Taiwan. Women are more forgiving in early days after delivery and full of thankfulness to the health professionals because they have "healthy and normal child" after all. However, the more negative memory flashes back after they physically recover from childbirth. The survey also confirms that the degree of satisfaction of intrapartum care decreases after 3 month (data not shown). The after-effects of some medical interventions especially episiotomy, epidural and CS reduce women's ability to initiate early breastfeeding and this delay very often leads to later breastfeeding difficulties.

Hospital experience

Though hospital practice has improved before and with the local breastfeeding promotion initiative, it is still less than optimal, sometimes detrimental to breastfeeding. Separation is quite common and 24-hour room-in is rare. This is further complicated by the spatial allocation of the maternity ward and the nursery for those who "cannot" or "don't choose" 24-hour room-in. Some women find it difficult to "travel" from their room to the nursery because the two places are quite far, or even on different floors. Nurses' "pushy" attitudes plus ineffective communication skills make some women dislike breastfeeding. Women are less capable of performing normal tasks in the early days after birth, which is an extension of medicalised birth. Some practices come to fill the gap like pre-lacteal feeds and top-up feeds of formula, making breastfeeding more difficult. This is like a vicious cycle and partly explains the sharp decline of breastfeeding after discharge.

Going home and family influence

The dynamics of two women's power-game appears to be complicated, and infant feeding is

one of the battlegrounds. In this study, mother-in-law is overwhelmingly inhibiting to breastfeeding, and her impact starts during hospitalisation and she continues to be influential after discharge. The majority of husbands are supportive of breastfeeding with few exceptions, and they are equally influential. It seems that breastfeeding women tend to mention their husbands more, while formula feeders are less likely to do so. Living with husband's family also makes breastfeeding difficult. Lack of privacy and in-law's anxiety over the newborn seriously interferes women's postpartum life. And this echoes the survey findings that women who live with in-laws are less likely to breastfeed.

8.6 Conclusion:

To conclude, this chapter presented women's perspectives including their experience around childbirth, before discharge, after going home and return to work by their own words. Many of the narratives were very revealing and for some women, it was their only chance to talk about their own feelings and experiences. Moreover, the constant comparison method provided us an insight of how similar themes occurred across different cases, which will be further triangulated by quantitative methodologies in chapter 9.

In a society like Taiwan, where the qualitative findings have been often despised by doctors as "individual cases" or "nonsense", it is important to have a quantitative sense of the factors influencing women's feeding behaviours. Thus, the next chapter aims to investigate the statistical relationships between potentially influential factors (see 9.4) of breastfeeding identified by the qualitative phase and the feeding behaviours at discharge, at 3 months together with change in pattern of breastfeeding (see chapter 9).

9. Results: the quantitative study

9.1 Introduction

This survey was conducted among 504 women who were recruited from 2 hospitals committed to promote breastfeeding. I collected information on a wide scope of questions and only present results that are relevant to the research aim. Detailed percentages of responses to each question are listed in the questionnaire in Appendix 4. Women were interviewed face-to-face before discharge and by telephone at 3 months postpartum. In this chapter, association of three types of baby feeding, complete formula (FF), mixed feeding (MF), and exclusive breast-feeding (EBF) with various risk factors and other possible determinants with correlates shown in a series of tables. Some tables relate to increase and decrease of breastfeeding; these are defined in the table footnotes. The associations are shown in terms of percentages and in terms of odds ratios from logistic regression, both simple (UOR) and adjusted (AOR).

The two hospitals had about 60-70 births per month in 2003 [299]. During the time of data collection, there were altogether 579 births and 509 (87.9%) met the inclusion criteria (see previous section) and data from 504 women were included in this study. The most common reasons for being excluded from this study were complicated birth or infants born with compromised medical condition. We recruited women over a period of 18 weeks (table 7.1) and according to the calculation of the sample size (see previous chapter), we needed 500 women to have adequate power.

9.2 Background

This group of women had characteristics that are similar to national statistics. Since the study sites were in the city area, this group is relatively well educated and the majority of them had jobs. There are about 60% first time mothers, which is a reflection of low fertility rate.

Table 9.1: Background characteristics of study population (n=504)

Variable	**Description**
Age	27.6 ±3.9 years (mean ± SD) Range: 20-39
Parity	1.5 ±0.65 (mean ± SD) Range: 1-4
Variable	**Percentage (%)**
Ever gave previous birth	40.5
Education ≤ Junior high ≤Senior high Institute of technology University / College Postgraduate	 2.4 22.6 35.7 34.5 4.8
Employed	76.2
Live with husband's family	49.2
Breastfed [a] previous child	20.6
Previous breastfeeding[a] duration ≤1 mo 1-2 mo 2-3 mo ≥ 3mo	 66.7 16.7 0 16.2

[a]: *Means any breastfeeding.*

9.3 Patterns of infant feeding behaviours

The overall percentages of the three feeding modes at discharge and 3 months are in Table 9.2

Table 9.2: Types of feeding at discharge and 3 months (n=504)

Discharge			3 Months		
Type of feeding	Number	%	Type of feeding	Number	%
Discharge			3 months		
Formula feeding	186	36.9	Formula feeding	274	54.4
Mixed feeding	282	56.0	Mixed feeding	187	37.1
Exclusive breastfeeding	36	7.1	Exclusive breastfeeding	43	8.5

To investigate the factors related to changes and lack of change in feeding behaviour during discharge and 3 months, I created variables of "decrease", "unchanged" and "increase" in breastfeeding based on the logic of table 9.3. Analyses of these variables helps the understanding of the patterns and characteristics related increase, decrease or not changing in breastfeeding / infant feeding behaviours that may be useful information for further policy formulation.

Table 9.3: Change of feeding between discharge and 3 months.

Feeding at discharge	No	Direction of change	No with change, or not changing, as indicated	%
All	504	Unchanged	324	64.3
Mixed feeding & exclusive breastfeeding	318	Decrease of BF	129	40.6
Formula feeding and mixed feeding	468	Increase of BF	51	10.9

Routes of feeding breast milk at 3 month

According to anecdotal information, and confirmed by this study (see above and later section) many breastfeeding women in Taiwan feed expressed breast milk by bottle rather than feed directly from the breast.

Table 9.4: Routes of feeding breastmilk and mixed or exclusive breastfeeding at 3 months (n=229)[A]

	Always from the breast (No / %)	In between [B] (No / %)	Always feed from the bottle (No / %)	Total
Mixed feeding	0 (0.0)	24 (12.8)	163 (87.2)	187 (100.0)
EBF	2 (4.8)	26 (61.9)	14 (33.3)	42 (100.0)
Total	2 (0.9)	50 (21.8)	177 (77.3)	229 (100.0)

A: Include mixed feeding and exclusive breastfeeding only. The data from FF was not included.
[B]: Means" feed from the breast when my baby is with me, and feed from the bottle when we are separate".

At the time of interview, almost all working women were still taking maternity leave; therefore, the separation factor due to maternal work had not taken place in this study. Women always breastfeeding directly from the breast (though only two in number) are more likely to exclusively breastfeed ($p<0.001$, Fisher's exact test).

Table 9.5: Importance of current feeding routes among mixed feeding and exclusive breastfeeding (n=229)[A] at 3 months.

Feeding method	Important (%)	Somewhat important (%)	Not important (%)	P value
Convenient for me				
Mixed feeding	83.4	16.6	0	P=0.69[B]
EBF	88.1	11.9	0	
Total	84.3	15.7	0	
Convenient for baby's caregiver				
Mixed feeding	86.1	9.1	4.8	p<0.001 [B]
EBF	64.3	28.6	7.1	
Total	82.1	12.7	5.2	
Possible to measure milk volume				
Mixed feeding	87.2	9.6	3.2	p<0.001 [B]
EBF	42.9	28.6	28.6	
Total	79	13.1	7.9	
Others can feed baby as well				
Mixed feeding	66.3	29.4	4.3	P=0.88
EBF	71.4	21.4	7.1	
Total	67.3	28	4.8	

[A]: Include mixed feeding (n=187) and exclusive breastfeeding (n=42) only.
[B]: Fisher's exact test

Table 9.5 shows the importance given by the respondents to the feeding routes currently practised at three months. Mixed feeders were more likely to report that feeding via bottle is important because it is more convenient for the baby's caregivers (p<0.001, Fisher's exact test). They were also more likely to report that feeding via bottle is important because they (or the caregiver, i.e. nanny, maternal or paternal grandmother) were able to know the volume of milk (p<0.001, Fisher's exact test).

9.4 Factors influencing breastfeeding

Potential factors were classified into the following categories:

- Socio-demographic factors (e.g. age, education)
- Attitudes of significant others (e.g. mother-in-law, husband)
- Sources of information (e.g. book, internet)
- Antenatal factors (e.g. antenatal education)
- Intrapartum factors (e.g. mode of delivery)
- Postpartum factors (e.g. rooming-in)

Hierarchical conceptual framework

A hierarchical conceptual framework of levels of potential explanatory factors based on the qualitative results and the literature and effect modifiers related to breastfeeding is as below:

Figure 9.1: Conceptual hierarchy framework

Level	Variable
1	Socioeconomic variables (age, education and living with in-laws).
2	Perceived attitudes of significant others (mother-in-law, husband & health professionals)
3	External sources of information (book, internet, health professional& antenatal education)
4	Intrapartum variables (mode of delivery & epidural)
5	Postpartum variables (skin contact & room-in)
Breastfeeding (Outcome)	

Introduction

The results are presented in blocks for group of factors. In general, there are 4 tables in each block:

1. Percentage by type of breastfeeding at discharge and 3 months. Denominators are the total population in each stratum and percentages of different feeding groups are shown for each level of the factor.
2. Percentage of change: Increase in breastfeeding was defined as from discharge to 3 months, women shifted from formula feeding to either mixed feeding or exclusive breastfeeding, and from mixed feeding to exclusive breastfeeding. Those who were exclusive breastfeeding at discharge were excluded from the denominator because they could not increase in breastfeeding anymore. Decrease of breastfeeding was defined from discharge to 3 months, women shifted from exclusive breastfeeding to either mixed feeding or formula feeding, and from mixed feeding to formula feeding. Formula feeding at discharge was excluded from the denominator. Unchanged means the feeding method remained the same between discharge and 3 months. Note that the denominators are

different from the first table (see table 10.3). The denominator of increase is the number of formula feeding and mixed feeding at discharge. The denominator of decrease is the number of mixed and exclusive breastfeeding at discharge. The denominator of unchanged is everyone.

3. Odds Ratios (ORs) for any breastfeeding
   i、 The unadjusted ORs (UORs) corresponding to the first table showing the crude relationships.
   ii、 The adjusted ORs (AORs) are adjusted for different levels of variables as indicated in the footnotes under each table, broadly following the conceptual framework of fig 10.1.
4. Odds Ratios (ORs) for change of breastfeeding
   i、 The unadjusted ORs (UORs) and the adjusted ORs (AORs) which are adjusted for different levels of variable as indicated in the footnotes.

In these tables, if there are cells having zero(s), which generates problem in logistic regression, the OR is expressed by [--]. When numbers in some subgroups are small in the 2nd and 4th tables in each block adjustments can lead to models that are unstable and the AOR is not informative; then they are expressed as [‖].

Statistical testing of changes in increase or decrease of breastfeeding with individual risk factors was carried out by ordinary chi-squared tests for unadjusted results and by testing coefficients in logistic regression for adjusted results. However, testing differences between rates of increase or decrease was not carried out because the denominators for increase and decrease were partly the same, and partly different women.

The statistical analysis was done using STATA software. I used the Chi-square test to obtain p-values when comparing percentages, or Fisher's exact test when indicated.

Sociodemographic variables

Table 9.6: Sociodemographic variables and the relationships between types of infant feeding. (n=504)

Variable	No	At discharge (%)				At 3 month (%)			
		FF*	Mixed*	EBF*	P	FF*	Mixed*	EBF*	P
Age					<0.001				0.913
20-24	114	31.6	63.2	5.3		53.5	38.6	7.9	
25-29	252	47.6	47.6	4.8		56.0	36.1	7.9	
30+	138	21.7	65.2	13.0		52.2	37.7	10.1	
Education					<0.001				<0.001
High school	126	66.7	33.3	0		86.5	10.3	3.2	
Inst. of technology	180	46.7	53.3	0		56.7	40.6	2.8	
≥University	198	9.1	72.7	18.2		31.8	51.0	17.2	
Breastfed older child [A]					<0.001				<0.001
Yes	42	0	71.4	28.6		28.6	47.6	23.8	
No	162	48.1	48.1	3.7		61.7	34.0	4.3	
Live with husband's family					<0.001				<0.001
Yes	248	63.3	36.7	0		92.3	7.7	0	
No	256	11.3	74.6	14.1		17.6	65.6	16.8	

**FF: formula feeding. Mixed: mixed feeding. EBF: exclusive breastfeeding*
[A]: Multiparous women only.

Table 9.6 shows breastfeeding increased with higher levels of education, both at discharge and 3 months. Breastfeeding at discharge was most common among women aged more than 30 or less than 25. Formula feeding was more common in the 25-29 age group at discharge, but not 3 months. No women living with in-laws exclusively breastfed. There is a very strong tendency to formula feeding among them, at discharge and 3 months. It was mentioned earlier that houses and apartments are very expensive in Taiwan especially in the city area, and it is common for young couples to live with the husband's family during the early days of their marriage, and move out when they can afford to buy their own home. In this study, nearly half (248/504) of the women lived with their in-laws. There are no formal statistics for the recent 5 years available but this figure is said to be compatible, but slightly higher than the average of the Taipei metropolitan area [310]. The reason could be that some women moved to their in-laws' home once when they got pregnant, or when the pregnancy progressed to the later trimesters, and they stayed with their in-laws for several months before delivery and also after delivery. Therefore, there could be an over-report of living with in-laws. However, the impact of this possible over-report on the analyses of this study is not likely to be problematic because we aimed to look at the impact of living with in-laws before birth and after discharge and the situation as revealed in the data should reflect the picture in a way that is closer to the study purpose.

Table 9.7: Relationships between sociodemographic variables and change of breastfeeding behaviour between discharge and three months.

Factor	Less BF[1]			Not changing[1]			More BF[1]		
	No at risk	% decrease	p	No at risk	% unchanged	p	No at risk	% increase	p
Age			0.50			0.307			<0.001
20-24	78	35.9		114	70.2		108	5.6	
25-30	132	40.2		252	61.9		240	17.9	
30+	108	44.4		138	63.8		120	1.7	
Education			0.03			<0.001			0.002
High school	42	59.5		126	77.0		126	3.2	
Inst. of technology	96	37.5		180	68.3		180	11.7	
≥University	180	37.8		198	52.5		162	16.1	
Breastfed older child[4]			0.90			0.007			0.46
Yes	42	42.9		42	47.6		30	13.3	
No	84	41.6		204	69.8		156	9.0	
Live with husband's family			<0.001			0.04			<0.001
Yes	91	85.7		248	66.1		284	2.42	
No	227	22.5		256	62.5		220	20.5	

[1]:More breastfeeding was defined as from discharge to 3 months, women shifted from formula feeding to either mixed feeding or exclusive breastfeeding, and from mixed feeding to exclusive breastfeeding. Those who were exclusive breastfeeding were excluded from the denominator. Less breastfeeding was defined from discharge to 3 months; women shifted from exclusive breastfeeding to either mixed feeding or formula feeding, and from mixed feeding to formula feeding. Formula feeding at discharge was excluded from the denominator. Not changing means the feeding method remained the same between discharge and 3 months.

[4]: Multiparous women only.

In table 9.7 (and table 9.11, 9.15, 9.19, 9.28 and 9.30), the women are considered in three overlapping groups, those who started with some breastfeeding and therefore at risk of decrease, the complete group who were at risk of change in either direction, and those who started short of exclusive breastfeeding and at risk of increase. Because these groups are not fully comprised of the same women, the percentages with decrease, no change and increase need not add to 100% and as a rule do not.

Overall, the majority of women remained unchanged between discharge to 3 months. Those aged 25-30 were more likely to increase in breastfeeding. The most educated women were more likely to increase in breastfeeding, while the least educated group tended to decrease in breastfeeding most. Living with in-laws is a strong factor associated with much more decrease and much less increase in breastfeeding.

Table 9.8: Odds ratios for the social demographic factors and any breastfeeding[1] at discharge and 3 months

	Discharge				3 months			
Variable	UOR[†]	95%CI	AOR[a]	95%CI	UOR	95%CI	AOR[a]	95%CI
Age								
20-24	0.60	0.34-1.06	0.54	0.25-1.18	0.95	0.57-1.56	1.83	0.63-5.33
25-30	0.31	0.19-0.49	0.21	0.11-0.41	0.86	0.57-1.30	1.29	0.57-2.92
30+	1		1		1		1	
Education								
High school	0.05	0.03-0.09	0.22	0.10-0.47	0.07	0.04-0.13	0.13	0.05-0.36
Inst. of technology	0.11	0.06-0.20	0.17	0.08-0.34	0.36	0.23-0.50	0.22	0.09-0.50
≥University	1		1		1	1	1	
Breastfed older child								
Nulliparous[A]	1		1		1		1	
Yes	--	--	--	--	2.93	1.45-5.95	0.47	0.16-1.37
No	0.60	0.41-0.89	0.86	0.49-1.50	0.73	0.49-1.07	0.74	0.37-1.48
Live with husband's family								
Yes	1		1				1	
No	13.50	8.48-21.49	12.6	7.09-22.41	56.51	32.03-99.72	45.1	32.4-83.1

UOR[†]: Unadjusted Odds ratio
[1]: Outcome was defined as any breastfeeding (mixed feeding and exclusive breastfeeding) at discharge or 3 months.
--: Equal or more than one zeros in the logistic regression model and failure to predict. Or the variable does not fit into the regression model.
[a]: adjusted for age, education, live with parents-in-law and feeding history(Level 1)
[A]: Nulliparous are shown here due to the lack of baseline among multiparous women.

Table 9.8 shows the percentage in table 9.6 re-expressed as unadjusted odds ratios (UORs) and odds ratios with adjustments (AOR). Table 9.9 does the same for the result for table 9.7.

In table 9.8, before and after adjusting for the level1 variables (see fig 9.1 and the previous section for detail), less educated women tended to breastfeed less on discharge; moreover, those who did not live with in-laws were more likely to breastfeed, both at discharge and 3 months.

Table 9. 9: Socio-demographic factors and the increase and decrease of breastfeeding[1]

	Decrease[/]			
Variable	UOR†	95%CI	AOR[a]	95%CI
Age				
20-24	0.7	0.38-1.27	1.45	0.64-3.30
25-30	0.84	0.50-1.40	1.71	0.85-3.43
30+	1		1	
Education				
High school	2.42	1.22-4.81	1.21	0.46-3.15
Inst. Of technology	0.99	0.59-1.65	1.08	0.54-2.14
≥University	1		1	
Live with husband's family				
Yes	1		1	
No	0.05	0.02-0.09	0.04	0.02-0.09
Breastfed older child				
Nulliparous [4]	1		1	
Yes	1.14	0.58-2.25	2.23	0.92-5.39
No	1.09	0.65-1.84	0.73	0.35-1.49
	Unchanged[/]			
Variable	UOR‡	95%CI	AOR[a]	95%CI
Age				
20-24	1.34	0.79-2.27	1.21	0.68-2.25
25-30	0.92	0.60-1.42	0.60	0.38-0.97
30+	1		1	
Education				
High school	3.02	1.84-4.98	4.36	2.38-7.99
Inst. Of technology	1.95	1.28-2.97	2.30	1.43-3.72
≥ University	1		1	
Live with husband's family				
Yes	1		1	
No	0.85	0.59-1.23	1.57	1.01-2.44
Breastfed older child				
Nulliparous ‡	1		1	
Yes	0.52	0.27-0.99	0.96	0.46-1.99
No	1.32	0.87-1.98	1.73	1.09-2.71
	Increase[/]			
Variable	UOR	95%CI	AOR[a]	95%CI
Age				
20-24	3.47	0.69-17.6	2.69	0.51-14.8
25-30	12.88	3.06-52.1	18.2	4.12-80.5
30+	1		1	
Education				
High school	0.17	0.06-0.51	0.19	0.06-0.66
Inst. of technology	0.69	0.37-1.28	0.63	0.30-1.34
≥ University	1		1	
Live with husband's family				
Yes	1		1	
No	10.37	4.33-24.8	6.06	2.31-15.9
Breastfed older child				
Nulliparous [4]	1		1	
Yes	1.16	0.38-3.53	0.44	0.11-1.71
No	0.74	0.39-1.43	0.58	0.26-1.32

UOR†: Unadjusted Odds Ratio.

:Increase in breastfeeding was defined as from discharge to 3 months, women shifted from formula feeding to either mixed feeding or exclusive breastfeeding, and from mixed feeding to exclusive breastfeeding. Those who were exclusive breastfeeding were excluded from the denominator. Decrease of breastfeeding was defined from discharge to 3 months, women shifted from exclusive breastfeeding to either mixed feeding or formula feeding, and from mixed feeding to formula feeding. Formula feeding at discharge was excluded from the denominator. Unchanged means the feeding method remained the same between discharge and 3 months.

--: Equal or more than one zeros in the logistic regression model and failure to predict. Or the variable does not fit into the regression model.

a: *adjusted for age, education, live with parents-in-law and feeding history(Level 1)*
A : Nulliparous are shown here due to the lack of baseline among multiparous women.

In table 9.9, adjustment did not alter the age effect, with the middle age group consistently more likely to increase after adjustment. The least educated women remained significantly less likely to increase in breastfeeding before and after adjustment. The more the women were educated, the less likely they would change in feeding behaviour after adjustments. Those who lived without in-laws were consistently more likely to increase and less likely to decrease in breastfeeding before and after adjustment. All these effects can be seen in table 10.7, though less directly.

After adjusting for confounders (see footnote table 9.9), there is an apparent effect reversal of living with in-laws and no change (from UOR: 0.85; CI: 0.59-1.23 to AOR: 1.57, 95%CI: 1.01-2.44). However, only the adjusted OR is statistically significant, and only just significant. After adjusting for education, the AOR for not to change among those who did not live with in-laws is 1.38 (CI: 0.90-2.11), and the effect reverse can be the combined effect of all the confounders but with education being the major force. The strong effect of being least educated on decrease is removed after adjustment.

Perceived influence of the attitudes of significant others

Table 9.10: The relationship between the perceived influence of the attitudes of significant others and infant feeding.

Variable	No	At discharge (%)				At 3 month (%)			
		FF*	Mixed*	EBF*	P	FF*	Mixed*	EBF*	P
Mother-in-law					<0.001				<0.001
Important	204	67.6	32.4	0		89.2	10.8	0	
Not so important	162	18.5	74.1	7.4		49.4	47.5	31	
No effect	138	13.0	69.6	17.4		8.7	63.8	27.5	
Husband					<0.001				<0.001
Important	187	10.2	73.8	16.0		4.3	73.3	22.5	
Not so important	157	38.9	61.1	0		68.2	31.8	0	
No effect	160	66.3	30.0	3.8		99.4	0	0.6	
Health professionals					<0.001				0.003
Important	66	54.5	45.5	0		72.7	27.3	0	
Not so important	270	26.7	64.4	8.9		49.6	38.9	11.5	
No effect	168	46.4	46.4	7.1		54.8	38.1	7.1	

**FF: formula feeding. Mixed: mixed feeding. EBF: exclusive breastfeeding.*

As the perceived importance of mother-in-law increases, there is more formula feeding and less breastfeeding. This effect may have been stronger at 3m than discharge. Women who perceived the husband's attitude was important had more exclusive breastfeeding both at discharge and 3 months. As the importance of husband decreases, there is an increase in formula feeding. None of those who said health professional's attitude was important were exclusive breastfeeding at discharge or 3 months. For those who said health professional's attitude was somewhat important there was less formula feeding and more breastfeeding both at discharge and at 3 months.

Table 9.11: Relationships between the perceived influence of the attitudes of significant others and change of breastfeeding behaviour

Factor	Less BF[1]			Not changing[1]			More BF[1]		
	No at risk	% decrease	p	No at risk	% unchanged	p	No at risk	% increase	p
Mother-in-law			<0.001			0.612			<0.001
Important	66	84.9		204	66.7		204	5.9	
Not so important	132	43.2		162	61.7		150	3.3	
No effect	120	13.3		138	63.8		114	29.8	
Husband			<0.001			0.054			<0.001
Important	127	11.3		168	68.4		157	25.5	
Not so important	157	59.4		96	56.7		157	7.0	
No effect	160	98.2		240	66.9		154	0	
Health professional			0.074			0.839			0.168
Important	30	60.0		66	63.6		66	9.09	
Not so important	198	38.9		270	63.3		246	8.94	
No effect	90	37.8		168	66.1		156	14.74	

[1]:*More breastfeeding was defined as from discharge to 3 months, women shifted from formula feeding to either mixed feeding or exclusive breastfeeding, and from mixed feeding to exclusive breastfeeding. Those who were exclusive breastfeeding were excluded from the denominator. Less breastfeeding was defined from discharge to 3 months, women shifted from exclusive breastfeeding to either mixed feeding or formula feeding, and from mixed feeding to formula feeding. Formula feeding at discharge was excluded from the denominator. Not changing means the feeding method remained the same between discharge and 3 months.*

Those who perceived mother-in-law's attitude was important were much more likely to decrease in breastfeeding; while those who said no effect were significantly more likely to increase. Women who stated their husband's attitude had no effect on them were significantly more likely to decrease, and less likely to increase to breastfeed.

Table 9.12: Odds ratios for the perceived influence of the attitudes of significant others and any breastfeeding[1] at discharge and 3 months.

Discharge						
Variable	UOR[†]	95%CI	AOR[a]	95%CI	AOR[b]	95%CI
Mother-in-law						
Important	0.07	0.04-0.13	0.13	0.06-0.28	0.23	0.09-0.57
Not so important	0.66	0.35-1.24	0.86	0.40-1.86	1.43	0.61-3.33
No effect	1		1		1	
Husband						
Important	17.4	9.75-30.9	5.87	2.60-13.2	4.31	1.62-11.5
Not so important	3.01	1.95-4.89	2.25	1.10-4.58	1.78	0.80-3.98
No effect	1		1		1	
Health professional						
Important	0.72	0.41-1.28	1.33	0.60-2.95	1.41	0.58-3.44
Not so important	2.38	1.59-3.58	2.31	1.29-4.14	1.56	0.81-3.0
No effect	1		1		1	
3 months						
Variable	UOR[†]	95%CI	AOR[a]	95%CI	AOR[b]	95%CI
Mother-in-law						
Important	0.01	0.005-0.02	0.01	0.004-0.04	‖	‖
Not so important	0.10	0.05-0.19	0.08	0.03-0.19	0.001	0.0002-0.07
No effect	1		1		1	
Husband						
Important	3557	440-28757	1691	180-15874	‖	‖
Not so important	74.3	10.1-546	27.5	3.41-222	59.0	2.89-1207
No effect	1		1		1	
Health professional						
Important	0.45	0.24-0.84	0. 86	0.33-2.23	‖	‖
Not so important	1.23	0.83-1.81	1.05	0.56-1.99	0.02	0.002-0.15
No effect	1		1		1	

UOR[†]: Unadjusted odds ratio.
a: adjusted for age, education, live with parents-in-law and feeding history (Level 1).
b: adjusted for age, education, live with parents-in-law and feeding history and other factors in this table (Level 2).
‖: Adjustment unstable due to low numbers.

After adjusting for level 1, the importance of mother-in-law's attitude was still strongly associated with less breastfeeding both at discharge and 3 months. It is hypothesized that there is an interaction between living with in-laws and reported importance of mother-in-law's attitude, which will be discussed later.

After adjusting for level 1, at both at discharge and 3 months, the importance of husband's attitude decreases, since the odds of breastfeeding decreases. Women with better education or women who did not live with in-laws were more likely to report husband as "important" (both $p<0.001$, results not shown).

Overall, the influence of both mother-in-law and husband's attitudes became stronger at 3 months.

Table 9.13: Significant other's attitudes and the increase and decrease of breastfeeding[1]

Decrease[1]						
Variable	UOR[†]	95%CI	AOR[a]	95%CI	AOR[b]	95%CI
Mother-in-law						
Important	36.4	15.5-85.5	18.8	6.99-50.6	10.0	2.81-36.4
Not so important	4.94	2.63-9.27	2.90	1.43-5.88	1.30	0.45-3.73
No effect	1		1		1	
Husband						
Important	0.09	0.05-0.16	0.01	0.005-0.20	0.04	0.01-0.14
Not so important	1		1		1	
No effect	36.3	4.81-273.3	22.0	2.58-165	33.2	3.58-307
Health professional						
Important	2.47	1.06-5.76	1.02	0.32-3.26	6.86	0.91-52.0
Not so important	1.05	0.63-1.75	1.38	0.70-2.71	‖	‖
No effect	1		1		1	
Unchanged[1]						
	UOR[†]	95%CI	AOR[a]	95%CI	AOR[b]	95%CI
Mother-in-law						
Important	1.14	0.72-1.79	0.83	0.46-1.49	1.17	0.70-2.25
Not so important	0.92	0.57-1.47	0.77	0.45-1.28	1.01	0.57-1.77
No effect	1		1		1	
Husband						
Important	1.66	1.07-2.58	1.95	1.17-3.23	2.13	1.22-3.72
Not so important	1		1		1	
No effect	1.54	0.98-2.43	0.87	0.49-1.57	0.83	0.46-1.53
Health professional						
Important	0.90	0.50-1.63	1.03	0.53-1.99	1.00	0.50-2.00
Not so important	0.89	0.59-1.33	0.93	0.60-1.47	0.79	0.50-1.26
No effect	1		1		1	
Increase[1]						
	UOR[†]	95%CI	AOR[a]	95%CI	AOR[b]	95%CI
Mother-in-law						
Important	0.15	0.07-0.30	0.40	0.17-0.98	0.71	0.25-2.01
Not so important	0.08	0.03-0.21	0.14	0.05-0.40	0.16	0.05-0.50
No effect	1		1		1	
Husband						
Important	4.54	2.23-9.23	4.51	1.96-10.4	4.50	1.58-12.85
Not so important	1		1		1	
No effect	--		--		--	
Health professional						
Important	0.58	0.22-1.49	0.69	0.21-2.19	0.78	0.23-2.63
Not so important	0.57	0.30-1.06	0.69	0.32-1.51	0.32	0.12-0.84
No effect	1		1		1	

[1]*:Increase in breastfeeding was defined as from discharge to 3 months, women shifted from formula feeding to either mixed feeding or exclusive breastfeeding, and from mixed feeding to exclusive breastfeeding. Those who were exclusive breastfeeding were excluded from the denominator. Decrease of breastfeeding was defined from discharge to 3 months, women shifted from exclusive breastfeeding to either mixed feeding or formula feeding, and from mixed feeding to formula feeding. Formula feeding at discharge was excluded from the denominator. Unchanged means the feeding method remained the same between discharge and 3 months.*

UOR[†]: Unadjusted Odds Ratio.

a: adjusted for age, education, live with parents-in-law and feeding history (Level 1).

b: adjusted for age, education, live with parents-in-law and feeding history and other factors in this table (Level 2).

--: ≥ one zeros in the logistic regression model and failure to predict. Or the variable does not fit into the regression model. ‖: Adjustment unstable due to low numbers.

After adjusting for level 1, there is an inverse relationship between the importance of mother-in-law's attitude and the increase in breastfeeding; and a positive relationship with the decrease in breastfeeding. After adjusting for level 2, the effects of mother-in-law's attitude as not so important on the decrease, and important on increase of breastfeeding are removed

(95% confidence interval cross 1), though the trends remained.

After adjustment for confounders at level 1, the positive effect of mother-in-law's attitude on decrease in breastfeeding and the negative effect on increase in breastfeeding remained, through were weaker (OR close to 1) than the unadjusted effects. After adjustment at level 2, both effects were still statistically significant (for decrease, only for the important level of mother-in-law's attitude and for increase only for the intermediate level)), though weaker still. One concludes that this attitude remains of some importance throughout.

Also, after adjusting for level 1 &2, the importance of husband's attitude is still related to increase in breastfeeding and adjustment made little difference to the strength of the association (the OR), although numbers did not permit estimation for "no importance". After adjusting for the first level, there is a trend that as the importance of husband decreases, the chance of decrease in breastfeeding increases. This trend remains, and is of similar magnitude, after adjusting for the second level which includes importance of mother-in-law. This in turn suggests that the effect of the husband's attitude is largely independent of that of the mother in law, which is contrary to suggestion in the qualitative results that some husbands give in to their mothers; it is possible that this does not occur to a large extent.

Source of information

Table 9.14: Source of information and the relationships between any breastfeeding.

Variable	No	At discharge (%)				At 3 month (%)			
		FF*	Mixed*	EBF*	P	FF*	Mixed*	EBF*	P
Mother-in-law					<0.001				<0.001
Major	288	52.1	47.9	0		62.8	34.0	3.1	
Minor	174	20.7	75.9	3.4		46.6	42.0	11.5	
No	42	0	28.6	71.4		28.6	38.1	33.3	
Health professional					<0.001				<0.001
Major	144	41.7	50.0	8.3		66.7	27.8	5.6	
Minor	240	22.5	70.0	7.5		41.3	46.7	12.1	
No	120	60.0	35.0	5.0		65.8	29.2	5.0	
Books					<0.001				<0.001
Major	192	18.8	65.6	15.6		42.2	44.8	13.0	
Minor	192	40.6	56.3	3.1		53.6	39.1	7.3	
No	120	60.0	40.0	0		75.0	21.7	3.3	
Internet					<0.001				<0.001
Major	198	9.1	72.7	18.2		31.8	51.0	17.2	
Minor	168	35.7	64.3	0		61.3	36.9	1.8	
No	138	78.3	21.7	0		78.3	17.4	4.3	

**FF: formula feeding. Mixed: mixed feeding. EBF: exclusive breastfeeding.*

Information from mother-in-law tended to be positively related to formula feeding and negatively related to exclusive breastfeeding both at discharge and 3 months.

Those who perceived health professionals as a minor source of information tended to formula feed least and breastfeed (mixed feeding and exclusive breastfeeding) most both at discharge and 3 months. Furthermore, information from books and Internet tended to be negatively related to formula feeding and positively related to exclusive breastfeeding both at discharge and 3 months.

Table 9.15: Relationships between the source of information and change of breastfeeding behaviour.

Factor	Less BF[1]			Not changing[1]			More BF[1]		
	No at risk	% decrease	p	No at risk	% unchanged	p	No at risk	% increase	p
Mother-in-law			0.082			<0.001			0.216
Major	138	64.5		288	73.6		288	9.4	
Minor	138	58.7		174	53.4		168	14.3	
No	42	45.2		42	45.2		12	0	
Health professional			0.008			0.228			0.352
Major	84	45.0		144	61.8		132	7.6	
Minor	186	63.2		240	62.5		222	12.2	
No	48	21.9		120	70.8		114	12.3	
Books			0.144			0.002			0.466
Major	156	42.3		192	54.7		162	13.0	
Minor	114	34.2		192	69.3		186	10.8	
No	48	50.0		120	71.7		120	8.3	
Internet			0.445			<0.001			0.007
Major	180	37.8		198	52.5		162	16.1	
Minor	108	45.4		160	65.5		168	5.4	
No	30	40		138	79.7		138	11.6	

[1] *:More breastfeeding was defined as from discharge to 3 months, women shifted from formula feeding to either mixed feeding or exclusive breastfeeding, and from mixed feeding to exclusive breastfeeding. Those who were exclusive breastfeeding were excluded from the denominator. Less breastfeeding was defined from discharge to 3 months; women shifted from exclusive breastfeeding to either mixed feeding or formula feeding, and from mixed feeding to formula feeding. Formula feeding at discharge was excluded from the denominator. Not changing means the feeding method remained the same between discharge and 3 months.*

The effect of mother-in-law's advice does not appear to be related signifcantly to an overall increase or decrease in breastfeeding. But as the influence of mother-in-law increases, women have a higher chance to remain unchanged ($p<0.001$). This is an apparently contradictory set of results where from the fact that there were a larger number of women with mother-in-law influential, who were formula feeding at discharge. These were not at risk of decrease and relatively few showed any increase and the percentage unchanged in this group was considerable. It must also be born in mind that the lack of statistical significance for decrease and increase does not imply no effect at all.Those who rated the effect of health professionals as minor showed significantly more decrease in breastfeeding, and using the Internet as major source of information was related to more increase in breastfeeding.

Table 9.16: Odds ratios for the source of information and the any breastfeeding[1] at discharge and 3months

Discharge								
Variable	UOR†	95%CI	AOR[a]	95%CI	AOR[b]	95%CI	AOR[c]	95%CI
Mother-in-law								
Major	1		1		1		1	
Minor	4.17	2.7-6.43	3.65	2.07-6.43	3.49	2.19-35.5	3.80	1.46-9.92
No	--	--	--	--	--	--	--	--
Health professional								
Major	2.1	1.28-3.44	3.04	1.45-6.38	8.28	1.93-35.5	1.97	0.23-16.8
Minor	5.17	3.21-8.30	3.47	1.80-6.69	4.30	1.25-14.9	1.84	0.40-8.55
No	1		1		1		1	
Books								
Major	6.5	3.89-10.9	0.57	0.19-1.71	0.43	0.11-0.71	1.67	0.35-7.87
Minor	2.19	1.38-3.49	1.51	0.79-2.88	2.26	1.00-5.09	2.26	0.66-7.72
No	1		1		1		1	
Internet								
Major	36	19.15-67.7	5.01	1.67-15.0	21.8	5.13-92.2	32.0	6.62-155
Minor	6.48	3.88-10.8	10.8	5.34-21.8	31.0	11.5-83.8	31.9	11.1-91.5
No	1		1		1		1	
3 months								
Variable	UOR†	95%CI	AOR[a]	95%CI	AOR[b]	95%CI	AOR[c]	95%CI
Mother-in-law								
Major	1		1					
Minor	1.92	1.33-2.85	1.12	0.59-2.10	‖	‖	‖	‖
No	4.23	2.08-8.61	0.28	0.10-0.75				
Health professional								
Major	0.96	0.58-1.61	0.39	0.16-0.94	0.06	0.001-2.28	0.09	0.009-9.62
Minor	2.74	1.74-4.33	1.65	0.78-3.50	0.95	0.04-22.1	0.58	0.02-19.3
No	1		1		1		1	
Books								
Major	4.11	2.49-6.80	0.39	0.09-1.59	0.07	0.0001-118	0.06	0.0001-73.5
Minor	2.59	1.57-4.28	1.43	0.61-3.38	5.41	0.39-74.5	58.7	0.45-7726
No	1		1		1		1	
Internet								
Major	7.71	4.66-12.8	0.35	0.09-1.27	15.9	0.14-1846	‖	‖
Minor	2.27	1.36-3.78	1.21	0.54-2.73	2.91	0.10-86.7		
No	1		1		1		1	

UOR†: Unadjusted Odds Ratio.
a: adjusted for age, education, live with parents-in-law and feeding history (Level 1).
b: adjusted for age, education, live with parents-in-law, feeding history and attitudes (Level 2).
c: adjusted for age, education, live with parents-in-law, feeding history and attitudes and other factors in this table (Level 3).
--: ≥ *one zeros in the logistic regression model and failure to predict.*
‖: *Adjustment unstable due to small numbers. UOR†: Unadjusted Odds Ratio.*

There is a negative relationship between the importance of the information from mother-in-law and breastfeeding at discharge which shows little change with adjustment. However, at 3 months, after adjusting for the first level, the effect of no influence of mother-in-law, compared with major influence, on breastfeeding reversed from significantly more likely (UOR: 4.23, 95%CI: 2.08-8.61) to significantly less likely(AOR:0.28, 95%CI: 0.10-0.75) to breastfeed. The effect reversal is mainly caused by controlling for living with in-laws.

After adjusting for the first level, those who reported health professional as major source of information tended to breastfeed more at discharge in comparison of those received no information from health professionals. This relationship remains true but less after allowing levels 2 variables, but not significant with level 3. Nearly 70% of the most educated group reported health professionals were a minor source of information, and 91% of this best educated group was breastfeeding at discharge and 68.2% at 3 months.

Table 9.17: Odds ratios for the source of information and the increase and decrease of breastfeeding[1]

Decrease[1]								
Variable	UOR[†]	95%CI	AOR[a]	95%CI	AOR[b]	95%CI	AOR[c]	95%CI
Mother-in-law								
Major	1		1		1		1	
Minor	0.85	0.48-1.33	0.83	0.41-1.69	1.28	0.59-2.78	0.21	0.04-1.01
No	0.45	0.23-0.92	0.01	0.04-0.27	0.12	0.04-0.34	0.02	0.03-0.10
Health professional								
Major	1.48	0.73-3.02	‖	‖	‖	‖	‖	‖
Minor	0.65	0.35-1.25	0.88	0.36-2.15	1.77	0.39-3.65	0.48	0.04-5.31
No	1		1		1		1	
Books								
Major	0.73	0.38-1.40	1.29	0.33-4.96	3.84	0.72-20.6	0.68	0.05-9.40
Minor	0.52	0.26-1.03	0.66	0.25-1.72	1.21	0.37-4.03	0.24	0.04-1.31
No	1		1		1		1	
Internet								
Major	0.91	0.41-2.00	13.6	1.93-96.5	28.0	2.91-26.9	‖	‖
Minor	1.25	0.55-2.83	3.46	0.68-17.6	1.85	0.31-11.1	131	3.97-4358
No	1		1		1		1	
Unchanged[1]								
Variable	UOR[†]	95%CI	AOR[a]	95%CI	AOR[b]	95%CI	AOR[c]	95%CI
Mother-in-law								
Major	1		1		1		1	
Minor	0.41	0.28-0.61	0.42	0.27-0.65	0.42	0.27-0.66	0.35	0.22-0.57
No	0.30	0.15-0.57	0.41	0.19-0.89	0.42	0.19-0.91	0.35	0.16-0.79
Health professional								
Major	0.67	0.40-1.12	0.64	0.36-1.14	0.71	0.38-1.32	0.46	0.19-1.15
Minor	0.69	0.43-1.10	0.92	0.55-1.55	1.00	0.58-1.73	0.68	0.30-1.58
No	1		1		1		1	
Books								
Major	0.48	0.29-0.78	1.75	0.74-4.15	1.67	0.67-4.17	1.54	0.63-3.73
Minor	0.89	0.54-1.47	1.59	0.82-3.07	1.51	0.75-3.07	1.54	0.76-3.80
No	1		1		1		1	
Internet								
Major	0.28	0.17-0.46	0.28	0.11-0.70	0.34	0.13-0.89	0.36	0.14-0.91
Minor	0.48	0.29-0.81	0.52	0.30-0.92	0.55	0.30-1.00	0.50	0.27-0.93
No	1		1		1		1	
Increase[1]								
Variable	UOR[†]	95%CI	AOR[a]	95%CI	AOR[b]	95%CI	AOR[c]	95%CI
Mother-in-law								
Major	1		1		1		1	
Minor	1.61	0.89-2.89	1.10	0.54-2.29	0.33	0.10-1.14	3.01	0.98-9.19
No	--	--	--	--	--	--	--	--
Health professional								
Major	0.59	0.25-1.37	0.22	0.07-0.67	0.33	0.10-1.14	0.05	0.01-0.39
Minor	0.99	0.49-1.96	0.40	0.16-0.99	0.48	0.16-1.41	0.08	0.02-0.40
No	1		1		1		1	
Books								
Major	1.64	0.74-3.62	0.02	0.002-0.21	0.07	0.01-0.66	0.005	0.001-0.1
Minor	1.32	0.60-2.94	0.50	0.16-0.99	0.76	0.20-2.94	0.07	0.01-0.43
No	1		1		1		1	
Internet								
Major	1.46	0.75-2.84	0.13	0.01-1.25	0.09	0.01-1.28	1.17	0.04-32.4
Minor	0.43	0.18-1.00	0.16	0.04-0.36	0.11	0.03-0.36	0.18	0.05-0.66
No	1		1		1		1	

UOR[†]: Unadjusted Odds Ratio. ‖: Adjustment unstable due to small numbers.
a: adjusted for age, education, live with parents in law, and feeding history (Level 1).
b: adjusted for age, education, live with parents in law, feeding history and other factors in this table (Level 2).
c: adjusted for age, education, live with parents in law, feeding history, attitudes of mother-in-law, husband, health professionals and other factors in this table (Level 3).
[1]:Increase in breastfeeding was defined as from discharge to 3 months, women shifted from formula feeding to either mixed feeding or exclusive breastfeeding, and from mixed feeding to exclusive breastfeeding. Those who

were exclusive breastfeeding were excluded from the denominator. Decrease of breastfeeding was defined from discharge to 3 months, women shifted from exclusive breastfeeding to either mixed feeding or formula feeding, and from mixed feeding to formula feeding. Formula feeding at discharge was excluded from the denominator. Unchanged means the feeding method remained the same between discharge and 3 months.

--: ≥ zeros in the logistic regression model and failure to predict. Or the variable does not fit into the regression model.

A decrease in breastfeeding was more common among those who indicated no influence of the information from the mother-in-law; this effect became stronger with adjustment. None of those who lived with in-laws said they had no information from their mother-in-law. After adjusting for the 1st level, those reported mother-in-law was not a source of information were much more likely to decrease in breastfeeding.

The relationships between the decrease in breastfeeding and information from health professionals are strongly affected by the small numbers and collinearity when adding education and live with in-laws in the regression model.

The prepartum factors

All women covered under National Health Insurance are entitled to 10 antenatal visits while the government says 15 visits would be ideal, and the majority (91.2%) attend 7-10 visits [311]. Nearly all hospitals with birthing units run their own antenatal education sessions that are independent from the antenatal check-ups. Health professionals working in the maternity ward have no specific training on how to teach parents, but are responsible for teaching. Since this is unpaid extra work, people generally take turns. The sessions are usually held during evenings or weekends since the majority of women are working, and this also enables fathers to participate. There is no "birth educator" and the concept of "paying" for antenatal session does not exist. These sessions are generally held in a lecture theatre with tens, sometimes nearly a hundred parents and family members. The lectures are generally delivered by PowerPoint presentations with virtually no interaction.

It is not unusual to have commercial involvement in this activity since it is "common sense" that a company provides refreshments and gifts for both professionals as well as parents. As there is no such thing as a free lunch, company personnel generally use this opportunity to get parents' details including due dates and contact numbers in exchange for gifts. As already mentioned, commercial visits during hospitalisation were common and hospitals giving out commercial packs were nearly universal before the local breastfeeding promotion programme. After implementing this programme, those accredited as "baby friendly" are required to cut the entire commercial link. However, this is not so easy since a huge sum of money is involved. Many hospitals complain about the lack of funding from the company and they earn nothing in money terms in promoting breastfeeding. Some come up with very cunning ways of cooperating (see previous chapter for an example). In the recent 2 years, some companies run antenatal sessions in conference centres in five-star hotels and invite doctors from locally baby friendly hospital to give lectures, since the location is not in the hospital physically, the hospital itself is not liable and therefore fulfils the local assessment requirement.

Table 9.18: Prepartum variables and the relationships between types of infant feeding. (n=504)

Variable	No	At discharge (%)				At 3 month (%)			
		FF*	Mixed*	EBF*	P	FF*	Mixed*	EBF*	P
Attend antenatal education					0.18				0.415
Yes	198	39.4	51.5	9.1		54.5	38.9	6.6	
No	306	35.3	58.8	5.9		54.2	35.9	9.8	
First thought of infant feeding					<0.001				<0.001
Before pregnancy	288	10.4	77.1	12.5		36.1	51.0	12.8	
Early-mid pregnancy	114	57.9	42.1	0		64.9	29.8	5.3	
Late pregnancy and after birth	102	88.2	11.8	0		94.1	5.9	0	

**FF: formula feeding. Mixed: mixed feeding. EBF: exclusive breastfeeding.*

Attendance of antenatal education was not found to be related to breastfeeding at discharge and 3 months. However, early consideration of infant feeding was associated with less formula feeding and more breastfeeding both at discharge and 3 months.

Table 9.19: Relationships between prepartum factors and change of breastfeeding behaviour.

Factor	Less BF[1]			Not changing[1]			More BF[1]		
	No at risk	% decrease	p	No at risk	% unchanged	p	No at risk	% increase	p
Attend antennal classes			0.528			0.097			0.27
Yes	120	38.3		198	68.7		180	8.9	
No	198	41.9		306	61.4		288	12.2	
First think of infant feeding			<0.001			<0.001			0.173
Before pregnancy	258	38.0		288	55.6		252	11.9	
Early-mid pregnancy	48	39.6		114	70.2		114	13.2	
Late pregnancy and after birth	12	100		102	82.4		102	5.9	

[1]:More breastfeeding was defined as from discharge to 3 months, women shifted from formula feeding to either mixed feeding or exclusive breastfeeding, and from mixed feeding to exclusive breastfeeding. Those who were exclusive breastfeeding were excluded from the denominator. Less breastfeeding was defined from discharge to 3 months; women shifted from exclusive breastfeeding to either mixed feeding or formula feeding, and from mixed feeding to formula feeding. Formula feeding at discharge was excluded from the denominator. Not changing means the feeding method remained the same between discharge and 3 months.

These findings reveal that the attendance of antenatal education has no significant impact on the change of breastfeeding. Moreover, women considered feeding late were more likely either to decrease breastfeeding or not to change their feeding behaviour.

Table 9.20: Odds ratios for the prepartum factors and the any breastfeeding[1] at discharge and 3 months.

Discharge								
Variable	UOR[†]	95%CI	AOR[a]	95%CI	AOR[b]	95%CI	AOR[c]	95%CI
Attend antenatal education								
Yes	1		1		1		1	
No	1.19	0.82-1.72	1.64	0.96-2.81	1.05	0.48-2.30	0.94	0.40-2.20
First thought of infant feeding								
Before pregnancy	1		1		1		1	
Early-mid pregnancy	0.08	0.05-0.14	0.07	0.03-1.56	0.01	0.002-0.06	0.0002	0.002-0.06
Late pregnancy and after birth	0.02	0.01-0.04	0.03	0.001-0.07	‖	‖	‖	‖
3 months								
Variable	UOR[†]	95%CI	AOR[a]	95%CI	AOR[b]	95%CI	AOR[c]	95%CI
Attend antenatal education								
Yes	1		1		1		1	
No	1.01	0.71-1.45	0.68	0.28-1.093	0.002	0.28-1.093	0.03	0.00004-0.30
First thought of infant feeding								
Before pregnancy	1		1		1		1	
Early-mid pregnancy	0.31	0.19-0.48	0.93	0.37-2.30	0.08	0.003-1.87	‖	‖
Late pregnancy and after birth	0.47	0.02-0.71	0.18	0.05-0.59	‖	‖	‖	‖

UOR[†]: Unadjusted Odds Ratio.
a: adjusted for age, education, live with parents in law, and feeding history (Level 1).
b: adjusted for age, education, live with parents-in-law, feeding history, attitudes of mother-in-law, husband, information from mother-in-law and internet (level 2).
c: adjusted for age, education, live with parents-in-law, feeding history, attitudes of mother-in-law, husband, information from mother-in-law and internet, and information and attitudes of health professional (Level 3).
‖: Adjustment unstable due to small numbers.

After the first level of adjustment, later consideration of infant feeding remained strongly associated with less breastfeeding at discharge and 3 months, with an increase of the effect with adjustment at 3 months. Attendance of antenatal education was not shown to be associated with breastfeeding at discharge, while at 3 months it showed a strong effect after adjustment.

Table 9.21: Odds ratios for the prepartum factors and the increase and decrease of breastfeeding

Decrease[1]								
Variable	UOR[†]	95%CI	AOR[a]	95%CI	AOR[b]	95%CI	AOR[c]	95%CI
Attend antenatal education								
Yes	1		1		1		1	
No	1.16	0.73-1.84	1.46	0.77-2.79	‖	‖	‖	‖
First thought of infant feeding								
Before pregnancy	1		1		1		1	
Early-mid preg.	1.07	0.57-2.01	‖	‖	‖	‖	‖	‖
Late pregnancy and after birth	--	--	--	--	--	--	--	--
Unchanged[1]								
Variable	UOR[†]	95%CI	AOR[a]	95%CI	AOR[b]	95%CI	AOR[c]	95%CI
Attend antenatal education								
Yes	1		1		1		1	
No	0.73	0.50-1.06	0.57	0.37-0.87	0.47	0.29-0.75	0.46	0.01-0.75
First thought of infant feeding								
Before pregnancy	1							
Early-mid preg.	1.88	1.18-2.99	1.73	0.91-3.27	1.73	0.91-3.27	1.57	0.74-3.30
Late pregnancy and after birth	3.73	2.13-6.53	4.44	2.03-9.72	4.44	2.03-9.72	6.04	2.42-15.1
Increase[1]								
Variable	UOR[†]	95%CI	AOR[a]	95%CI	AOR[b]	95%CI	AOR[c]	95%CI
Attend antenatal education								
Yes	1		1		1		1	
No	1.42	0.76-2.64	0.84	0.40-1.78	0.46	0.18-1.16	0.06	0.01-0.42
First thought of infant feeding								
Before pregnancy	1		1		1		1	
Early-mid preg.	1.12	0.58-2.18	3.33	1.25-8.89	5.36	1.02-28.3	--	--
Late pregnancy and after birth	0.62	0.25-1.54	3.29	0.85-12.7	‖	‖	--	--

UOR[†]: Unadjusted Odds Ratio.
a: adjusted for age, education, live with parents-in-law and feeding history (Level 1).
b: adjusted for age, education, live with parents-in-law and feeding history attitudes of mother-in-law, husband, information from mother-in-law and internet (Level 2).
c: adjusted for age, education, live with parents-in-law and feeding history attitudes of mother-in-law, husband, information from mother-in-law and internet plus information and attitudes of health professionals (Level 3).
UOR[†]: Unadjusted Odds Ratio.

[1]:Increase in breastfeeding was defined as from discharge to 3 months, women shifted from formula feeding to either mixed feeding or exclusive breastfeeding, and from mixed feeding to exclusive breastfeeding. Those who were exclusive breastfeeding were excluded from the denominator. Decrease of breastfeeding was defined from discharge to 3 months, women shifted from exclusive breastfeeding to either mixed feeding or formula feeding, and from mixed feeding to formula feeding. Formula feeding at discharge was excluded from the denominator. Unchanged means the feeding method remained the same between discharge and 3 months.
‖: Adjustment unstable due to small numbers.
--: ≥ one zeros in the logistic regression model and failure to predict or does not fit into the model.

After adjustment, those who attended antenatal education remained more likely to keep the same feeding methods. However, there was also an association of attendance with increase in breastfeeding with adjustment, while the adusted effect on decrease could not be obtained. One can conclude tentatively that attendance tended to make the decision more firm for seom women, but some may possibly have tended to be persuaded into formula feeding but changed their behaviour later. Furthermore, those who considered infant feeding during late pregnancy or after birth were less flexible in changing feeding methods. They also were more likely to increase in breastfeeding after adjustment.

Intrapartum factors

Table 9.22 :Intrapartum variables and the relationships between types of infant feeding.

Variable	No	At discharge(%)				At 3 months (%)			
		FF*	Mixed*	EBF*	P	FF*	Mixed*	EBF*	P
Mode of delivery					<0.001				<0.001
CS[A]	174	72.4	24.1	3.5		76.4	21.3	2.3	
VB[A]	330	18.2	72.7	9.1		42.7	45.5	11.8	
Epidural [B]					0.001				<0.001
Yes	124	25.8	71.0	3.2		56.5	30.6	12.9	
No	206	13.6	73.8	12.6		34.5	54.4	11.2	

**FF: formula feeding. Mixed: mixed feeding. EBF: exclusive breastfeeding.*
[A] CS: Caesarean section; VB: vaginal birth [B]: For those had VB only.

Women who had vaginal birth had more of any breastfeeding both at discharge and 3 months. Women who had no epidural had more exclusive and less formula feeding at discharge. After 3 months, they still had less formula feeding but the effects on more exclusive breastfeeding had disappeared.

Table 9.23: Relationships between mode of delivery and change of breastfeeding behaviour.

Factor	Less BF[1]			Not changing[1]			More BF[1]		
	No at risk	% decrease	p	No at risk	% unchanged	p	No at risk	% increase	p
Mode of delivery			0.037			<0.001			0.686
CS [A]	48	54.2		174	75.3		168	10.1	
VB [A]	270	38.2		330	58.5		300	11.3	

[A] CS: Caesarean section; VB: vaginal birth [B]: For those had VB only.
. ‡: For those had VB only.[1]:More breastfeeding was defined as from discharge to 3 months, women shifted from formula feeding to either mixed feeding or exclusive breastfeeding, and from mixed feeding to exclusive breastfeeding. Those who were exclusive breastfeeding were excluded from the denominator. Less breastfeeding was defined from discharge to 3 months; women shifted from exclusive breastfeeding to either mixed feeding or formula feeding, and from mixed feeding to formula feeding. Formula feeding at discharge was excluded from the denominator. Not changing means the feeding method remained the same between discharge and 3 months.

Overall, those who had VB and those who had CS were less likely to change feeding methods. And having CS was statistically associated with more decrease in breastfeeding, and whether this is a causal relationship is subject to debate.

Table 9.24: Odds ratios for the intrapartum factors and the type of breastfeeding[1] at discharge and 3 months.

Discharge										
Variable	UOR†	95%CI	AOR[a]	95%CI	AOR[b]	95%CI	AOR[c]	95%CI	AOR[d]	95%CI
Mode of delivery										
CS [A]	0.08	0.05-0.13	0.08	0.04-0.15	0.05	0.02-0.11	0.008	0.001-0.05	0.007	0.0009-0.05
VB [A]	1		1		1		1		1	
Epidural [B]										
Yes	0.45	0.26-0.80	0.61	0.30-1.23	0.61	0.28-1.32	0.10	0.03-3.10	‖	‖
No	1		1		1		1		1	
3 months										
Variable	UOR†	95%CI	AOR[a]	95%CI	AOR[b]	95%CI	AOR[c]	95%CI	AOR[d]	95%CI
Mode of delivery										
CS [A]	0.23	0.02-0.35	0.80	0.41-1.58	0.72	0.13-3.85	0.16	0.001-18.5	1.29	0.02-85.2
VB [A]	1		1		1		1		1	
Epidural [B]										
Yes	0.41	0.26-0.64	0.50	0.26-0.97	0.99	0.17-5.81	1.38	0.20-9.52	‖	‖
No	1		1		1		1		1	

UOR†: Unadjusted Odds Ratio
a: adjusted for age, education, live with parents-in-law and feeding history (Level 1).
b: adjusted for age, education, live with parents-in-law, feeding history and attitudes (Level 2).
c: adjusted for age, education, live with parents-in-law, feeding history, attitudes and info mom, health professional and internet (Level 3).
d: adjusted for age, education, live with parents-in-law, feeding history attitudes ,info mom, health professional and internet and attendance of antenatal education.
‖: Adjustment unstable due to small numbers.
[A] CS: Caesarean section; VB: vaginal birth. [B]: For those had VB only.

After adjustment (see footnotes), having CS remained consistently related to less breastfeeding at discharge; but the effects had become insignificant after 3 months from the first level of adjustment. In general, intrapartum epidural had no significant effects on breastfeeding both at discharge and 3 months, after adjustment.

Table 9.25: Odds ratios for the intrapartum factors and the increase and decrease of breastfeeding[1]

Decrease [1]										
Variable	UOR[†]	95%CI	AOR[a]	95%CI	AOR[b]	95%CI	AOR[c]	95%CI	AOR[d]	95%CI
Mode of delivery										
CS [A]	1.92	1.03-3.56	1.30	0.53-3.17	1.18	0.29-4.83	0.63	0.05-7.65	0.21	0.01-4.22
VB [A]	1		1		1		1		1	
Epidural [B]										
Yes	2.12	1.27-3.56	1.55	0.81-2.96	0.92	0.35-2.43	1.54	0.41-5.74	‖	‖
No	1		1		1		1		1	
Unchanged [1]										
Variable	UOR[†]	95%CI	AOR[a]	95%CI	AOR[b]	95%CI	AOR[c]	95%CI	AOR[d]	95%CI
Mode of delivery										
CS [A]	2.16	1.44-3.25	1.95	0.98-2.47	2.04	1.26-3.31	1.76	1.04-2.99	1.78	1.04-3.02
VB [A]	1		1		1		1		1	
Epidural [B]										
Yes	0.44	0.28-0.69	0.36	0.22-0.59	0.38	0.25-0.62	0.31	0.18-0.52	‖	‖
No	1		1		1		1		1	
Increase [1]										
Variable	UOR[†]	95%CI	AOR[a]	95%CI	AOR[b]	95%CI	AOR[c]	95%CI	AOR[d]	95%CI
Mode of delivery										
CS [A]	0.88	0.48-1.63	15.4	4.63-51.1	164	19.7-1374	‖	‖	‖	‖
VB [A]	1		1		1		1		1	
Epidural [B]										
Yes	2.72	1.31-5.68	4.27	1.6-10.4	19.7	4.62-84.3	8.41	1.66-42.7	‖	‖
No	1		1		1		1		1	

UOR[†]: Unadjusted Odds Ratio
a: adjusted for age, education, live with parents in law and feeding history (Level 1).
b: adjusted for age, education, live with parents in law feeding history and attitudes of mother-in-law, husband and health professionals (Level 2).
c: adjusted for age, education, live with parents in law and feeding history, attitudes of mother-in-law, husband and health professionals and info from mother-in-law, health professionals and internet (Level 3).
d: adjusted for age, education, live with parents in law and feeding history attitudes of mother-in-law, husband and health professionals and info from mother-in-law, health professionals and internet and attendance of antenatal education (Level 4).
[1]:Increase in breastfeeding was defined as from discharge to 3 months, women shifted from formula feeding to either mixed feeding or exclusive breastfeeding, and from mixed feeding to exclusive breastfeeding. Those who were exclusive breastfeeding were excluded from the denominator. Decrease of breastfeeding was defined from discharge to 3 months; women shifted from exclusive breastfeeding to either mixed feeding or formula feeding, and from mixed feeding to formula feeding. Formula feeding at discharge was excluded from the denominator.
‖: Adjustment unstable due to small numbers
[A] CS: Caesarean section; VB: vaginal birth. [B]: For those had VB only.

After level 1 & 2 adjustments, those who had CS and those who had intrapartum epidural were more likely to increase in breastfeeding. A reverse confounding was noted that after level 1 adjustment, women who had CS had significantly higher odds to increase in breastfeeding (AOR: 15.4, CI: 4.63-51.1), and this remains true after level 2 adjustment. After inspection of tables and stratifying by the confounders showed that living with in-laws was the factor causing this effect reversal. This is explored in more detail in Table 9.26

Table 9.26: Percentage of increase in breastfeeding broken down by mode of delivery and family type.

% Increase in breastfeeding (No)	Live with in-laws	
Mode of delivery	Yes	No
CS	4.5% (134)	32.4%(34)
VB	0% (114)	18.3% (186)

Women who lived with in-laws were more likely to have CS ($p<0.001$) and mother-in-law played a part in the choice of elective CS (see later). Moreover, those who lived with in-laws and had VB, none of them increase in breastfeeding. This imbalance drives the reverse confounding effect.

"Social" CS and breastfeeding

In societies where CS rates are high, many CS are performed under "social" rather than medical indications. There were 150 women who had elective CS in this current study, and this subsection investigates the reasons for elective CS and the effect on breastfeeding. They were asked the reasons for opting for CS, and were given a list of choices. Among 150 women with elective CS, 102 gave "family" among the reasons; these were then given choice as to family members they thought influential.

Due to relatively small numbers in this section, regression is not extensively applied due to high failure rates in fitting the models.

Table 9.27: Reasons for elective CS and feeding behaviours.

Variable	No	At discharge(%)				At 3 months (%)			
		FF*	Mixed*	EBF*	P	FF*	Mixed*	EBF*	P
Family [A]					<0.001				0.002
Yes	102	82.4	17.6	0		82.4	17.6	0	
No	48	37.5	50.0	12.5		62.5	29.2	8.3	
Husband [B]					<0.001				<0.001
Yes	42	100.0	0	0		100.0	0	0	
No	60	70.0	30.0	0		70.0	30.0	0	
Mother-in-law [B]					0.687				0.003
Yes	72	83.3	16.7	0		75.0	25.0	0	
No	30	80.0	20.0	0		100.0	0	0	

**FF: formula feeding. Mixed: mixed feeding. EBF: exclusive breastfeeding.*
[A]: include all cases who had elective CS (n=150).
[B]: including only those who stated that family was one of the reasons for elective CS (n=102).

Among those who had elective CS, none of those who said their family wanted them to have CS exclusively breastfed both at discharge and 3 months. This group also had more formula feeding both at discharge and 3 months. Moreover, mother-in-law was the most commonly cited family member of wanting elective CS (70.6%), followed by husband (41.2%).

All those said their husband wanted them to have CS were formula feeding both at discharge and 3 months. None of those who said their mother-in-law wanted them to have CS exclusively breastfed both at discharge and 3 months, but the effect of mother-in-laws

influence in feeding pattern was not significant. .

Table 9.28: Reasons of elective CS and the change of breastfeeding behaviour.

Factor	Less BF[1]			Not changing[1]			More BF[1]		
	No at risk	% decrease	P[C]	No at risk	% unchanged	P[C]	No at risk	% increase	P[C]
Family[A]			0.18			0.46			0.02
Yes	18	66.7		102	76.5		102	11.8	
No	30	46.7		48	70.1		42	0	
Husband[B]			--			<0.001			0.001
Yes	0	0		40	100.0		42	0	
No	18	66.7		62	60.0		60	20.0	
Mother-in-law[B]			0.02			0.59			0.002
Yes	12	50.0		69	75.0		72	16.7	
No	6	100.0		33	80.0		30	0	

[1]:More breastfeeding was defined as from discharge to 3 months, women shifted from formula feeding to either mixed feeding or exclusive breastfeeding, and from mixed feeding to exclusive breastfeeding. Those who were exclusive breastfeeding were excluded from the denominator. Less breastfeeding was defined from discharge to 3 months; women shifted from exclusive breastfeeding to either mixed feeding or formula feeding, and from mixed feeding to formula feeding. Formula feeding at discharge was excluded from the denominator. Not changing means the feeding method remained the same between discharge and 3 months.

[A]: include all cases had elective CS (n=150).

[B]: including only those stated that family was one of the reasons for elective CS (n=102).

[C]: Fisher's chi test is used when appropriate.

All of those who said their husband wanted them to have CS were formula feeding at discharge, and there is no eligible case to decrease breastfeeding. And all of them remained formula feeding at 3 months. The was more increase in breastfeeding among those whose families influenced them to have a CS, but among those influenced by the family, when the husband was influential for CS there was no increase, and then the mother-in-law was influential there was more increase. It would appear than once the mother-in-law's direct influence become less, by 3 months, then these women tended to increase their breastfeeding.

Postpartum factors

Having skin contact immediately after birth and room-in are the major exposures of interest. However, 94.6% of women reported their baby was with the staff after birth, and 88.6% of them said it was because of routine procedure (see Appendix 4). This variable (skin contact) fails logistic regression because of low numbers therefore only simple percentages are shown.

The "Room-in" variable here refers to where the baby stays and the gradient of duration of mother-infant contact before discharge. "24-hr room-in" means the baby stays with the mother 24-hours per day. Baby goes to the nursery for medical inspection or hospital routine for less than 1 hour, and less than twice in a day. "Daytime room-in" refers to baby stays with the mother from roughly 9 am to 6 pm and goes to nursery overnight. "With me for feeding" refers to that either the nurses bring the baby to the mother or call the mother to feed in the nursery, or both when the staff identifies the baby as needing to feed. "Nursery" means baby stays in the nursery most of the time.

Table 9.29: Postpartum variables and the relationships between types of infant feeding.

Variable	No	At discharge (%)				At 3 month (%)			
		FF*	Mixed*	EBF*	P	FF*	Mixed*	EBF*	P
Baby with whom immediately after birth					<0.001[A]				0.028[A]
Self	18	0	100.0	0		33.3	66.7	0	
Father	3	100.0	0	0		100.0	0	0	
Staff	477	37.1	55.3	7.5		54.3	36.7	9.0	
Not sure	6	100	0	0		100.0	0	0	
Room-in					<0.001				<0.001
24-hr	24	0	0	100.0		20.8	29.2	50.0	
Daytime	205	8.8	88.3	2.9		28.3	58.5	13.2	
With me for feeding	133	30.8	64.7	4.5		64.7	32.3	3.0	
Nursery	142	89.4	10.6	0		88.0	12.0	0	

**FF: formula feeding. Mixed: mixed feeding. EBF: exclusive breastfeeding.*
[A]: by exact test due to low numbers.

Only those who said the baby was with staff immediately after birth had exclusive breastfeeding, both at discharge and 3 months. Those who were with mother had least formula feeding at discharge and 3 months, although there were few of these mothers and conclusions should be drawn with caution. As the time of room-in increases, there is a trend of decrease in formula feeding and increase in exclusive breastfeeding both at discharge and 3 months. None of the babies stayed in the nursery were exclusively breastfed at discharge and 3 months.

Table 9.30: Relationships between postpartum factors and change of breastfeeding behaviour.

Variable	Less BF[1]			Not changing[1]			More BF[1]		
	No at risk	% decrease	p	No at risk	% unchanged	p	No at risk	% increase	p
Baby with whom immediately after birth			0.52			0.16			0.32
Mother	18	4.65		18	66.7		18	0	
Father	0	--		3	100		3	0	
Staff	300	95.4		447	63.5		441	11.6	
Not sure	0	--		6	100		6	0	
Room-in			<0.001			<0.001			0.015
24-hr	24	50.0		24	50.0		0	0	
Daytime	187	26.2		205	62.4		199	14.1	
With me for feeding	92	64.1		133	46.6		127	9.5	
Nursery	15	60.0		142	85.9		142	7.8	

[1]:More breastfeeding was defined as from discharge to 3 months, women shifted from formula feeding to either mixed feeding or exclusive breastfeeding, and from mixed feeding to exclusive breastfeeding. Those who were exclusive breastfeeding were excluded from the denominator. Less breastfeeding was defined from discharge to 3 months; women shifted from exclusive breastfeeding to either mixed feeding or formula feeding, and from mixed feeding to formula feeding. Formula feeding at discharge was excluded from the denominator. Not changing means the feeding method remained the same between discharge and 3 months.
--: Not applicable.

Those who had daytime room-in were least likely to decrease and most likely to increase in breastfeeding.

Table 9.31: Odds ratios for the postpartum factors and the type of breastfeeding[1] at discharge and 3 months.

Discharge										
Variable	UOR[†]	95%CI	AOR[a]	95%CI	AOR[b]	95%CI	AOR[c]	95%CI	AOR[d]	95%CI
Room-in										
24-hr	--	--	--	--	--	--	--	--	--	--
Daytime	1		1		1		1		1	
With me for feeding	0.22	0.12-0.40	0.14	0.05-0.34	0.16	0.06-0.44	0.032	0.005-0.20	0.02	0.003-0.17
Nursery	0.01	0.006-0.02	0.01	0.005-0.04	0.01	0.004-0.04	‖	‖	‖	‖
3 months										
Variable	UOR[†]	95%CI	AOR[a]	95%CI	AOR[b]	95%CI	AOR[c]	95%CI	AOR[d]	95%CI
Room-in										
24-hr	1.50	0.53-4.20	0.43	0.14-1.37	‖	‖	‖	‖	‖	‖
Daytime	1		1		1		1		1	
With me for feeding	0.22	0.14-0.34	0.60	0.28-1.28	0.81	0.05-13.7	‖	‖	‖	‖
Nursery	0.05	0.03-0.10	0.44	0.18-1.09	0.29	0.02-4.69	‖	‖	‖	‖

UOR[†]: Unadjusted Odds Ratio.

a: adjusted for age, education, live with parents-in-law and feeding history (level 1).

b: adjusted for age, education, live with parents-in-law, feeding history and attitudes of mother-in-law, husband and health professional (Level 2).
c: adjusted for age, education, live with parents-in-law, feeding history and attitudes of mother-in-law, husband and health professional, information from mother-in-law, health professional and internet(Level 3).
d: adjusted for age, education, live with parents-in-law, feeding history and attitudes of mother-in-law, husband and health professional, info from mother-in-law, health professional and internet and attendance of antenatal education (Level 4).
‖: *Adjustment unstable due to small numbers.*
--: ≥ *one zeros in the logistic regression model and failure to predict or does not fit into the model..*

At discharge, the probabilities of breastfeeding tend to increase, as the time of room-in increases, and this trend remain true for breastfeeding at discharge after the increasing levels of adjustment. The effects of the duration of mother-baby contact during hospitalisation became insignificant after 3 months with adjustment.

Table 9.32: Odds ratios for the postpartum factors and the increase and decrease of breastfeeding[1]

Decrease [1]										
Variable	UOR[†]	95%CI	AOR[a]	95%CI	AOR[b]	95%CI	AOR[c]	95%CI	AOR[d]	95%CI
Room-in										
24-hr	2.82	1.19-6.68	8.54	2.95-24.7	49.6	6.64-370	13.4	0.61-291	16.6	0.63-439
Daytime	1		1		1		1		1	
With me for feeding	5.03	2.90-8.60	2.96	1.28-6.53	1.79	0.49-6.58	2.23	0.15-32.5	1.18	0.02-60.5
Nursery	4.22	1.43-12.5	1.58	0.33-7.60	3.14	0.03-353	‖	‖	‖	‖
Unchanged [1]										
Variable	UOR[†]	95%CI	AOR[a]	95%CI	AOR[b]	95%CI	AOR[c]	95%CI	AOR[d]	95%CI
Room-in										
24-hr	0.60	0.26-1.41	0.62	0.25-1.54	0.67	0.26-1.78	1.16	0.38-3.6	1.11	0.36-3.47
Daytime	1		1		1		1		1	
With me for feeding	0.53	0.34-0.82	0.55	0.32-0.95	0.48	0.27-0.87	0.38	0.2-0.75	0.48	0.23-0.97
Nursery	3.67	2.12-6.37	4.16	2.07-8.34	4.57	2.22-9.37	4.19	1.87-9.37	8.41	2.76-25.6
Increase [1]										
Variable	UOR[†]	95%CI	AOR[a]	95%CI	AOR[b]	95%CI	AOR[c]	95%CI	AOR[d]	95%CI
Room-in										
24-hr	--	--	--	--	--	--	--	--	--	--
Daytime	1		1		1		1		1	
With me for feeding	0.64	0.31-1.30	1.88	0.70-4.74	2.25	0.58-8.64	3.05	0.24-39.3	0.11	0.001-20.6
Nursery	0.51	0.25-1.07	1.39	1.93-21.0	‖	‖	‖	‖	‖	‖

UOR[†]: Unadjusted Odds Ratio.
a : adjusted for age, education, live with in-laws and feeding history.(Level 1)
b: adjusted for age, education, live with parents in law feeding history and attitudes of mother-in-law, husband and health professionals.(Level 2)
c: adjusted for age, education, live with in-laws, feeding history and attitudes of mother-in-law, husband and health professional and info from mother-in-law, health professional and internet.(Level 3).
d: adjusted for age, education, live with in-laws, feeding history and attitudes of mother-in-law, husband and health professional and info from mother-in-law, health professional and internet and mode of delivery.(Level 4)
[1] :Increase in breastfeeding was defined as from discharge to 3 months, women shifted from formula feeding to either mixed feeding or exclusive breastfeeding, and from mixed feeding to exclusive breastfeeding. Those who were exclusive breastfeeding were excluded from the denominator. Decrease of breastfeeding was defined from discharge to 3 months; women shifted from exclusive breastfeeding to either mixed feeding or formula feeding, and from mixed feeding to formula feeding. Formula feeding at discharge was excluded from the denominator.
--: ≥ one zeros in the logistic regression model and failure to predict.

After adjusting for the 1st level, those in the "24-hr room-in" and "with me only for feeding" groups were more likely to decrease in breastfeeding than daytime room in; while those who placed their babies in the nursery were more likely to increase in breastfeeding, but the numbers in each group are small. Moreover, all of those had 24hr room-in were breastfeeding at discharge. The nursery group had higher odds to remain unchanged after adjustment.

9.5 Interaction

In this part of the study I want to examine the consistency of an observed relation across two or more subgroups. I only tested interactions among variables that have reasonable logical basis. Exhaustive exploratory examination of many subgroups is almost certain to throw up some spurious significant interactions.

In this section, I have hypothesised the following interactions. Women who lived with vs.

without in-laws may have different characteristics. Here I test the interactions between family type (living with or without in-laws) and women's level of education, perceived importance of mother-in-law and husband's attitudes. The outcomes measurements are any breastfeeding at discharge and 3 months. I was not able to perform logistic regression on husband's attitudes due to zeros in cells which cause interaction terms to be dropped from the models.

Table 9.33: Breastfeeding at discharge and the level of education and living with in-law

Family type	Lives with in-laws			Does not live with in-laws		
Education	No	%BF	P	No	%BF	p
High school	107	22.4	<0.001	19	94.7	0.04
Inst. of technology	92	26.1		88	81.8	
University	49	87.8		149	92.0	

There is interaction between the level of education and family type (p<0.001) at discharge. The effect of living without in-laws on breastfeeding is OR=62.3 (5.21-742) for the least educated group, OR=12.8 (5.4-30) for the middle group and OR= 1.6 (0.56-4.51) for the most educated group. This reveals that the effect of living with in-laws is different across educational groups. The effects tend to be bigger in the less educated group at discharge.

The same tendency of effect modification is also present at 3 months. However, due to zero women in the least educated group who lived with in-laws and were breastfeeding at 3 months; it is difficult to test the interaction statistically.

Table 9.34: Breastfeeding at discharge and the attitude of mother-in-law and living with in-law

Family type	Live with in-laws			Live without in-laws		
Mother-in-law's attitude	No	%BF	P	No	%BF	p
Important	163	25.8	<0.001	41	58.5	<0.001
Somewhat	67	64.2		95	93.7	
No effect	18	33.3		120	95	

The test of interaction between attitudes of mother-in-law and family type (living with in-laws or not) at discharge is significant (p=0.01). For those who reported mother-in-law's attitude as important, the effect of not living with in-laws on breastfeeding at discharge is OR=4.07(1.93-8.57), and OR=8.28(2.91-23.5) for the middle group and OR=38(7.45-193) for those who said no effect. There is interaction that the effect of living with in-laws differs across different groups of perceived importance of mother-in-law's attitude. The effect of living with in-laws has strongest influence among those who perceived mother-in-law's attitude as important, therefore, least breastfeeding at discharge. It is difficult to test the interaction at 3 months because none of those who lived with in-laws and said mother-in-law is important were breastfeeding (n=163, 0%); in contrast, all 120 women who did not live with in-laws and said "no effect" were breastfeeding at 3 months.

9.6 Summary:

Patterns of breastfeeding behaviour

- From discharge to 3 months, there was an increase in formula feeding (36.9%-54.4%) and exclusive breastfeeding (7.1%-8.5%); and a decrease in mixed feeding (55.9%-37.1%).

Age:

- Women aged 25-29 were least likely to breastfeed at discharge, but they were more likely to increase in 3 months. And the age effects were not significant among other age groups.

Education:

- There is a positive relationship between the degree of education and breastfeeding both at discharge and 3 months. The more educated women tended to be more likely to change, and the least educated women were least likely to increase in breastfeeding.

Family type:

- Living with parents-in-law has a negative impact on breastfeeding at discharge, and the impact got stronger (AOR from 12.6(95%CI: 7.09-22.41) at discharge to 62.37 (95%CI: 30.6-127.2) at 3 months). Also those who lived with in-laws had less odds of increasing and more odds of decreasing breastfeeding.
- There is an association between family type and education, attitudes of mother-in-law, husband, and information from mother in law, i.e. better educated women were less likely to live with their parents-in-law ($p<0.001$).
- Those who lived with in-laws were more likely to report that their mother-in-law's attitudes were important ($p<0.001$); two groups i.e. husband's attitudes as no effect ($p<0.001$) and those for whom the information from mother-in-law was the major source ($p<0.001$) were less likely to breastfeed at discharge and 3 months.

Mother-in-law:

- There is a negative relationship between the impact of mother-in-law's attitude and breastfeeding at discharge and 3 months. And those who perceived mother-in-law's attitude as important tended to be less likely to increase and more likely to decrease in breastfeeding.
- There is a negative relationship between the significance of the information from mother-in-law and breastfeeding at discharge. However, after adjusting for the socioeconomic factors, the significance of information from mother-in-law has become positively associated with more breastfeeding at 3 months.
- There is an interaction between the attitudes of mother-in-law and husband. Those who reported mother-in-law's attitude as important were more like to report husband's attitudes had no effect on them, and vice versa ($p<0.001$).

Attitudes of husband:

- The significance of husband's attitudes is positively related to more breastfeeding at both discharge and 3 months. Those who said husband's attitudes had no effect were more likely to decrease and less likely to increase in breastfeeding.
- This factor interacts with education. The more educated women were more likely to perceive husband's attitudes was important to them and vice versa ($p<0.001$).

Health professionals:

- Importance of health professional's attitudes did not show any impact on breastfeeding behaviour at discharge and 3 months.
- Information from health professional seems to encourage breastfeeding at discharge but discourage breastfeeding at 3 months.
- Education has associations with both the perceived attitudes and significance of information from health professionals. The more educated women tended to perceive the professional's attitudes and information from them as less important (both $p<0.001$).

Books and Internet

- Use of books was not associated with feeding behaviour at discharge and 3 months after adjustment. However, those who read books more had lower odds of an increase in breastfeeding whereas the use of Internet was not related to increase or decrease in breastfeeding. Those who used the Internet more were more likely to stick to their initial feeding behaviour after levels of adjustment.
- Education has associations with both use of book and Internet. The more the women were educated, the more likely they drew information from books ($p<0.001$) and the Internet ($p<0.001$). The impact of effect modification is stronger in the use of books than the Internet.

Antenatal education:

- Attendance of antenatal education was not related to feeding behaviour at discharge and 3 months. It also failed to impact on increase and decrease of breastfeeding.

Time of feeding intention formation

- Later intention formation was related to more formula feeding both at discharge and 3 months. Women in this group were also less flexible in changing feeding behaviours.
- Age and education both interact with this variable. The older and more educated the women were, the more likely they decided on feeding methods early.

Mode of delivery:

- After adjustments, women who had CS were much less likely to breastfeed at discharge, though the effect became weaker after 3 months. They were also more likely to change their feeding behaviour, to the direction in favour of breastfeeding.

- Mode of delivery has relationships with many social factors including family type, perceived importance of husband's and mother-in-law's attitudes and information from mother-in-law. Those who had CS were more likely to live with their in-laws, perceive mother-in-law's attitudes and information as important, and husband's attitude had no effect on them (all $p<0.001$).

Intrapartum epidural:

- The use of intrapartum epidural seems to have little association with breastfeeding at discharge, but there was an association with change in the period to three months, with increase among those not fully breastfeeding and decrease among those with either level of breastfeeding. The former effect became insignificant after adjustment. Women who had epidural appeared more likely to change their feeding behaviour, mainly in favour of breastfeeding.

Early skin contact:

- The majority of babies were born and being handled by health professional for routine procedures. This leaves small numbers in other groups and interpretation is difficult.

Room-in:

- Only 4.8% of women reported 24-hr rooming-in, all of them were exclusively breastfeeding at discharge and half of them remained so at 3 months.
- There is a dose-response relationship between the duration of rooming-in and probability of breastfeeding at discharge, but this becomes insignificant at 3 months.

10. Discussion

10.1 Strengths and limitations of this study

Strengths:

This study employed both qualitative and quantitative methods to explore women's ideas and experiences around childbirth and breastfeeding. The survey shows general trends and the larger picture of the overall situation as well as the formal confirmation of the association with the factors; whereas the in-depth interviews with women provides deeper insight and individual views. Moreover, this is the first study either in English or Chinese to follow women up to 3 months with comprehensive questionnaires to investigate the complex dynamics between infant feeding and family life. This is also the only study looking at specific social factors in a Chinese speaking society (family type, husband and mother-in-law) and their relationships between infant feeding behaviours.

Also, due to culture and tradition, this study has the advantage of high compliance with little refusal. Furthermore, as communication technologies are widely available and nearly all households have at least one telephone, I had little problem of follow up.

Like many western societies, women in Taiwan become isolated after childbirth especially in urban areas like Taipei where the study took place. The general experience is that women welcomed my visits or telephone during postpartum duration, and they were willing to talk about most of the issues, with some inhibitions concerning body parts and sexuality.

Limitations

One of the difficulties I encountered was clinicians' strong interference in some questions I put in the original questionnaires. As a result, I could only obtain information on the prevalence of some obstetric interventions but was not allowed to ask more specific questions regarding women's view on the quality of care and their views on some hospital practices.

This study only included 2 hospitals in the capital, which is not representative of the whole population. Multi-centre studies including more diverse population would be more appropriate to generate representative results but resources did not allow this.

Moreover, though we were able to re-contact those lost to follow-up (survey and interview A), they all decided to withdraw from the study and wished their information to be excluded from the analyses. The number was small and unlikely to change the conclusion, but the non-respondents may have different characteristics from the respondents.

All the information on the major events were obtained based on women's recall which has been confirmed as a valid tool [312]. Though the duration of recall was short therefore the validity of the recall could be of better quality [313], there may be limitations of recall bias[314]. There is anecdotal information locally that the data documented in the medical charts may not be entirely reliable especially events like fetal distress or indication for

surgical delivery. Hospitals or individual doctors may need to "make-up" or "document" some indications so that an operation can be covered by the National Insurance.

Because outcomes in some groups had zero or 100%, there were failures in fitting of logistic models; this made it difficult to get meaningful estimates and tests in some situations.

10.2 Patterns of breastfeeding behaviour

These results show breastfeeding prevalence was not high either at discharge or 3 months; the percentages of women at discharge were 7.1% exclusive breastfeeding 56.0% mixed feeding and 36.9% formula feeding with the corresponding percentages at 3 months being 8.4%, 37.1% and 57.4%. These figures show a marked net decrease in any breastfeeding over 3 months, from a not very high level of 63.1% to 42.6%. Exclusive breastfeeding, however, did not show a net decline and even a slight rise, though not statistically significant. According to the qualitative study, once discharged from hospital, some women regained better control of their life and could better exercise their own will. Many of these would have increased breastfeeding. On the other hand, many women living with in-laws would have stopped. The physical discomfort like the pain from CS incision or episiotomy started to ease away by the time of discharge.

10.3 The traditions during confinement

The qualitative phase found that many Taiwanese women still follow the traditional customs during confinement in different ways with various levels of compliance. According to the older generation, the traditional practice during confinement, by its nature, is to assist maternal recovery from childbirth and encourage mother-baby contact by removing all domestic chores and providing nutritious foods. However, many in the younger generation perceived that the traditional practice had been a hurdle to breastfeeding.

10.4 Socio-demographic factors and significant others

This current study confirmed a well-established phenomenon in industrialised countries that women of older age and with higher education were more likely to breastfeed. While employment and previous feeding experience did not have a significant impact, I found living with in-laws was a strong factor working against breastfeeding in both the qualitative and quantitative phases.

In this study, women who lived with in-laws tended to be younger and less educated, and the effects of the attitudes and the information from mother-in-law on them are shown to be profoundly against breastfeeding. Furthermore, the negative impact on breastfeeding remains true after adjusting for age and education, and that of mother-in-law gets even stronger at 3 months. In the qualitative interviews, women revealed that living with in-laws can bring many issues like conflicting ideas of child care and "doing the month", baby's weight gain and lack of privacy. It is noteworthy that those who lived with in-laws had lower breastfeeding prevalence even at discharge. This is consistent with the qualitative finding that before discharge, women were not certain about what would happen after returning home, so that they were not bothered to try breastfeeding. This is also a reflection of lack of autonomy

when living with in-laws. This situation is further exacerbated after childbirth due to the traditional practice and social constrain during the confinement *("tso yueh tzu").* As described previously this practice not only has physiological intent (recovery from childbirth) but also has profound symbolic significance i.e. the husband's family shows off their wealth and proof to the community as well as the women's family that they treat their daughter-in-law very well. And most women instinctively know that it is never appropriate to disagree with in-laws during confinement. It can also be partly explained by the fact that the majority of women living with in-laws had them as the baby's caregiver after they return to work. So the women foresaw that their in-laws would not support breastfeeding, and in order to avoid potential tension, they gave it up in the first place. Also the qualitative interviews indicated that when there is a conflict between newly delivered women and mothers-in-law, the husbands often tend to step aside rather than get involved.

It is not surprising that the perceived importance of mother-in-law's attitude is accompanied by the information she hase given. Mother-in-law factors interact with family type and level of education as discussed in the previous section. Information given by mother-in-law seems to discourage breastfeeding. However, this factor is highly related to family type (those who lived with in-laws had much higher odds to receive information from mother-in-law). After adjusting for sociodemographic factors, there is an effect reversal which might be due to those who were not living with in-laws and who valued her information tending to breastfeed.

As aforementioned, the evidence of the relative importance of other family members other than husband or father in promoting and supporting breastfeeding is lacking [183, 272]. However, some experts have identified the expectant mother's own mother as exercising a powerful influence. It is postulated that this influence can be positive or negative; depending on the latter's own infant feeding experience. For the same reason, other women may also have be a positive or negative influence, whether these are within the mother's kinship or friendship network. This study identified that the woman's mother-in-law plays an important but negative role in breastfeeding. This can be explained by tracing back 25-30 years ago, when the breastfeeding prevalence was as little as 5%[147], and although there is no quality data, the trend of very low breastfeeding prevalence persisted for nearly 20 years[44]. Therefore the majority of new mothers' mothers-in-law themselves did not breastfeed, and the lack of breastfeeding experience makes them hold rather negative attitudes. Education programmes targeting grandmothers could be an effective public health measure to improve the breastfeeding prevalence, in the medium term at least.

This current study found that the husbands played an important role in supporting breastfeeding in this study, and there is an inverse relationship between the perceived importance of husband and mother-in-law ($p<0.001$). In the survey, whether husband's attitude was pro or against breastfeeding was not identified, therefore, it is difficult to specify the direction of effect. However, there is a significant association between the importance of husband and more breastfeeding. It would be of interest to find out which is exposure and which is outcome. The general impression gained from the qualitative interviews is that the many men have relatively little idea about infant feeding, and generally they are fine with either. Those motivated breastfeeders tend to be determined to breastfeed well before birth, as they are more likely to be better educated and have better social-economic status, so do their

husbands. Therefore, it is common that the couple have a consensus on most of the issues around birth and childcare, including breastfeeding, before the birth. Or it may have been that the devoted breastfeeders have stronger personality and they educate their husbands to be their advocates.

As revealed in the qualitative phase, there were also some men who disliked breastfeeding immensely. Though not directly studied further in the current research, there is information suggesting that they may have seen their grandmothers' or some elderly women's breasts became very "unattractive" after repetitive childbearing and breastfeeding. Interference of sex life is also some men's concern. But it is difficult to tell whether these are reasons or "excuses" as some men feel that they have to "compete" with their children for women's attention and time.

Health professionals' attitudes were related to more breastfeeding at discharge after adjusting for socio-demographic factors, but the effect was removed after further adjustment. In general, the reported importance of health professional's attitudes had little impact on breastfeeding both at discharge and 3 months.

There is a trend that those who perceived the information given by health professionals as important are more likely to breastfeeding at discharge, but less likely at 3 months (see table 10.16) .In the sites of the study, health professionals have pressure to "educate" women with knowledge related to breastfeeding due to the local breastfeeding friendly hospital assessment. However, this has been criticized in that health professionals bombard women with too much information with no appropriate communication skills within relatively short period of time. Also in the qualitative interviews, women descried being "talked into breastfeeding" and gave up after discharge. It is not clear whether this information helps women to breastfeed, or that it is the kind of women who would breastfeed who are more susceptible to information. Several international studies suggest that current pre-service training does not result in health professionals having sufficient competence to effectively support breastfeeding [315, 316].

10.5 Books and Internet

Consistently in the survey and qualitative interviews, use of books and Internet is highly related to education level, especially Internet. It seems that use of books as a major source works against breastfeeding. There are some possible explanations. First is that women define "book" differently, those who were less educated may have read "magazines" with lots of information on infant formula, and report them as books and major source of information. Moreover, though there are many parenting books available in Taiwan, only one book that is commonly available contains good information on breastfeeding; the rest are formula feeding oriented with erroneous information regarding breastfeeding.

The impact of the Internet is consistently one of encouraging breastfeeding at discharge, but the effect at 3 months is less profound. Similar to books, the contents available on Web are a mixture of correct and incorrect information. It also depends on what key words women use when doing a search. When searching on "breastfeeding" (traditional Chinese), the search engine gives one a list of governmental and mother-to-mother support group sites (see below);

but if using keywords like "infant feeding", "baby feeding" or "baby food", the search engine comes up with lots of information related to formula companies and suggestions on weaning at 3-4 months. There are 2 web-based mother-to-mother support groups (Taiwan Breastfeeding Association and Baby's Garden), both of them established in 2003. There is not enough information to say if the sites have real impact on supporting breastfeeding or not.

The qualitative interviews found that more educated women obtained their information primarily from books and Internet and that from their social network seemed less influential. Information concerning breastfeeding from mother-in-law was detrimental to breastfeeding, consistently with the survey. Breastfeeders had their rationales to counter-balance these messages, while formula feeders tended to accept messages that are against breastfeeding.

10.6 Antenatal education

After adjusting for potential confounders, we found antenatal education had no impact on breastfeeding. The reasons for this lack of association can be multi-factorial. As described previously, nearly all the antenatal education is run as lectures for hundreds in the audience with nearly no interaction. This kind of teaching method is unlikely to equip women with all the practical skills they need to breastfeed, which is consistent with the qualitative finding that women said the antenatal sessions did not give them any skills to breastfeed, and found these sessions not helpful. Moreover, the antenatal education covers everything from routine check-ups, Caesarean Section versus normal birth, to cord-blood banking. Though each hospital has its own curriculum, the contents do not differ very much, and breastfeeding is generally incorporated with baby care or weaning. The locally accredited baby friendly hospitals may have breastfeeding as a separate session, but never as a breastfeeding specific education programme.

As described by Hoddinot & Pill [317] in their qualitative study, women who see breastfeeding are more likely to breastfeed. They also found that hands-on sessions are the preferred teaching methods for learning practical skills like breastfeeding. However, some women in Taiwan go to company funded antenatal sessions alongside hospital based ones. And sometimes even hospital representatives use an independent module on say, infant feeding and weaning foods, because of staff's low motivation teaching due to the reasons described in previous session. Even if the sessions are seemingly run by hospital staff, it is common in Taiwan that formula companies fund these sessions and have their personnel collecting participants' information for further contact and distributing free gifts. All these may explain why antenatal education may not work.

10.7 Commercial presence

As described earlier, Taiwan has very weak regulation over marketing breastmilk substitutes and violation of the International Code of marketing breastmilk substitutes is evident. Though it is required by the local breastfeeding promotion programme that hospitals cannot disseminate any object that has any commercial involvement, it is not uncommon that women receive something indirectly or immediately after discharge.

Due to the huge sum of money involved, controlling the infant formula market has become a

political and difficult battle. In 2003, there are more than 130 types / brands of infant formula approved and registered by the government and available on the market[318]. It is common that companies sponsor many things from stationery, salaries of personal secretaries, to overseas trips and research grants, even hospital buildings. There is considerable conflict to deal with all these financial issues when promoting breastfeeding.

Like many western countries, Taiwan has been experiencing steady fertility decline in recent decades; therefore the infant formula market has been naturally shrinking. Formula companies started to launch new products like "pregnancy formula" emphasizing the "special nutrition needs during pregnancy, and good maternal intake benefits two (mother and fetus)". In 2002, an invention called "postpartum formula" was firstly available in Taiwan, saying that breastfeeding is best for your child, "But if your diet is less than optimal...if you are not breastfeeding, it is good for you too." This is sending out a message that "you need to have a perfect diet to breastfeed; otherwise, your child will suffer". Unless the government tighten up on the regulation and have radical interventions, the hospitals or clinics are unlikely to self-regulate their relationships with the companies voluntarily.

Commercial promotion of infant formula before and / or after discharge has also been addressed in this study. Women reported direct contact by formula company personnel both before and after birth. Companies provide antenatal education to promote their products and also to gather women's information like contact numbers and due dates. Postpartum telephone contact was the most commonly cited way of commercial contact. Mother and toddler's formula had also been the backdoor ways to promote infant formula.

10.8 Hospital practices

Women in Taiwan have little choice regarding intrapartum interventions, and the majority of those studied here received standard care. This study also builds up a picture of a quite medicalised birthing environment in Taiwan (see Appendix 4). In this population, the majority of women had episiotomy (91.5%), IV drip (90.9%), continuous fetal monitor (96.7%), frequent vaginal exam (94.5%) and lithotomy for the 2nd stage of labour (94.2%). Moreover, 37.6% of women who gave birth vaginally received intrapartum epidural alagesia. In this study, the CS rate was 34.6% with 29.8% elective CS and 4.8% emergency CS.

The qualitative interviews revealed that many of the intrapartum interventions like CS, episiotomy and epidural, had continual effects on women's ability to initiate breastfeeding. As the routines are applied to almost everyone, these effects were nearly universal. Consistent with the survey, everyone in the qualitative interview (stage A &B) had episiotomy. The embarrassment and lasting effects of this surgical procedure had considerable impact on women's postpartum life. It is a common complaint that the wound of episiotomy made sitting very uncomfortable, and compromised their ability to breastfeed in the sitting position.

The qualitative study found that the lack of proper communication during labour added tension and distrust to health professional- patient relationships, and this tense relationship extended into the postpartum period in some cases.

Moreover, women's recollection of intrapartum events seemed to evolve as time moved on.

There is a pattern that women started with higher level of satisfaction, and then gradually recalled the more negative experiences.

It is still a common misconception that CS is a safer way to give birth. Some women who had CS said that they did not know there is a "pain" element to CS. They thought CS would be "pain-free" and postpartum pain was one of the big hindrances of breastfeeding before discharge.

After adjusting for confounders, women who had CS were less likely to breastfeed at discharge, but the effect became insignificant after 3 months. The use of epidural seems not related to breastfeeding at discharge and 3 months. Nevertheless, women having CS or epidural were associated with increase in breastfeeding, which may due to the discomfort and being temporarily incapacitated during hospitalisation; and regaining physical strength after discharge. However, it is difficult to tell whether CS reduced breastfeeding or women who opted for CS also opt for formula in this study. It could be a combination of both that led to the observed effects of this study. Moreover, some hospital practices like mother baby separation and pre-lacteal feeds are more common in those with these procedures. In this study, of those who had CS, 73.0% of their babies ended up in the nursery in comparison with 15.0% of those who had VB ($p<0.001$). Women who had epidural were also more likely to place their children in the nursery ($p<0.001$). It is unclear whether this is due to maternal, familial factors or health professionals' pre-conceived concepts that women who had CS or epidural need more rest, so they are less likely to reinforce the room-in policy. This could also partly explain the increase in exclusive breastfeeding prevalence between discharge and 3 months in women delivered with more medical interventions. Despite explicit policy, the majority of babies were with the staff (94.6%) immediately after birth, and when asked for the reasons with staff, 88.6% said for routine care.

In the qualitative interviews, women who had early skin contact expressed this as a very positive experience. Those who were committed breastfeeders said they had to "fight" in order to get "proper" early skin-to-skin contact. This group of women had a stricter definition of skin contact.

Moreover, few (4.8%) women had 24-hr rooming-in. Though the implementation of rooming-in may not have been a success, there is still a dose-response relationship between the time of rooming-in and breastfeeding both at discharge, but there no association was found at 3 months. In a search of the literature, there is no strong evidence that room-in on its own influences the type and duration of breastfeeding, except for the above-mentioned non-systematic review [319]. Rooming-in is, however, an obvious requirement for breastfeeding on demand.

Though most of the successful breastfeeders said rooming-in has been very important for them to initiate and sustain breastfeeding, only a small proportion (4.8%) of those in the survey had 24-hr room-in (see above). Number one reason given for blocking 24-hour room-in was maternal exhaustion. The interviews revealed a complicated picture of social expectation (including the traditional practice, and women and their family's expectation), maternal instinct (to care and be close to the baby) and health professional's pre-conceived

belief (women need to rest and room-in is physically demanding). Another managerial difficulty was the mixing up of gynaecological and obstetric wards which made rooming-in difficult.

Those who had experience giving birth before the governmental initiative said that the local breastfeeding promotion has made the hospital environment more breastfeeding friendly. But some of the WHO/UNICEF and locally recommended practices have not been properly implemented or were being misinterpreted, which made breastfeeding an even more stressful experience.

10.9 Breastfeeding support

In the current study, most women returned home with minimal follow-up support. As one of the criteria for becoming locally baby friendly, hospitals have to provide contact details of locally available support groups. The majority of hospitals simply give women the telephone number of the nursery or maternity ward, and had never audited the utilization and effectiveness of this support.

Lay support is effective in promoting exclusive breastfeeding but the strength of its effect on the duration of any breastfeeding is also uncertain. A more recent randomised controlled trial was conducted in London and south Essex [249] recruiting 720 women considering breastfeeding. They aimed to investigate whether offering volunteer support from 28 National Childbirth Trust accredited counsellors in breastfeeding would result in more women breastfeeding. In this study, only 62.5% (210/336) of the women in the intervention group made contact with a counsellor postnatally, but 73% (123/179) of those who did rated them as very helpful. The 20% (67/336) who met with counsellors during the postnatal period were significantly more likely to continue to breastfeed than those who contacted by telephone (43%, n=143) or those who had no contact (37%, n=126). The authors concluded that women valued the support of a counsellor in breastfeeding, but the intervention did not significantly increase breastfeeding prevalence, perhaps because some women did not ask for help. This finding reflects the reality of many health promotion activities. Many women do not want to identify themselves as having a "problem" or appear to be foolish; it is also possible that women do not even know what to ask.

While the intervention of this trial included peer support, how the support was provided was different, leading to different results. These results led to the debate of how to run a sustainable voluntary programme.

A preliminary study [320] of training peer counsellors in Taiwan was launched in 2004. All the peer counsellors (who did not have to have breastfeeding experience) had to attend 3-day (18-hour) breastfeeding education programme. They visited women once within the first month postpartum and also provided telephone support. Though the initial results seem positive on breastfeeding prevalence, there are issues of how to sustain such "costly and super-imposed" support and the feasibility of its long-term existence.

10.10 Work and breastfeeding

The law in Taiwan gives women 8-weeks maternity leave, but some women return to work early in fear that they may lose their job. Though there are no formal statistics, pregnant women still suffer from discrimination in the work place and some face to pressure to resign. In this study, more employed women breastfed before discharge ($p<0.05$), but there was no statistical difference between having a job or not and feeding type at 3 months.

Once returned to work, using pumps to express and store breastmilk was very common among working mothers in our current study. According to the qualitative findings, the working environment is not friendly to breastfeeding women, and even their colleagues put pressure on them. Lack of time and facilities was a common theme for working breastfeeding women. Even though the law gives them two 30-minute breaks per day to express breastmilk, the regulation was not enforced and women often had to express in the fear that this might impact on their performance assessment.

11. Conclusion

It has been identified by this study that women's social network played an important role in the decision and action of infant feeding. The effect of the health professionals seemed less influential and had limitations because the majority of women decided how to feed at least before the mid of pregnancy. Moreover, though there were some women who increased in breastfeeding, the general trend was to decrease, and a considerable proportion of women remained unchanged in their feeding methods from discharge to 3 months. It may be prudent to focus on support for those who have intention to breastfeed in terms of resource allocation.

The current leading group of breastfeeding promotion in Taiwan is comprised only of health professionals. The lack of involvement of other disciplines can make the whole movement less effective and self-limiting with only deviated opinions.

The local baby-friendly hospital has been the centre of the breastfeeding politics; however, "little learning is dangerous", and the partial adaptation of the global standard may be not healthy to breastfeeding promotion in the long run.

This current study identified several factors that can be of public health interest in terms of breastfeeding promotion. Some recommendations for future policy formulation are:

- Public education: This study revealed that women's immediate social network has tremendous impact on the infant feeding behaviour. Messages targeted to grandparents especially mothers-in-law and husbands can be of public health significance. Information which counteracts the old image that breastfeeding symbolised poverty and formula is equivalent and even superior to breastmilk has to be carefully tailored and widely delivered. Further studies looking at mother-in-law's common perceptions and the reasons for their negative influence on breastfeeding can be informative on future policy.
- Health professional education: Though not directly studied, women's in-hospital experience showed that the health professionals were not adequately equipped to provide practical support. There is a need for more practical and hands-on training of health professionals. Education programmes including consultation and communication skills are also important for the Taiwanese health professionals.
- Antenatal education: This study found that the currently available antenatal education in Taiwan has limited impact on breastfeeding. To train health professionals with the skills how to conduct more interactive antenatal sessions with demonstration and practice, rather than giving lectures all the time would be helpful. Encouraging hospitals to run effective antenatal sessions with reasonably small numbers of participants (e.g.15-20) rather than gather huge crowds may encourage more interaction and increase the effectiveness. More studies are required into the effectiveness of antenatal sessions on health and behavioural outcomes to inform future formulation of educational sessions.
- Audit and proper implementation of the local baby-friendly hospital programme: This study revealed that malpractices that jeopardise breastfeeding still happen in hospitals committed to promote breastfeeding. Audits including women's experience and a

mentoring system with an atmosphere of approval of good practice and penalty to the repeated offenders can be one of the ways to reinforce best practice standards.

- Birth environment: This study provided an overview of the birthing environment in Taiwan, and showed that some of the obstetric interventions were quite influential on breastfeeding. Initiatives to prevent the over-use of non-necessary interventions around childbirth, which can lead to maternal discomfort and increased the chance of separation, may have a significant impact on breastfeeding.
- Formula companies: The presence and influence of formula companies was shown to have negative impact on breastfeeding both at community and individual levels. Thus, to regulate their presence by tightening up legislation can play an important role in breastfeeding promotion.
- Maternity leave and work place: Though not directly studied, even women committed to breastfeed encountered difficulties in the work place. Legislation that gives women longer maternity leave and flexible working hours with subsidy, that encourages employers to provide breaks and facilities to express and store expressed breast milk, and provides quality affordable childcare near work, may have significant impact to increase the continuation of breastfeeding. More in-depth studies on breastfeeding and work are needed to inform future policy formulation.
- Multi-disciplinary team work: Thought not studied directly by this study, a homogenous team composed mainly of doctors and nurses has limited vision and the product may be not applicable to the wider society. Thus, there is a need to encourage people other then health professionals get involved in breastfeeding promotion. Moreover, projects that work with attention to tradition might be able to break some of the social and cultural blocks that hinder breastfeeding promotion.
- Postpartum community support: Since there is hardly any community breastfeeding support available in Taiwan currently, training of counsellors or peer supporters who can offer practical assistant for breastfeeding women can be important. Further studies are needed to address the implementation of community support of breastfeeding in Taiwan.

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Appendix 1: The hospital interview topics

General information

- The birth story
- Having a new baby. Things which have been easier / harder than expected.

Feeding experience

- First experience immediately after birth
- Is this how they expected?
- Is there anything they expected to happen which didn't?
- Have their views changed over the course of pregnancy / birth?
- Feeding experience in general.
- Engorgement, sore nipples, other difficulties?
- Anyone offers help / practical support?

The role of health professionals

- Have they give information, support, advice.
- Their roles: doctor, nurse, other health professionals.
- Antenatal education.
- Mother support groups.

Advice and information about feeding

- Who have they talked to about feeding? What have they said?
- Who's advice they have taken / not taken?
- Where has their information about infant feeding come from?
- Which source of information has been the most important to you? Who from? Timing? Adequate?

Support

- What help have they had from family, friends, husband; and who will do after discharge?
- What do they wish people to say or do to be helpful or supportive?

Future decisions and suggestions

- Feelings / plans about returning to work
- How work influences decisions about feeding the baby?
- Plan after going back home
- Views about breastfeeding promotion in hospital
- Views about health professionals and how they could be improved.

Appendix 2: The 1-month interview topics

General information

- After discharge and coming back home.
- Having a new baby. Things which have been easier / harder than expected.

Feeding experience

- Have their views changed over the course after discharge?
- General experience / difficulties of feeding so far.
- When would they introduce other foods?
- Weighing – How often, who by, how important.

Advice and information about feeding

- Who have they talked to about feeding? What have they said?
- Who's advice they have taken / not taken?
- Where has their information about infant feeding come from?
- Which source of information has been the most important to you? Who from? Timing? Adequate?

Support

- What help have they had from family, friends, husband or any other people

Future decisions and suggestions

- Feelings / plans about returning to work
- How work influences decisions about feeding the baby?

Appendix 3: The 3-month interview topics

General information

- After 1 month to now.
- Things which have been easier / harder than expected.

Feeding experience

- Have their views changed over the course after 1 month?
- General experience / difficulties of feeding so far.
- When would they introduce other foods?
- Weighing. – How often, who by, how important.

Advice and information about feeding

- Who have they talked to about feeding? What have they said.
- Who's advice they have taken / not taken?
- Where has their information about infant feeding come from?
- Which source of information has been the most important to you? Who from? Timing? Adequate?

Support

- What help have they had from family, friends, husband or any other people

Future decisions and suggestions

- Feelings / plans about returning to work
- How work influences decisions about feeding the baby?

Appendix 4: Survey questionnaires and results of simple percentages

Interview immediate postpartum

General information

Date:

Serial No:

Interviewer:

1 What is your year of birth? e.g. 1965
/__/__/__/__/
(mean: 27.57, SD: 3.85, 20-39y/o) Total : 504 women

2 Have you ever given birth before?
2.1 Yes (40.5%)
2.2 No (59.5%)

3 Including the most recent time, how many times in total have you given birth?
/__/__/ Time(s)
(mean: 1.47, SD: 0.65, 1-4)

4 Your educational level is
4.1 ≤junior high (2.4%)
4.2 ≤senior high (22.6%)
4.3 Institute of technology (35.7%)
4.4 College/ University (34.5%)
4.5 Postgraduate (4.8%)

5 After birth, do you have to go to work?
5.1 Yes (76.2%)
5.2 No (23.8%)

6 Do you live with your husband's family?
6.1 Yes (49.2%)
6.2 No (50.8%)

7 How did you give birth this time?
7.1 Planned CS (29.8%)
7.2 Emergency CS (4.8%)
7.3 Assisted delivery (13.1%)
7.4 Natural birth (52.4%)

8 (For Multiparaous) Did you breastfeed your previous child?
8.1 Yes (20.6%)
8.2 No (79.4%)

9 (If yes for Q8) For how long?
9.1 < 1 month (66.7%)
9.2 1-2 months (16.7%)
9.3 2-3 months (0)
9.4 >3 months (16.2%)
9.5 Cannot remember (0)

Pregnancy

10 Once you became pregnant, who provided the health care for you most directly?

10.1 Doctor (86.3%)

10.2 Midwife (0.8%)

10.3 Nurse (6%)

10.4 Physician's assistant (6.9%)

11 Did you take any antenatal education classes during your pregnancy?

11.1 Yes (39.3%)

11.2 No (60.7%)

12 (If yes),Did you receive any information concerning infant feeding in antenatal classes?

12.1 Yes (98%)

12.2 No (2%)

12.3 No idea (0)

Birth

13 (For Vaginal Birth) During your birth and labour, did someone…?

	Yes (%)	No (%)	Don't remember /know (%)
01.Break your membranes to release amniotic fluid after contractions began	23.6	67.3	9.1
02.Shave your pubic hair	0.3	94.5	5.2
03.Give you enema or laxatives	41.2	50.9	7.9
04.Give you IV fluid through a blood vessel in your arm	90.9	7.3	1.8
05.Give you drug to strengthen or speed up contractions after contractions began	54.8	41.8	3.3
06.Give you one or more vagina exams	94.5	1.8	3.6
07.Give you an episiotomy	91.5	3.6	4.8
08.Stitch you near the opening of your vaginal to repair a tear or cut	91.8	1.8	6.4
09. Caregiver monitor your baby's heartbeat continuously by an electronic fetal monitor	96.7	1.2	2.1

14 (For elective CS, n=*150*) Reasons for having CS? (Multi choice)

14.1 I had previous CS (48%)

14.2 It is less painful (76%)

14.3 Friends' / relatives' recommendation (36%)

14.4 My family wanted me to (68%)

14.5 We can choose the "appropriate timing" so that my baby has better

fortune. (28%)

14.6 Easier to predict and control (72%)

14.7 My baby is too big (24%)

14.8 Baby was not in the right presentation (4%)

14.9 It is safer (60%)

15 *(For those who opt 14.4)* Which of the following member had influence on this decision? (Multiple choice)

15.1 My own mother (31.2%)

15.2 Mother-in-law (70.6%)

15.3 Husband (41.2%)

15.4 Sister (29.4%)

15.5 Others (23.5%)

16 *(For those who have Vaginal Birth, n=354)* Did you have epidural / spinal anaesthesia as a form of your pain relief?

16.1 Yes (37.6%)

16.2 No (62.4%)

16.3 Not sure (0%)

17 *(For those who have Vaginal Birth, n=354)* After you were admitted and your contractions become regular, did you walk around at all?

17.1 Yes (18.2%)

17.2 No (72.7%)

17.3 Not sure (9.1%)

18 *(For those who have Vaginal Birth, n=354)* What was the main position you used while pushing your baby out?

18.1 Lying on my back with legs on stir up (lithotomy) (94.2%)

18.2 Lying on my back (3.6%)

18.3 Lying on my side (0%)

18.4 Upright (0%)

18.5 Hands and knees (0%)

18.6 Others (1.2%)

18.7 Not sure (0.9%)

19 What type of caregiver was the person who primarily delivers your baby?

19.1 Doctor (99%)

19.2 Midwife(0%)

19.3 Nurse (0.4%)

19.4 Physician's assistant (0.6%)

19.5 Not sure (0%)

Postpartum

Early Skin contact

20 During first hour after birth, where was your baby primarily?

20.1 With me (3.6%)

20.2 With my partner (0.6%)

20.3 With the staff (94.6%)

20.4 Not sure (1.2%)

21 *(For those who opt 20.3: baby with the staff)* Was your baby primarily with staff for…?

21.1 Routine newborn care (88.6%)

21.2 Special care (8.9%)

21.3 I don't remember (2.5%)

Room-in

22 After the first hour of birth, where did your baby stay primarily?

22.1 "24-hr room-in" (4.8%)

22.2 Stay with you in the daytime and in the nursery at night(40.7%)

22.3 Stay with you mainly for feeding (26.4%)

22.4 Stay in the nursery most of the time (28.2%)

22.5 Others (0%)

Feeding practice

23 How have you fed your baby within the last 24 hrs?

23.1 Formula only (36.9%)

23.2 Some breastmilk some formula (57.5%)

23.3 Breastmilk only (5.6%)

24 First time you started to consider how to feed your baby was

24.1 Before pregnancy (57.1%)

24.2 Early to mid pregnancy (22.6%)

24.3 Late pregnancy (15.5%)

24.4 After birth (4.8%)

25 Over all, how would you describe the health care you received during birth?

25.1 Very poor (0.4%)

25.2 Poor (0.6%)

25.3 Good (90.7%)

25.4 Very good (0.3%)

Date:

Serial No:

Interviewer:

Interview 3 month PP

Birth

26 Over all, how would you describe the health care you received during birth?

26.1 Very poor (16.7%)

26.2 Poor (34.9%)

26.3 Good (44.2%)

26.4 Very good (4.2%)

27 Do you agree the following statement?

	Agree (%)	Somewhat (%)	Disagree (%)
01. I had reasonable privacy during birth	14.9	15.7	69.4
02. I had reasonable privacy during hospital stay	9.9	33.3	56.7
03. I had most of the procedures clearly explained to me before it is done	16.7	14.3	69.0
04. The staff's overall attitude was to encourage breastfeeding	84.5	31.1	2.4

Infant feeding

28 How do you (and baby's caregiver) feed your baby in the last 24 hrs?

28.1 Formula only (54.4%)

28.2 Mixed feeding (37.1%)

28.3 Breastmilk only (8.5%)

29 (For Mixed and EBF) How do you feed your baby breast milk?

29.1 Almost always directly from the breasts (1.3%)

29.2 Feed from the breasts when I am with the baby, and feed expressed breast milk when we are separate. (21.7%)

29.3 Almost always feed my baby with bottle (77%)

29.4 Others(0%)

30 Reasons of choosing current feeding route.

	Important (%)	Somewhat important (%)	No effect (%)
01. Convenient for me	84.3	15.7	0
02. Convenient for baby's caregiver	82.2	12.6	5.2
03. Possible to measure milk volume	79.1	13.0	7.8
04. Others can feed baby as well	67.0	27.8	5.2

31 Sources of information on infant feeding.

	A major source (%)	A minor source (%)	No (%)
01. Mother-in-law	57.1	34.5	8.3
02. Friends and relatives	47.6	40.5	11.9
03. Health professional	28.6	47.6	23.6
04. Self bought books/ magazines	38.1	38.1	23.8
05. Internet	39.3	33.3	27.4

32 Do following people's attitudes towards infant feeding affect how you feed your baby?

	Important (%)	Not so important (%)	No effect (%)
01. Mother-in-law	40.5	32.1	27.4
02. Husband	37.1	31.2	31.7
03. Friends and relatives	25.8	51.4	22.8
04. Health professional	13.1	53.6	33.3

33 The most recent birth, from discharge to now, have you experienced the following events?

	Not a problem	A minor problem	A major problem
01. Painful perinium	5.5	21.8	72.7
02.Pain at the site of cesarean incision	0	27.6	72.4
03. Backache	15.3	35.9	48.8
04. Breast problems	51.2	28.6	20.2
05. Headaches	49.2	36.5	14.3
06. Physical exhaustion	6.0	48.2	45.8

34 After discharge, do you have the following concerns?

	Never a concern	A minor concern	A major concern
01. Inadequate milk	15.5	25.0	59.5
02. Baby wouldn't suck on the breasts	19	16.7	64.3
03. Colic / unsettled baby	72.6	9.5	17.9
04. Jaundice	50.5	28.6	21.4
05. Baby's weight	40.5	39.3	20.2