

**WESTERN SYDNEY**  
UNIVERSITY



Breastfeeding knowledge and attitudes of baccalaureate nursing students in Taiwan

(The **BONUS** Project)

A thesis submitted in fulfilment of the requirements for Doctor of Philosophy (PhD) degree

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March 2019

## **Acknowledgements**

I wish to express my gratitude to the following people who each provided me support and encouragement to complete my PhD thesis. First, I would like to express sincere gratitude to my primary supervisor Professor Virginia Schmied for her continuous support and guidance from the start, and for her patience, motivation and immense knowledge. Professor Yenna Salamonson has too been very kind in spending additional time to guide me in the analysis of statistical data. I have learned a lot from her research expertise. I would also like to express great appreciation for Dr Elaine Burns for her valuable and constructive suggestions during all phases of the research and for the great questions she always asked me about education and practice in Taiwan. I could not have imagined a better supervisory team.

Completing this work would have been all the more difficult were it not for the support and friendship provided by my colleagues at the Department of Nursing in Taiwan. I also wish to thank all the mothers, nursing students, healthcare staff and nursing teachers who participated in this research. I am indebted to them for their contribution.

Finally, I would like to extend my deepest gratitude to my family and Tuan-I, who encouraged and supported me at every stage. Without their love, support and understanding, I could never have completed this degree.



## **Statement of Authentication**

This thesis is submitted to the Western Sydney University in fulfilment of the requirement of Doctor of Philosophy.

The work presented in this thesis is, to the best of my knowledge and belief, original except as acknowledged in the text. I hereby declare that I have not submitted this material, either in full or in part, for a degree at this or any other institution.

Shu-Fei Yang



March 2019

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## List of Publications

### Peer-reviewed Papers Published

**Yang, S.-F.,** Salamonson, Y., Burns, E., & Schmied, V. (2018). Breastfeeding knowledge and attitudes of health professional students: A systematic review. *International Breastfeeding Journal, 13*(8), 1–11.

doi:10.1186/s13006-018-0153-1 (Impact Factor: 2.475)

**Yang, S.-F.,** Schmied, V., Burns, E., Brodribb, W., & Salamonson, Y. (2018).

Validation of the Chinese version of the Australian Breastfeeding Attitude Questionnaire. *Journal of Human Lactation, 34*(4), 674–681.

doi:10.1177/0890334418761567 (Impact Factor: 2.349)

**Yang, S.-F.,** Schmied, V., Burns, E., & Salamonson, Y. (2019). Breastfeeding knowledge and attitudes of baccalaureate nursing students in Taiwan: A cohort study. *Women and Birth, 32*(3), e334–e340.

doi:10.1016/j.wombi.2018.08.167 (Impact Factor: 2.079)

**Yang, S.-F.,** Burns, E., Salamonson, Y., & Schmied, V. (2019). Expectations and experiences of nursing students in supporting new mothers to breastfeed: A descriptive qualitative study. *Journal of Clinical Nursing, 28*(11-12), 2340–2350. doi:10.1111/jocn.14836 (Impact Factor: 1.757)

## Conference Papers

**Yang, S.-F.,** Salamonson, Y., Burns, E., & Schmied, V. (2016, June 28–29).

*Breastfeeding knowledge and attitudes of baccalaureate nursing students in Taiwan.* Oral presentation at the Research Futures Forum, School of Nursing and Midwifery, Western Sydney University, Sydney. Awarded best junior presentation.

**Yang, S.-F.,** Schmied, V., Burns, E., & Salamonson, Y. (2016, December 1–4).

*Cross-cultural psychometric validation of the Australian Breastfeeding Attitude Questionnaire.* Oral presentation at the 19th Congress of the Federation of Asia and Oceania Perinatal Societies (FAOPS), Taipei, Taiwan.

**Yang, S.-F.,** Salamonson, Y., Burns, E., & Schmied, V. (2017, October 26–27).

*Breastfeeding knowledge and attitudes of baccalaureate nursing students in Taiwan.* Oral presentation at the Research Futures Forum, School of Nursing and Midwifery, Western Sydney University, Sydney.

**Yang, S.-F.,** Schmied, V., Burns, E., & Salamonson, Y. (2018, May 1–4).

*Breastfeeding knowledge, attitudes and confidence of baccalaureate nursing students in Taiwan.* Poster presentation at the 17th National Nurse Education Conference (NNEC), Melbourne.

**Yang, S.-F.,** Salamonson, Y., Burns, E., & Schmied, V. (2018, July 2–3).

*Supporting new mothers to breastfeed in Taiwan: Expectations and experiences of nursing students.* Senior students' three-minute oral presentation at the Research Futures Forum, School of Nursing and Midwifery, Western Sydney University, Sydney.

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## List of Abbreviations

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ABKAQ-SF	The Australian Breastfeeding Knowledge and Attitude Questionnaire (Short Form)
ABAQ	Australian Breastfeeding Attitude Questionnaire (The attitude component of the ABKAQ-SF)
ABAQ12	The revised 12-item Australian Breastfeeding Attitude Questionnaire
BFHI	Baby Friendly Health Initiative
BN	Baccalaureate of Nursing
CASP	Critical Appraisal Skills Programme
CUMT	Chung Hwa University of Medical Technology
NHI	National Health Insurance
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
SPSS	Statistical Package for the Social Science
TNAC	Taiwan Nursing Accreditation Council
UNICEF	United Nations Children's Fund
WHO	World Health Organization

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## Abstract

**Background:** Optimal nutrition during the first year of life is critical to an infant's healthy growth and development. Hence, it is vital that undergraduate health professional curricula provide opportunities for quality theoretical and clinical learning related to breastfeeding to enable students to acquire the necessary knowledge and skills to support breastfeeding mothers. There is evidence that theoretical and clinical education can improve such knowledge bases and attitudes among nursing students prior to clinical placement.

**Aims:** The aim of this research project was to examine, in relation to breastfeeding, the effects of the theoretical and clinical learning experiences of Taiwanese nursing students' knowledge and attitudes. This research project also explored the role and experiences of nursing students in supporting breastfeeding from the perspectives of the students themselves, new mothers, nursing staff and teachers.

**Methodology:** A mixed-methods design was used and involved both quantitative and qualitative data collection and analysis. First, a systematic review reporting on outcomes for nursing students was conducted. Accordingly, the Australian Breastfeeding Knowledge and Attitude Questionnaire (Short-Form) (ABKAQ-SF) was selected as an appropriate tool to examine the current knowledge and attitudes of Taiwanese nursing students. This questionnaire was further validated in Chinese, the approach to which is presented in Paper 2. Second, quantitative data were collected using a pre- and post-test survey design with two cohorts of nursing students. Knowledge and attitude were assessed before and after students' theoretical learning and clinical placement. Third, qualitative data were collected by conducting focus groups and small group interviews with four participant groups. Ethics approval was obtained prior to data collection.

**Findings:** The findings of this research project are presented in four published papers. The systematic review of the literature indicated that health professional students demonstrated mid-range scores on breastfeeding attitudes, and their knowledge of breastfeeding was limited. The review also highlights the need to determine how breastfeeding knowledge and skills are best facilitated in undergraduate curricula to help students relate theoretical breastfeeding knowledge to practice (Paper 1). The results of the study determined the effect of breastfeeding education in a Baccalaureate of Nursing (BN) program on students' knowledge and attitude towards breastfeeding. Students demonstrated significant improvements in both areas following theoretical and clinical intervention (Paper 3). The final paper explored the experiences of nursing students in supporting breastfeeding mothers in a postpartum unit. Students highlighted the importance of establishing trust to effectively support mothers and a need to feel confident to provide breastfeeding information, in turn. The study also identified nursing students' need for further support, to develop effective communication skills and to build confidence prior to clinical placement.

**Conclusion:** Results revealed that the current breastfeeding education program in Taiwan, both its theoretical and clinical components, increased nursing students' knowledge and improved positive attitudes towards breastfeeding. Any sociodemographic differences in knowledge and attitude about breastfeeding were ameliorated following theoretical and clinical learning. The findings also demonstrated the need for further support in developing effective communication skills and building confidence prior to clinical placement.

# Chapter 1: Introduction

## 1.1 Overview

To promote the health and optimal growth of infants and children, both the World Health Organization (WHO, 2009) and the United Nations Children's Fund (UNICEF) recommend that infants should be exclusively breastfed for the first six months of their life. Currently, the rates of exclusive breastfeeding in Taiwan are high, with exclusive breastfeeding at 83.7%, 66.2% and 61.2%, respectively, during hospitalisation and at one and two months postpartum (Health Promotion Administration, 2017c; Waits, Guo & Chien, 2018). Although the rate of exclusive breastfeeding among Taiwanese women during the early postpartum period is high, to maintain this rate up to six months it is essential that health professionals and students have a positive attitude towards breastfeeding, as well as sufficient knowledge and skills to guide and assist breastfeeding women. As such, this thesis addresses this concern by exploring Taiwanese nursing students' knowledge, attitudes and their experiences in supporting breastfeeding during their undergraduate nursing studies.

This thesis is presented as four interrelated papers. These include a systematic review of the literature, a paper reporting the cross-cultural psychometric validation of the Chinese version of the Australian Breastfeeding Attitude Questionnaire (ABAQ), a third paper examining the change in nursing students' knowledge and attitude on breastfeeding during specific stages of their undergraduate nursing education, and a fourth paper exploring the experiences of nursing students when supporting breastfeeding women in clinical settings.

First, Chapter 1 presents the background and rationale for the study, the study aims and method, the researcher's story and the thesis structure. It outlines the importance of breastfeeding and its benefits, and provides an overview of the strategies that have been implemented globally and in Taiwan to increase breastfeeding rates. This is followed by the background and context of the study, an overview of the study site in Taiwan and the breastfeeding program nursing students receive in their undergraduate studies.

## **1.2 Background**

### **1.2.1 Breastfeeding Globally and in Taiwan**

Optimal nutrition during the first year of life is critical to infants' healthy growth and development. Hence, it is not surprising that both WHO and UNICEF (2018) recommended that breastfeeding should be initiated within the first hour after birth, continued exclusively for the first six months of life and sustained with the introduction of appropriate complementary foods for two years or more. The American Academy of Pediatrics (2005) in a policy statement further noted that breastfeeding is the ideal form of infant nutrition, as it provides health benefits for both mothers and infants (Victora et al., 2016). A newborn that is not exclusively breastfed could be at a substantially greater risk of infectious disease such as diarrhoea and respiratory tract infections than one who is breastfed (UNICEF, 2018). Breastmilk also contains nutrients that actively stimulate the infant immune system, and is positively associated with brain development to improve performance in childhood intelligence testing (Isaacs et al., 2010; Lodge et al., 2015). For women, breastfeeding for more than 12 months offers protection against certain types of cancer, such as breast and ovarian carcinoma (Chowdhury et al., 2015).

Breastfeeding has important global public health effects. In an effort to increase rates of breastfeeding, both WHO and UNICEF prepared a number of global policy statements and infant feeding guidelines. In 1991, the organisations launched the Baby Friendly Health Initiative (BFHI) and the Ten Steps to Successful Breastfeeding to improve the initiation and continuation of breastfeeding (WHO & UNICEF, 2009). Internationally, hospitals and community services have sought accreditation as baby-friendly health services. Accordingly, the BFHI focuses on providing optimal clinical care for new mothers and their infants in facilities (WHO & UNICEF, 2018).

Recent reviews indicate that adherence to the Ten Steps significantly improves breastfeeding rates (McFadden et al., 2017; Pérez-Escamilla, Martinez & Segura-Pérez, 2016). In 2011, more than 20,000 facilities in 150 countries providing maternity and newborn services around the world have been accredited and have achieved baby-friendly status (Baby Friendly USA, 2018; Labbok, 2012). Overall, coverage of the BFHI in 168 countries is estimated to be 10% as of 2016; however, this percentage varies widely by region, with a coverage rate of 36% across Europe but less than 5% in Africa and South-East Asia (WHO, 2017). WHO and UNICEF (2018) recently released revised versions of the BFHI and Ten Steps in 2018, the latter of which was divided into critical management procedures (Steps 1 and 2) and key clinical practices (Steps 3–10) to support breastfeeding (see Table 1.1). Globally, 42% of newborns initiate breastfeeding within the first hour after birth, and the prevalence of exclusively breastfed infants was 40% for the first six months (UNICEF, 2018).

Table 1.1:

Ten Steps to Successful Breastfeeding

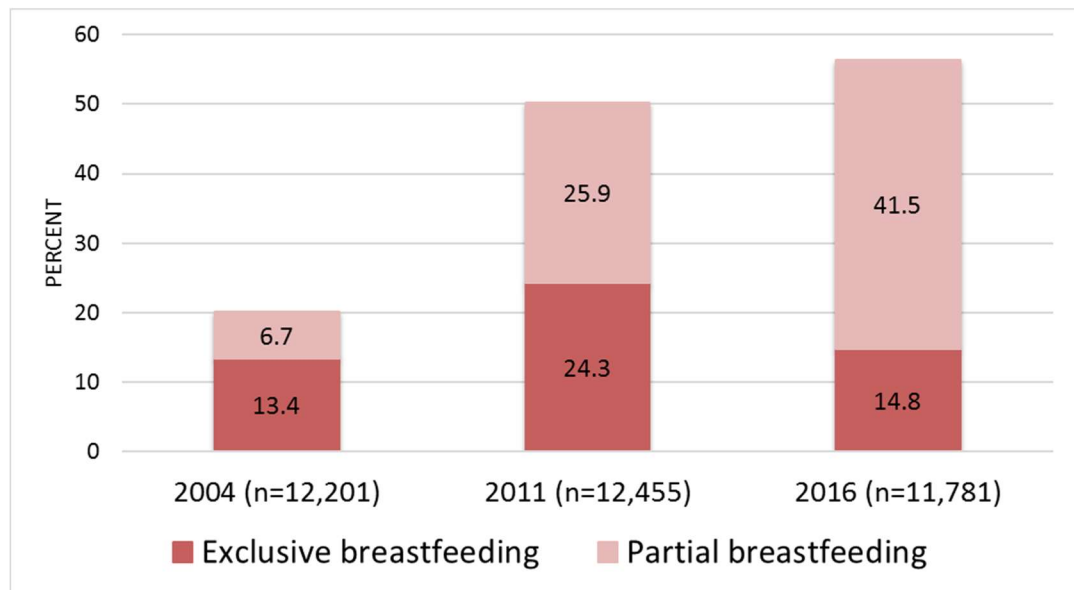
Critical management procedures	
1. a.	Comply fully with the International Code of Marketing of Breast-milk Substitutes and relevant World Health Assembly resolutions.
b.	Have a written infant feeding policy that is routinely communicated to staff and parents.
c.	Establish ongoing monitoring and data-management systems.
2.	Ensure that staff have sufficient knowledge, competence and skills to support breastfeeding.
Key clinical practices	
3.	Discuss the importance and management of breastfeeding with pregnant women and their families.
4.	Facilitate immediate and uninterrupted skin-to-skin contact and support mothers to initiate breastfeeding as soon as possible after birth.
5.	Support mothers to initiate and maintain breastfeeding and manage common difficulties.
6.	Do not provide breastfed newborns any food or fluids other than breast milk, unless medically indicated.
7.	Enable mothers and their infants to remain together and to practise rooming-in 24 hours a day.
8.	Support mothers to recognize and respond to their infants' cues for feeding.
9.	Counsel mothers on the use and risks of feeding bottles, teats and pacifiers.
10.	Coordinate discharge so that parents and their infants have timely access to ongoing support and care.

Source: (WHO & UNICEF, 2018)

In 2004, 39% of medical care institutions in Taiwan were certified as baby-friendly hospitals. By the end of 2018, the national coverage of these facilities nationwide reached 80% (Health Promotion Administration, 2018d, 2019). With this concerted effort from the Taiwanese health services to promote and support breastfeeding, more babies were born in accredited baby-friendly hospitals in 2017 (78.1%) than in 2004 (39.2%) (Health Promotion Administration, 2018d). In the study reported in this thesis, infants classified as fed by exclusive breastfeeding if they were fed with human milk only, with no use of formula, solids, or other liquids. Infants were classified as fed by partial breastfeeding if there was any use of formula, solids, or other liquids in addition to human milk (Lee, Chiou, Chen & Chien, 2015, p. 243). In turn, the rate of exclusive breastfeeding at six months postpartum in Taiwan increased from 13.4% in 2004 to 24.3% in 2011, meaning that both the rates of partial and any breastfeeding (i.e., exclusive breastfeeding) at six months postpartum generally increased from 2004 to 2016 (Chiou, Chen, Yeh, Wu & Chien, 2014; Lee, Chiou, Chen & Chien, 2015; Waits et al., 2018).

The initiation of breastfeeding among Taiwanese women during the early postpartum period is high, with exclusive breastfeeding rates at 83.7%, 66.2% and 61.2%, respectively, at hospitalisation and at one month and two months postpartum (Chuang et al., 2010; Health Promotion Administration, 2018c). However, recent rates have revealed a significant drop in exclusive breastfeeding to 14.8% at six months post-delivery (see Figure 1.1) (Chiou et al., 2014; Lee et al., 2015; Waits et al., 2018).





*Figure 1.1. Breastfeeding rates at six months postpartum in Taiwan (2004, 2011, 2016).*

It is unclear why the rate of exclusive breastfeeding has decreased but this may be primarily related to women returning to paid work as early as eight weeks postpartum—which further coincides with Taiwan’s policy of eight weeks’ paid maternity leave (Chuang et al., 2010; Feng & Han, 2010). It may also correlate to changing practices in maternity units related to the BFHI. For example, a national survey spanning the period between 2011 and 2016 reported a growing number of births at certified baby-friendly hospitals, but a decline in early skin-to-skin contact and rooming-in (Waits et al., 2018). Indeed, both factors during hospitalisation were associated with continued, exclusive and any breastfeeding at six months postpartum (Chiou et al., 2014).

To ensure that mothers receive accurate information, support and encouragement for breastfeeding while in hospital and in the community, a number of initiatives in other countries have focused on educating health professionals to extend the duration of the practice (Brodribb, Fallon, Jackson & Hegney, 2008b; Darwent & Kempenaar, 2014). The emphasis on health professional education is

core to the global strategy on infant feeding. This is further reflected in the second step of the Ten Steps to Successful Breastfeeding, which ensures that healthcare staff members have ‘sufficient knowledge, competence and skills’ (WHO & UNICEF, 2018, p. 42), and receive at least a 20-hour course on breastfeeding, including the knowledge and skills to support women to breastfeed.

### **1.2.2 Taiwan and the Health of the Population**

Taiwan is an island located in East Asia. It has a total land area of about 36,000 square kilometres and a total population of approximately 23.7 million in 2018 (Health Promotion Administration, 2018a). In Taiwan, Mandarin is the official language and the Taiwanese constitution guarantees freedom of religion. Government statistics show that Buddhism is the most popular religion, followed closely by Taoism (Executive Yuan, 2015).

Over 99% of nationals in Taiwan are covered by a National Health Insurance (NHI, 2015) system, which was established in 1995 and provides comprehensive, uniform and high-quality treatment nationwide. According to the Health Promotion Administration (2018b), the birthrate in 2017 was 8.23% per 1,000 people, in contrast to year 2000, when the rate was at 14.2%. This low birthrate is a reflection of women’s choices, coupled with higher levels of education, a trend to marry later and the use of infertility services (Chien, Lee, Lin & Tai, 2015; Health Promotion Administration, 2018b). Between 2007 and 2017, the mean maternal age of women having their first child increased from 28.5 years to 30.8 years, and the proportion of primiparous women aged 35 years or older increased from 7.8% to 21.3% (Ministry of the Interior Department of Statistics, 2018).

Employees in Taiwan are protected by different social insurance programs according to their occupation. Although the details of maternity leave in each social

insurance program vary, all mothers in Taiwan are generally entitled to approximately eight weeks of fully paid maternity leave (Lai & Masters, 2005). Most families in Taiwan require a double income to maintain their standard of living, so the timing of mothers' return to work coincides with the duration of paid maternity leave (Feng & Han, 2010). The length of maternity leave has been shown to positively associate with the duration of breastfeeding, and parental leave policies can affect the incidence of breastfeeding (Puhani & Sonderhof, 2011).

### **1.2.3 Maternity Care in Taiwan**

In Taiwan, preventive healthcare services are provided and all women are eligible for 10 free prenatal examinations. Women have access to a number of subsidised prenatal genetic screening and diagnoses, baby-friendly accredited hospitals and universal infant screening to keep newborns healthy (Executive Yuan, 2015). Although other options are available, most pregnant women opt for an obstetrician to provide maternity care and plan to give birth in hospital (Chuang et al., 2010). For example, in 2017 a total of 99.85% of pregnant women chose obstetricians as their maternity care provider and consequently gave birth in hospital, while only 0.07% of babies were born with midwives' assistance (Health Promotion Administration, 2018b). Nevertheless, both medical and nursing staff have the shared responsibility to support mothers to breastfeed, as required under the breastfeeding policy in Taiwan (Chuang et al., 2010). Although there are midwifery programs and some certified lactation consultants in the country, to date there are very few midwives trained and employed to deliver these specialised needs in Taiwan. It is the obstetricians and registered nurses who are the principal healthcare professionals in providing antenatal, labour, delivery and postpartum care to women and newborns (Chuang et al., 2010; Health Promotion Administration, 2018b).

Of the total births in 2016 in Taiwan, less than two-thirds were normal spontaneous births, with the remaining births by caesarean section (Health Promotion Administration, 2018a). Typically, women stay in hospital for three days after vaginal birth and five days after caesarean (NHI, 2015). In an effort to restore balance in health, prevent future illness, prepare for any future pregnancy and facilitate the transition into motherhood, postpartum women participate in a traditional ancient practice called ‘doing the month’. The time recommended for this period of convalescence is one month to six weeks immediately after delivery (Liu, Petrini & Maloni, 2015; Yeh, St John, Chuang & Huang, 2017). When discharged from maternity care, more than half of new mothers, together with their babies, opt to stay at a postpartum nursing centre, also known nationally as a ‘doing the month’ centre (Health Promotion Administration, 2018b). These postpartum facilities combine traditional and cultural postnatal practices with modern medical expertise to provide 24-hour care for mothers and infants, while also allowing women to be accompanied by family and friends (Chien, Tai, Ko, Huang & Sheu, 2006; Hung, Yu, Ou & Liang, 2010). The cost of staying in a postpartum nursing centre varies from NT\$3,000 to NT\$15,000 (approximately AUD\$130–650) each day. Despite the fact that the cost is high and admission is not covered by Taiwan’s NHI system, the availability of rooms in these postpartum nursing centres is still limited and appears to be in short supply. In fact, some mothers have to return home for ‘the month’ while they remain on a waiting list pending access (Yeh, St John & Venturato, 2016).

#### **1.2.4 Nursing Education in Taiwan**

The Baccalaureate of Nursing (BN) program in Taiwan takes four years to complete. In 2016, there were 14,696 graduates from nursing schools across the nation, 1,151 (7.8%) of which were male (Ministry of Education, 2018). Upon

graduation, nursing students are eligible to take the national exam to secure licensure as a registered nurse; thereafter, they can elect to work in a maternity unit.

Accordingly, the Ministry of Examination in Taiwan offers national registered nurse-licensing examination, which is comprehensive in scope and covers subjects in basic medicine, pathophysiology, pharmacology, medical–surgical nursing, paediatric nursing, maternal and child nursing, and psychosocial nursing. With a pass rate as low as 39%, only 8,118 graduates in 2017 passed the registered nurse exam (Ministry of Examination, 2018). In the Department of Nursing at Chung Hwa University of Medical Technology (CUMT) (where this research was conducted), this rate was comparatively higher at 79.8% in 2017, which starkly contrasts the Ministry’s low ratio of success. Further, there are only two midwifery programs available in Taiwan. Established in 1999 and 2000 at two separate universities, one is a two-year technical baccalaureate program and the other is a master’s degree program (Wu, 2017). Graduands of these programs are eligible to take the national examination to secure licensure as a registered midwife. In 2017, a total of 24 graduates passed the registered midwife national examination, the license pass rate of which remains at 50% (Ministry of Examination, 2018).

Accounting for the need to professionalise nursing education, the Ministry of Education established in May 2006 the Taiwan Nursing Accreditation Council (TNAC). TNAC specifies eight core competencies as a standard for BN curriculum development, and these inform the approach and strategies for teaching and learning. Competencies include critical thinking and reasoning, general clinical skills, basic biomedical science, communication and teamwork capability, caring, ethics, accountability and lifelong learning (Fan, Wang, Chao, Jane & Hsu, 2015; Lee, Wei & Wang, 2013). Further, all nursing curricula include a subject of study on maternal

and child nursing. Knowledge and skills related to breastfeeding are included therein and comprise of theoretical content of between three and eight hours in total length (Australian College of Midwives, 2016; WHO & UNICEF, 2009).

In the Department of Nursing at CUMT, a breastfeeding module is included in the Maternal and Child Nursing subject taught in the second year of a four-year curriculum. This module consists of three hours of face-to-face theoretical content and six hours of laboratory-based skills learning on breastfeeding. In the fourth year of the program, a four-week clinical practicum is required.

#### ***1.2.4.1 Pedagogical Approach to the Maternal and Child Nursing Component***

The three-hour face-to-face Maternal and Child Nursing theoretical content is presented in a didactic lecture style. Content includes information on hospital policies and procedures, factors that affect breastfeeding, initiation and continuation, physiology of lactation, benefits of breastfeeding for mothers and infants, management of common problems with breastfeeding, and breastfeeding support. Audiovisual and written materials are also used, including videos of breastfeeding latch and a lecture using PowerPoint presentation software. Students also have access to a textbook that presents evidence-based information about breastfeeding promotion.

The six-hour breastfeeding laboratory-based skills learning component includes techniques for expressing breastmilk, assessment of the breast, strategies for breastmilk storage and breastfeeding positions. At the beginning of each lab-based skill, nursing students are shown an audio-visual recording of the technique being discussed. Teachers then demonstrate the breastfeeding skills and subsequently evaluate students' practical skills and ability to educate breastfeeding mothers with a skills assessment sheet.

In fourth year (the last year of baccalaureate-level nursing education), nursing students provide maternity care for childbearing women in a four-week Maternal and Child Nursing clinical placement. There are two days of orientation provided by the clinical educator at the beginning of placement, after which students spend one week in the postnatal unit and have the opportunity to support mothers with breastfeeding. They gain experience in breastfeeding support and management of maternal issues such as insufficient breastmilk supply, mastitis and return to work. The specific content of curriculum related to breastfeeding is presented in Table 1.2.

Table 1.2:

## Curriculum Related to Breastfeeding in Taiwan's Four-year BN Program

Type	Year	Curriculum related to breastfeeding	Content
Theoretical education	1	—	Fundamental nursing courses
	2	Didactic (three hours)	<ul style="list-style-type: none"> <li>• BFHI policies and procedures</li> <li>• Factors that affect breastfeeding</li> <li>• Breastfeeding initiation and continuation</li> <li>• Physiology of lactation</li> <li>• Benefits of breastfeeding for mother and infant</li> <li>• Management of common problems with breastfeeding</li> </ul>
		Laboratory-based skills (six hours)	<ul style="list-style-type: none"> <li>• Assessment of the breast</li> <li>• Techniques for expressing human milk by hand or pump</li> <li>• Strategies for human milk storage</li> <li>• Breastfeeding latch on</li> <li>• Positions for breastfeeding</li> </ul>
	3	—	Other advanced nursing courses
Clinical placement	4	One week (40 hours) in a postnatal unit	<ul style="list-style-type: none"> <li>• Two days of orientation</li> <li>• Breastfeeding support</li> <li>• Group education for mothers</li> <li>• Management of maternal issues</li> <li>• Discharge planning</li> </ul>

### 1.3 Rationale for the Study

From the breastfeeding data presented in Section 1.2, it is evident that while the overall proportion of babies being breastfed is increasing in Taiwan, the duration of exclusive breastfeeding is decreasing. Infants who are breastfed exclusively for six months experience less morbidity from gastrointestinal infection than those who are mixed breastfed as of three or four months of age (Kramer & Kakuma, 2012). One strategy to address this is to ensure that women are well supported and receive adequate education related to breastfeeding in the immediate postnatal period, as



well as support to continue breastfeeding when returning to paid work. To ensure that future health professionals, particularly nursing students, are well prepared to support breastfeeding there is a responsibility for undergraduate nursing curricula to adequately equip students with the essential knowledge and skills training during their nursing studies. Therefore, it is important that nursing students in Taiwan receive effective breastfeeding instruction and experience to become competent practitioners. Primarily, this ensures that future nurses can provide accurate and realistic breastfeeding information to mothers, and, most importantly, support them to continue breastfeeding when they return to work approximately eight weeks after birth. With the limited number of hours in theoretical and skills training at university, it is possible that students are unprepared for this aspect of practice, which, anecdotally, has been observed by myself, my colleagues and by wider clinical staff. Hence, reforms in nursing education are needed to improve the learning experiences of nursing students to better prepare them for professional practice. To date, no study has examined the knowledge and attitudes towards breastfeeding in BN students or the perspectives of nursing teachers, clinical staff and new mothers on the understanding and skills required by students in Taiwan. This research is required to inform both the development of an effective breastfeeding education program for nursing students and the most effective teaching strategy that can positively influence students' knowledge and attitudes towards breastfeeding.

## **1.4 Study Aims**

This research project had two primary aims:

1. Examine the effects of theoretical and clinical learning experience on Taiwanese nursing students' knowledge and attitude towards breastfeeding.
2. Explore the role and experiences of nursing students in supporting breastfeeding from the perspectives of the students themselves, new mothers, nursing staff and teachers.

## **1.5 Study Method**

A mixed-methods design was selected as the most appropriate way to address the two study aims. Study 1 used a pre- and post-test design with two nursing student cohorts to determine their breastfeeding knowledge and attitudes before and after theoretical and lab-based skills learning (second- and third-year student group), and before and after clinical placement (third- and fourth-year student group). Study 2 was a qualitative study comprising focus group meetings and small group interviews. This aimed to explore the role and experiences of nursing students in supporting breastfeeding from the perspectives of students themselves, new mothers, nursing staff and teachers.

## **1.6 The Researcher's Story**

I have been a registered nurse with the Taiwan Nurses Association since 1998 and have worked in the area of maternal and child care at a local hospital. I acquired considerable experience providing care to childbearing women, newborns and their families, and teaches maternal and child care at university and in the community. My academic journey began as a lecturer since 2002 in the Department of Nursing at CUMT in Taiwan, where the nursing students and teaching staff were recruited in the

research project. It has been a positive and rewarding experience to guide students as they learn about maternal and child nursing in classrooms, laboratories and during clinical placement.

As an educator, supervising students on clinical placement allowed me to observe that some appeared uncertain and felt anxious supporting women in the postnatal unit, especially in the early stage of placement. Before proposing any curricular changes, it is important to understand students' attitudes towards breastfeeding and their knowledge on supporting its initiation and maintenance. Indeed, facilitating students' confidence is also an important component of clinical placement. More than 10 years of teaching experience has convinced me that I needed to contribute by making improvements in the overall breastfeeding component in Taiwan's nursing curriculum. Hence, my desire to explore whether current curricula were adequately preparing students to support breastfeeding mothers led me to embark upon this research journey as an international PhD candidate in the School of Nursing and Midwifery at the Western Sydney University in Sydney, Australia.

## **1.7 Thesis Structure**

This thesis is presented as a series of publications comprised of four interrelated papers that have either been accepted (one paper) or published (three papers) in peer-reviewed journals (see List of Publications). Each of the published papers is presented as a chapter in the thesis, with a brief summary highlighting their respective relevance herein.

Chapter 1 outlines the importance of breastfeeding as well as the benefits and overview of the strategies that have been implemented globally and in Taiwan to increase breastfeeding rates. This is followed by the background and context of the

study, an overview of the study site in Taiwan and the breastfeeding education program nursing students receive in their undergraduate studies. The rationale for this study is also included.

Chapter 2 presents the first paper in the series of publications. Essentially, Paper 1 reports the findings of a systematic review of the literature regarding the knowledge, attitudes or experiences of nursing students and other healthcare professionals relative to breastfeeding.

Chapter 3 next presents an overview and rationale for the methodological approach to this study. This chapter outlines the mixed-methods design used in the thesis and details the participants, approaches to data collection, and analysis and data integration. Chapter 4 next presents the second published paper (Paper 2), which examines the cross-cultural psychometric validation of the Chinese version of ABAQ.

The following two chapters provide the results of this mixed-methods research project. First, Chapter 5 reports the quantitative results, which examine the influence of breastfeeding education on nursing students' knowledge and attitudes towards breastfeeding; these are presented in the third published paper (Paper 3). Next, Chapter 6 provides the qualitative findings on the experiences of nursing students in supporting breastfeeding; these are presented as the fourth paper (Paper 4) in the series.

Finally, Chapter 7 discusses the findings of the study and examines their implications for nursing education in relation to breastfeeding. Transformative learning theory is used to critique the current curriculum for breastfeeding and make recommendations for curriculum redesign. Important issues regarding breastfeeding support for Taiwanese women are also discussed, as changing sociodemographics

continue to affect the practice. The chapter concludes with an outline of the strengths and limitations of the study, and recommendations for future research.

# **Chapter 2: Breastfeeding Knowledge and Attitudes of Health Professional Students: A Systematic Review**

## **2.1 Publication (Paper 1)**

Yang, S.-F., Salamonson, Y., Burns, E., & Schmied, V. (2018). Breastfeeding knowledge and attitudes of health professional students: A systematic review. *International Breastfeeding Journal*, 13(8): 1–11.  
doi:10.1186/s13006-018-0153-1 (Impact Factor: 2.475)

## **2.2 Relevance to the Thesis**

The first paper in the series of publications is a systematic review of the literature. Paper 1 outlines the findings of 14 studies that have either assessed nursing students' and other health professional students' knowledge and attitudes towards breastfeeding or investigated their confidence in supporting women to breastfeed. Papers reporting on the experience and perceptions of midwifery students were excluded because midwifery students spend extensive periods of time in clinical placement where they can learn about breastfeeding in contrast to nursing, and other health professional students.

Based on this review, it appears that nursing students can benefit from targeted programs to increase breastfeeding knowledge, attitudes and confidence to support women and their babies. This paper also highlights the need to determine how breastfeeding knowledge and skills are best facilitated in undergraduate curricula to help students relate theoretical breastfeeding knowledge to practice.

## 2.3 Paper 1

Yang et al. *International Breastfeeding Journal* (2018) 13:8  
<https://doi.org/10.1186/s13006-018-0153-1>

International Breastfeeding  
Journal

REVIEW

Open Access

# Breastfeeding knowledge and attitudes of health professional students: a systematic review



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### Abstract

**Background:** Breastfeeding support from health professionals can be effective in influencing a mother's decision to initiate and maintain breastfeeding. However, health professionals, including nursing students, do not always receive adequate breastfeeding education during their foundational education programme to effectively help mothers. In this paper, we report on a systematic review of the literature that aimed to describe nursing and other health professional students' knowledge and attitudes towards breastfeeding, and examine educational interventions designed to increase breastfeeding knowledge and attitudes amongst health professional students.

**Methods:** A systematic review of peer reviewed literature was performed. The search for literature was conducted utilising six electronic databases, CINAHL, MEDLINE, ProQuest, PubMed, Scopus, and Cochrane, for studies published in English from January 2000 to March 2017. Studies focused on nursing students' or other health professional students' knowledge, attitudes or experiences related to breastfeeding. Intervention studies to improve knowledge and attitudes, were also included. All papers were reviewed using the relevant Critical Appraisal Skills Programme (CASP) checklist.

**Results:** Fourteen studies were included in the review. This review indicates that in some settings, health professional students demonstrated mid-range scores on breastfeeding attitudes, and their knowledge of breastfeeding was limited, particularly in relation to breastfeeding assessment and management. All of the studies that tested a specialised breastfeeding education programme, appeared to increase nursing students' knowledge overall or aspects of their knowledge related to breastfeeding. Several factors were found to influence breastfeeding knowledge and attitudes, including timing of maternal and child health curriculum component, previous personal breastfeeding experience, gender, cultural practices and government legislation.

**Conclusions:** Based on this review, it appears that nursing curriculum, or specialised programmes that emphasise the importance of breastfeeding initiation, can improve breastfeeding knowledge and attitudes and students' confidence in helping and guiding breastfeeding mothers.

**Keywords:** Breastfeeding, Breastfeeding knowledge, Breastfeeding attitudes, Nursing students, Health professional students, Literature review

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## Background

To achieve the health and optimal growth of infants, the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) recommends that all infants should be exclusively breastfed for the first 6 months and continue to receive breast milk until 2 years of age to supplement other foods [1]. In addition, the policy statement of American Academy of Paediatrics cites breastfeeding as the ideal form of infant nutrition, providing health benefits for both mothers and infants [2].

There are a range of factors known to influence a mother's decision to initiate and maintain breastfeeding including the practical, emotional support, and encouragement from health professionals [3]. A Cochrane Review reported that breastfeeding support from health professionals can be effective in extending the duration of breastfeeding [4]. It is therefore important that nursing students and other students in other health professions, acquire knowledge about breastfeeding, and develop skills to support and provide appropriate care to pregnant women, and to mothers with infants, in order to support mothers to breastfeed [5]. However, health professionals, including nursing students, do not always receive adequate breastfeeding education during their foundational education programme to effectively help mothers [6, 7]. There have been two reviews of breastfeeding educational interventions to build capacity in health professionals [8, 9]. Spiby et al. [8] identified a range of educational interventions for healthcare professionals aiming to increase knowledge and support breastfeeding, however due to methodological limitations, they were not able to support any specific approach. Watkins and Dodgson [9] found that educational interventions that mostly focused on increasing women's knowledge about breastfeeding, and how to best support breastfeeding, may be effective in modifying maternal behaviour and healthcare providers' understanding. To date there have been no reviews of interventions to increase the capacity of nursing or other health professional students to support breastfeeding mothers.

In this paper, we report on a systematic review of the literature that aimed to: 1. describe nursing and other health professional students' knowledge and attitudes towards breastfeeding, and report their confidence in supporting women to breastfeed and 2. examine educational interventions designed to increase breastfeeding knowledge and attitudes amongst health professional students. The review addressed two questions: 1. What is the knowledge, attitudes and confidence of nursing students and other health professional students related to breastfeeding? and 2. Do educational interventions in addition to the standard curriculum, better prepare nursing students and other health professional students to support breastfeeding?

## Methods

### Search strategies

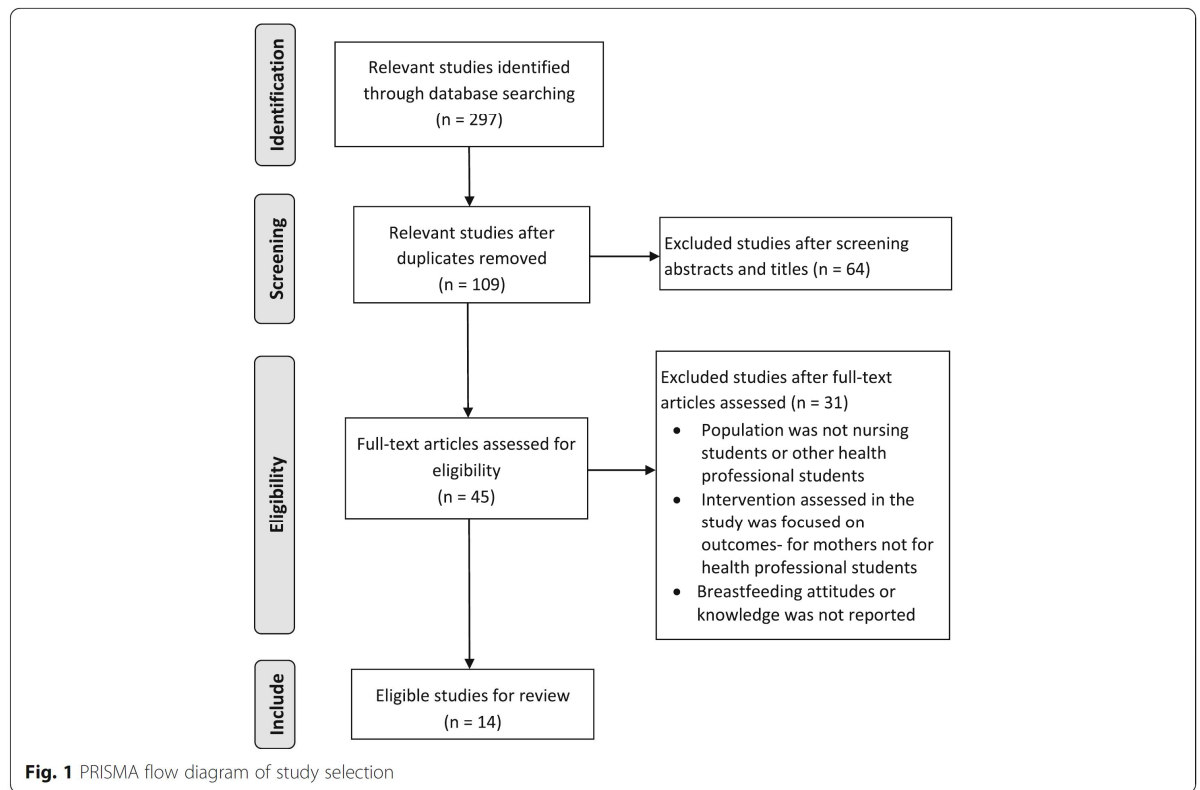
The search for literature was conducted utilising six electronic databases, CINAHL, MEDLINE, ProQuest, PubMed, Scopus, and Cochrane, for studies published in English from January 2000 to March 2017. As nursing curricula change over time, and to select recent publications, the year 2000 was chosen as the start date for the search. The following Medical Subject Headings (MESH) were used in combination: breastfeeding, nursing students, student nurses, medical students and health professional students. Only papers that had examined nursing students' or other health professional students' knowledge, attitudes or experiences related to breastfeeding were included. Intervention studies to improve knowledge and attitudes were also included.

Two frameworks were used in determining the inclusion criteria for this review. For non-intervention studies, the PEO (Person; Exposure; Outcome) framework was used: the person was defined as nursing and health professional students; the exposure was the current undergraduate educational programmes related to breastfeeding; the outcomes were defined as knowledge, attitudes or confidence towards breastfeeding. The PICO (Person; Intervention; Control; Outcome) framework was used for intervention studies [10]. Here the nursing and health professional students were the person, the intervention was the 'add-on' or specialised breastfeeding educational programme, the control sought to include other nursing and health professional students, and the outcome was breastfeeding knowledge, attitudes or confidence.

### Selection process

A total of 297 papers were exported to the EndNote database, of these 109 were duplicates leaving 188 papers. The titles and abstracts were screened for relevance and a further 64 were removed. 45 papers were read in full and 31 were excluded because: the population was not health professional students; the intervention assessed in the study focused on outcomes for mothers and was not related to health professional student education; or breastfeeding attitudes or knowledge were not reported. One quasi-experimental study reported the findings for nursing students, but the results for the nursing students could not be distinguished from other participants and this paper was therefore excluded. One of the studies focused on midwifery students, it was determined that midwifery students spend extensive periods of time in clinical placement where they can learn about breastfeeding in contrast to nursing, and other health professional students, therefore this study was ultimately excluded. The selection process of the included papers is displayed in Fig. 1.





**Quality appraisal of studies**

Fourteen papers met the inclusion criteria and were critiqued using the Critical Appraisal Skills Programme (CASP) tools to evaluate the quality of each study. Two CASP checklists were used, the qualitative research checklist consisted of 10 questions and the cohort study checklist consisted of 12 questions. Qualitative papers may achieve a total score of 10 points [11]. There were 12 questions in the cohort study checklist, with two questions scoring up to 2 points for a total of 14 points when all criteria were met [12]. Two authors read each paper and all authors discussed the scores assigned to each paper. We noted a number of study limitations including sample size and methodological issues and these are discussed in the limitations section. No studies were excluded on quality appraisal. The results of CASP scores can be found in Table 1.

**Results**

**Characteristics of the included studies**

Studies included in this review were conducted in seven countries: United States of America (USA), Australia, Hong Kong, Sweden, India, Egypt and Saudi Arabia. The studies included nursing students, medical students and general practice registrars. See Table 1 for summary of the characteristics of the included studies.

Study designs varied: seven were cross-sectional surveys and one was a mixed-methods study that assessed nursing students’ knowledge and or attitudes towards breastfeeding [13]. Two were qualitative studies that explored nursing students’ attitudes and beliefs about breastfeeding [14, 15] and their perspectives on promoting successful breastfeeding [15]. Three studies reported the validity and reliability of the instruments used [16–18]. Some of these studies collected data before and/or after standard theory and laboratory based learning in maternal and child health curriculum and or clinical placement [6, 13, 16, 17, 19, 20]. However these studies were not designed to evaluate the standard curriculum.

In addition, four papers reported quasi-experimental studies that tested a specific breastfeeding educational intervention designed to improve knowledge and attitudes, three were in the USA [21–23] and one in Hong Kong [24]. Two used a simple pretest and post-test method to measure nursing students’ knowledge related to breastfeeding [21, 22], and two had recruited comparison groups to compare the breastfeeding knowledge and attitudes of nursing students in both the intervention and comparison groups [23, 24]. The study by Dodgson and Tarrant [24] assessed nursing students’ breastfeeding knowledge and attitudes after they received the educational intervention, but without a baseline or pretest situation.

**Table 1** Summary of the characteristics of the included studies

Author(s) and country	Aim	Sample and setting	Design	Methods/instrument	Outcomes	CASP
Kakrani [20], 2015 India	To examine the knowledge levels of medical and nursing students about 10 steps of Baby-Friendly Hospital Initiative (BFHI) and to find out the gap in their knowledge about BFHI steps.	Fourth-year nursing students (n = 96) and third-year medical students (n = 102) in 1 medical college	Cross-sectional study	Questionnaire that was used to assess the knowledge gap with multiple choice questions regarding the 10 steps of successful breastfeeding	The average level of awareness among nursing (mean score: 5.84) as well as medical (mean score: 5.39) students about the ten steps.	9/14
Amin [17], 2014 Saudi Arabia	To explore the attitudes and knowledge of undergraduate female medical and education students about breastfeeding.	Medical students (n = 198) and students from College of Education (n = 323) from one university	Cross-sectional study	1. The 14 closed-ended breastfeeding knowledge questions (true-false and don't know options) or multiple choice 2. 17-item Iowa Infant Feeding Attitude Scale (IIFAS)	Students in the advanced years at both colleges, those who were married (22.1%) and those of rural origin (44.7%) had higher positive attitudes towards breastfeeding.	8/14
Dodgson [27], 2014 USA	To examine the beliefs and attitudes of health science university students toward formula feeding and breastfeeding.	Health science undergraduate students (n = 405; nursing student n = 84) and graduate students (n = 102; nursing student n = 52) recruited across 5 different programs at the colleges.	Cross-sectional study	Web-based validated survey instruments were used to assess the Theory of Planned Behaviour variables. These were: 1. The 19-item beliefs scale about the outcomes of breast and formula feeding 2. A 6-item breastfeeding and 6-item formula-feeding attitudes 7-point Likert scale	Significantly more positive breastfeeding attitudes and beliefs were found in graduate students (p = 0.0083)	9/14
Pajalic [15], 2014 Sweden	To describe nursing students' perspectives on promoting successful breastfeeding.	Nursing students (n = 65)	Qualitative study (Data retrieved from reflections)	All the students received a paper with one open-ended question: <i>What do you consider success factors that promote breastfeeding in Sweden?</i>	Information about the benefits of breastfeeding, traditions and cultural acceptance of breastfeeding practice, and government prohibition of infant formula were important factors in promoting successful breastfeeding.	7/10
Vandewark [13], 2014 USA	To examine the relationships and change between breastfeeding knowledge and attitudes in undergraduate nursing students at the beginning and at the end of their clinical education.	Sophomore (n = 40) and senior (n = 49) nursing students from two cohorts (Second-degree and traditional 4-year students)	Mixed methods study	1. The 22-item breastfeeding knowledge instrument was adapted from Brodribb et al.'s Breastfeeding Knowledge Questionnaire (BKQ) 2. The attitude component of this survey was based on 17-item IIFAS with 3 additional questions by Ahmed and El Guindy 3. Five open-ended questions	Only knowledge scores increased with progression in their nursing studies. Attitude scores did not differ significantly between two groups. Senior students reported to be more knowledgeable about breastfeeding following their nursing education, and sophomore students believed that they would learn about breastfeeding during their course work.	10/14

**Table 1** Summary of the characteristics of the included studies (Continued)

Ahmed [6], 2011 USA	To assess breastfeeding knowledge among senior nursing students and to identify the types of breastfeeding knowledge among these students. To investigate the relationship between the different types of breastfeeding knowledge.	Nursing students (n = 115) who had completed maternal/child nursing didactic and clinical courses at two universities	Cross-sectional study	Questionnaire adapted from BKQ consisted of 24 items were classified into 3 subscales: benefits of breastfeeding, physiology of lactation, and breastfeeding management	There was a significant difference in students' knowledge levels regarding the benefits of breastfeeding and breastfeeding management. There was also a positive relationship between students' knowledge about physiology of lactation and breastfeeding management.	10/14
Ahmed [16], 2011 Egypt	To assess breastfeeding knowledge, attitudes and perceived adequacy of breastfeeding education of nursing students, and to investigate their self-confidence to provide breastfeeding support for mothers.	Nursing students (n = 92) who had completed maternal/child nursing didactic and clinical courses.	Cross-sectional study	A 24-item breastfeeding knowledge questionnaire adapted from BKQ, 17-item IIFAS, and three questions related to self-confidence and adequacy of breastfeeding education.	Low mean knowledge score of 52%. Students' breastfeeding attitudes were unexpectedly neutral.	12/14
Brodribb [18], 2008 Australia	To describe the relationship between the cumulative length of personal breastfeeding duration and the breastfeeding knowledge, attitudes, confidence of Australian general practice (GP) registrars	Australian GP registrars (n = 483) in their final year of training.	Cross-sectional study	Investigator-developed Australian Breastfeeding Knowledge and Attitude Questionnaire (ABKAQ) consisting of 40-item knowledge scale and 20-item attitude scale.	The length of personal breastfeeding duration was found to influence confidence with breastfeeding. Registrars with brief personal breastfeeding duration (< 26 weeks) had lower breastfeeding attitudes, their knowledge levels were similar to doctors who had never breastfed.	9/14
Spear [19], 2006 USA	To assess basic breastfeeding knowledge and selected attitudes of junior and senior baccalaureate nursing students. To determine the need for inclusion of more in-depth information about breastfeeding in the undergraduate obstetric nursing course curriculum.	Junior (n = 32) and senior (n = 48) baccalaureate nursing students at a private university in the United States.	Cross-sectional study	1. Modified version of Smit's (2004) 20-item breastfeeding knowledge questions 2. One open-ended attitude question about breastfeeding	Higher knowledge score was associated with positive attitudes toward breastfeeding.	9/14
Gricco-Lizza [14], 2006 USA	To explore the breastfeeding attitudes and beliefs of junior nursing students.	Nursing students (n = 12) newly enrolled in an urban university baccalaureate nursing program in the United States.	Qualitative study (in-depth semi structured interview)	Broad open-ended questions were used to elicit the participants' thoughts, feelings, and experiences with breastfeeding and formula feeding.	Nursing students' personal experiences were important in developing their breastfeeding attitudes and beliefs. Students came from a predominantly breastfeeding family had the most positive attitudes towards breastfeeding.	9/10



**Table 1** Summary of the characteristics of the included studies (Continued)

<p>Davis [23], 2015 USA</p>	<p>To determine the effect of an evidence-based educational intervention on baccalaureate nursing students' knowledge and attitudes in relation to breastfeeding support provided for mothers.</p>	<p>Baccalaureate nursing students: Intervention group (n = 56); Control group (n = 57), at a public university</p>	<p>Intervention: 1 h lecture for all students. Experimental group -simulation role-play with a standardized patient Control group - watched a breastfeeding video</p>	<p>Pre/post-test: ABKAQ: 36 items for knowledge and 18 items for attitude</p>	<p>Significant difference in pre-test and post-test scores in intervention group students' breastfeeding knowledge and attitudes towards breastfeeding.</p>	<p>11/14</p>
<p>Gianelli [22], 2014 USA</p>	<p>To analyse the development of an online computer based breastfeeding training (BT) among undergraduate nursing students and the preliminary outcomes of this training.</p>	<p>Undergraduate nursing students (n = 82)</p>	<p>Intervention: 16 h of online computer based breastfeeding training consisted of five modules, in-person (web)</p>	<p>Pre/post-test with no comparison group. 74 multiple choice knowledge questions, and 9 items related to confidence.</p>	<p>Statistically significant difference between pre and post-test knowledge assessments in all of the five modules of the breastfeeding training.</p>	<p>8/14</p>
<p>Bozzette [21], 2013 USA</p>	<p>To examine changes in nursing students' knowledge after receiving content on breastfeeding and lactation in obstetrical course during their baccalaureate nursing education.</p>	<p>Fourth-year nursing students (n = 24)</p>	<p>Intervention: 1.5 h of lecture utilizing audiovisual and written materials, in-person</p>	<p>Pre/post-test 20-item breastfeeding knowledge questions (true-false option) adapted from the knowledge instrument developed by Marzailik (2004)</p>	<p>The breastfeeding education program significantly increased students' breastfeeding knowledge of the benefits and nutritional value and management of lactation.</p>	<p>9/14</p>
<p>Dodgson [24], 2007 Hong Kong</p>	<p>To determine the effectiveness of an infant feeding educational intervention on nursing students' knowledge levels</p>	<p>Nursing students: Intervention group (n = 111, fourth-year); Control group (n = 162, first and second-year)</p>	<p>Intervention: 10 h of didactic instruction, in-person; 8 weeks of perinatal clinical placement</p>	<p>Post-test 19-item knowledge survey (true-false and don't know options) A 6-item breastfeeding and 6-item formula-feeding attitudes 7-point Likert scale</p>	<p>Control group scored significantly lower on breastfeeding knowledge than the intervention group.</p>	<p>8/14</p>

### Measuring breastfeeding knowledge and attitudes

Several measures including subscales of larger tools were used to measure the breastfeeding knowledge and attitudes of health professional students or other participants. These were the Australian Breastfeeding Knowledge and Attitude Questionnaire [6, 13, 16, 18, 23] and the Iowa Infant Feeding Attitude Scale [6, 13, 17, 25].

Several studies assessed nursing students' knowledge related to breastfeeding by using modified survey tools with true/false, or don't know, or multiple-choice questions [17, 19–22, 24]. Two studies measured the participants' beliefs about the outcomes of, and attitudes towards, breastfeeding and formula-feeding using a modified version of the Minnesota Infant Feeding Questionnaires [26] using a 12-item scales with a 7-point response format [24, 27].

### Breastfeeding education received by students

#### *Standard curriculum*

Some studies described the current undergraduate curriculum indicating that breastfeeding was addressed during the maternal and child health subject. If described, these standard curriculum primarily consisted of classroom and clinical components, discussing topics such as the properties of breast milk, benefits of breastfeeding for both mother and infant, assessment parameters for effective breastfeeding, maternal support, and achievement of proper latch in a didactic instructional manner [6, 16, 19, 20]. In addition, practical experience was offered through clinical placement at a hospital based maternity unit where nursing students had opportunities to observe and interact with lactation consultants and nurses as they provided breastfeeding support for new mothers [6, 13, 16, 19].

#### *Specific breastfeeding education interventions*

The format and length of the specialised breastfeeding education programmes in the four studies included in this review varied. Two of the education programmes were based on the Baby Friendly Hospital Initiative (BFHI) 20-h breastfeeding curriculum [22, 24], one adapted this content in five online modules requiring 16 h to complete [22], and the other provided the theoretical content in 10 h of face-to-face instruction, and 8 weeks of clinical placement [24]. Learning content in the four studies consisted of evidence based breastfeeding information [21–24].

### Health professional students' knowledge about breastfeeding

Overall, the cross-sectional, descriptive studies found that nursing students, medical students and general practice registrars lacked knowledge about breastfeeding even after completing their maternal and child health unit of study, particularly in relation to how best to support mothers and infants and to intervene if necessary [6, 16–20]. Two

studies, one in Egypt [16] and one in the USA [6] reported that nursing students had higher knowledge about the benefits of breastfeeding for the baby and the cost benefits for families and society of breastfeeding but their knowledge of breastfeeding physiology and management was low, even following theoretical and laboratory based clinical education in their course in maternal and child nursing. Amin et al. found the breastfeeding knowledge scores were low irrespective of the educational disciplines of the students [17]. The responses of medical students and students from College of Education reflected the prevalence of many misconceptions regarding the timely initiation, duration and exclusivity of breastfeeding [17]. The study by Kakrani et al. explored the knowledge of senior medical and nursing students about the 10 steps of the BFHI in India, and found there was an average level of awareness among nursing and medical students about the ten steps [20]. They also found that female students were more aware of these BFHI steps than males after the breastfeeding education [20].

Three studies compared junior and senior nursing students on their knowledge of breastfeeding [13, 19, 24] including benefits, physiology and management. In one study both the junior and senior nursing students were aware of the benefits and physiology of breastfeeding at the two points in time, but knowledge of the management of breastfeeding was significantly higher in the group of graduating students [13]. In one qualitative study, the researcher assessed nursing students' knowledge of breastfeeding with their written responses to one question: "What do you consider success factors that promote breastfeeding in Sweden?" [15]. Most nursing students reported that promoting breastfeeding was important for infant health, and most students demonstrated knowledge about the advantages of breastfeeding, such as "breast milk provides stronger immune protection for the child than formula milk" [15].

Of the four studies that examined a breastfeeding education programme, each reported a significant positive difference between pre and post-test breastfeeding knowledge scores [21–24]. In one study the breastfeeding educational programme was effective in increasing nursing students' knowledge of the benefits and nutritional value of breastfeeding and management of lactation problems [21]. Moreover, the 16-h online breastfeeding training increased nursing students' level of knowledge related to breastfeeding and the majority believed that they were fully able to perform skills to support breastfeeding [22].

### Health professional students' attitudes towards breastfeeding

Cricco-Lizza used a qualitative approach to investigate the breastfeeding attitudes, beliefs, and personal experiences of nursing students ( $n = 12$ ) at the beginning of



their formal course work in maternal and child nursing, and the researcher suggested that nursing students' positive attitudes towards breastfeeding were crucial for promoting breastfeeding initiation [14]. In Egypt, Ahmed and El Guindy [16] reported midrange scores on breastfeeding attitudes amongst nursing students and Vandewark [13] found similar mid-range scores for nursing students in the USA with no differences between the mean breastfeeding attitudes scores of junior and senior nursing students.

One study in the USA found that over one third of nursing students believed that women should not breastfeed in public [19] and another reported that all students held this belief [14]. Two intervention studies compared the breastfeeding attitudes of nursing students in both the intervention and comparison groups [23, 24] and found the educational intervention did not change students' attitudes towards breastfeeding but it did alter attitudes towards formula feeding, with students being less favourable toward this practice [24]. Studies also reported a positive correlation between attitudes towards breastfeeding and breastfeeding knowledge [13, 14, 16, 19]. Ahmed and El Guindy found that despite Egyptian nursing students having low knowledge scores and not holding strongly positive attitudes towards breastfeeding, more than 70% of the students indicated they were confident or very confident about their ability to support breastfeeding [16].

#### **Factors influencing breastfeeding knowledge and attitudes**

In these studies, several factors were found to influence the level of breastfeeding knowledge and attitudes towards breastfeeding, including stage of student enrolment (for example first year versus final year students), previous personal breastfeeding experience, gender, cultural practices and government legislation.

In the Australian study of GP registrars, Brodribb et al. found that more than 52 weeks personal breastfeeding experience was associated with higher mean breastfeeding knowledge scores, and GP registrars who had personal experience of breastfeeding were more confident in supporting women [18]. For nursing students, important factors for a positive attitude to breastfeeding included: coming from a predominantly breastfeeding family [14], or being married, or originating from a rural area [17]. The study by Pajalic showed that nursing students' beliefs about the benefits of breastfeeding were influenced by traditions and cultural acceptance of the practice, and government restrictions on infant formula [15].

#### **Discussion**

This review has synthesised the findings of 14 studies that assessed nursing and other health professional students' knowledge and attitudes towards breastfeeding and

included four studies that specifically tested an educational intervention to improve breastfeeding knowledge.

The findings indicate that in some settings health professional students' knowledge of breastfeeding was limited, particularly in relation to breastfeeding assessment and management, and did not necessarily improve following the completion of a standard curriculum. Exposure to breastfeeding, either through the course, or personally, was associated with more positive attitudes towards breastfeeding amongst health professional students. Only two studies assessed health professional students' confidence to support breastfeeding women and Egyptian nursing students appeared highly confident despite low levels of breastfeeding knowledge [16].

The four studies that examined a specialised breastfeeding educational program appeared to increase nursing students' knowledge overall or aspects of their knowledge related to breastfeeding, as did the standard curriculum in some of the studies [13, 19, 23, 24]. In contrast, attitude towards breastfeeding did not appear to be altered by the educational interventions however one study reported that nursing students held less positive attitudes about infant formula after the intervention [24].

The second step of the Ten Steps to Successful Breastfeeding states that all healthcare staff should be trained in skills necessary to implement this policy [28, 29]. The included studies emphasised the importance of health professional students receiving education on breastfeeding and the skills to support new mothers to breastfeed. Despite this, there is variability in the quality of breastfeeding support provided by health professionals, particularly in-hospital postpartum care, and many women are dissatisfied with breastfeeding support and information they receive [3, 30]. This implies a gap, both in current undergraduate education, or ongoing education post registration, and in practice. Both nursing and medical students are educated about a wide variety of health concerns and conditions and breastfeeding education may not be prioritised [31]. If students receive no, or limited, education before their clinical placement, this may compromise the information and support women are offered. Furthermore, nursing students in the USA, Egypt, China, Taiwan, and elsewhere, provide care to women in postpartum units, under supervision [6, 16, 32] and if the supervising health professionals have not had adequate ongoing education they may not appropriately support and mentor the students.

This review highlights the need to determine how breastfeeding knowledge and skills are best facilitated in undergraduate curricula to help students relate theoretical breastfeeding knowledge to practice. Commentators emphasise the need for standardised breastfeeding education curricula to ensure that all undergraduate nursing students are taught similar core breastfeeding concepts regardless of the nursing programme attended [33].



Implementation guidelines for the Ten Steps to Successful Breastfeeding state that all healthcare staff should receive breastfeeding education including both the knowledge and skills to support women to breastfeed [28, 29]. For facility personnel whose role may involve educating, advising or assisting women in relation to breastfeeding, they must have a minimum of 20 h of breastfeeding education, consisting of at least 8 hours theoretical education and at least 3 hours relevant supervised clinical experience on breastfeeding [28, 29]. The education program may include various delivery options such as workshops, face-to-face or online education [29]. Two intervention studies were based on the BFHI 20 h module but both adapted this by either reducing the content to 16 h online [22] or reducing to 10 h with a significant clinical component of 8 weeks [24]. Both had positive effects on nursing students' breastfeeding knowledge.

However, given the constraints of generalist nursing curricula and other courses, time does not necessarily permit a 20 h module on breastfeeding. As a consequence, curricula across the globe vary in the time devoted, and content provided. For example, in the review of educational support for health professionals, Watkins and Dodgson [9] comment that the length of breastfeeding education varied considerably from 1.5 h to 24 h of face-to-face content ranging from one to eight sessions. In this present review the specialised breastfeeding programmes for nursing students varied from as little as 2 h to 16 h of didactic lecture style as well as simulation role-play or online computer based learning modules with varying impact on nursing students' breastfeeding knowledge and attitudes.

A range of formats and educational strategies were used in the intervention. These included didactic lecture style as well as simulation and clinical placement. Strategies such as evidence based seminar updates [33] with case studies [34] have been identified as useful approaches, in conjunction with, or perhaps replacing, didactic classroom lectures. Providing students with opportunities to practise breastfeeding management skills before actually caring for clients in a clinical setting may increase confidence [16]. Increasingly online education is used in undergraduate curriculum. Recently, researchers found that the additional online module improved undergraduate nursing students' learning as well as their confidence in the clinical setting [35]. Researchers suggest a variety of forms of educational programmes, including workshops, seminars and more traditional teaching programmes are required [20, 33, 34].

Healthcare professionals who are experienced with breastfeeding management play a crucial role in helping nursing students practise basic breastfeeding assessment skills learnt in the classroom and laboratory [6, 32]. However, this may be problematic if the healthcare professionals lack knowledge and skill or are inappropriate in the approach they take to providing breastfeeding

support. The review by Watkins and Dodgson [9] and Spiby et al. [8] indicate that not all health professionals are adequately prepared, and found that many do not feel confident and knowledgeable in managing breastfeeding problems.

#### **Influence of socio-cultural context on breastfeeding attitudes**

It was evident in the study by Pajalic from Sweden that the nursing students overall held a positive attitude towards breastfeeding [15]. Scandinavian countries are well-known for their strong public health policies supporting breastfeeding, and their experience of high levels of breastfeeding initiation and maintenance for the first 6 months after birth [36, 37]. In contrast in the USA, breastfeeding rates and the mean breastfeeding attitude scores are lower than those of many other countries [13, 38]. Participants in one study were hesitant to continue breastfeeding because feeding the baby themselves challenged their independence, and they had concerns about intimacy with breastfeeding [14].

In the Middle Eastern countries and countries like Egypt where Islam is the dominant religion, the community and women are guided by the Qur'an which supports breastfeeding [39]. It was therefore surprising that the nursing students' attitudes towards breastfeeding, in Egypt, were neutral with low breastfeeding knowledge scores [16]. It may be that when these Middle Eastern students were surveyed they had not completed their education and lacked the clinical experience that would potentially enhance their breastfeeding knowledge and skills [16].

#### **Limitations**

This review may be limited by the commencement date of year 2000. Other relevant papers published before this date e.g. Freed and colleagues [40] have informed our discussion. The review is also limited by the quality of some of the included studies. Most included studies had a small response rate [13, 18, 20, 27], small sample sizes [13, 16, 19, 21, 22] and participants were not randomised in the intervention studies [21, 22, 24]. Reliability or validity of the measures used to assess nursing students' breastfeeding knowledge and attitudes were not presented in all studies. In a number of the included papers we could not determine whether the study sample was representative of the population. Some participants completed the maternal and child health course 1 year prior to the survey and therefore capacity for recall may have affected their ability to answer the questions accurately [13, 19]. Some papers do not indicate whether or not the participants had received any breastfeeding content prior to the survey [15, 27].

### Implications for education of health professionals

These studies emphasise that healthcare professionals, including nurses and doctors should participate in ongoing breastfeeding education [6, 40]. Particularly important is the need to challenge nurses' attitudes and cultural norms related to breastfeeding, in addition to more traditional items such as the treatment methods for mastitis, to fully prepare nursing students to provide care for new mothers [19, 41].

It is interesting that no recent studies of nursing students' breastfeeding knowledge and attitudes were conducted in the United Kingdom (UK) and Australia. This may be because midwives primarily provide breastfeeding support to women. There have been recent studies of both registered midwives' breastfeeding knowledge and attitudes in Australia [42] and student midwives in UK [43]. It is however important that nursing and other health professional students also have the basic knowledge and skills to support breastfeeding women when they are on a post-partum unit, and that they have appropriate supervision and support from qualified health professionals [9]. It is important that nursing students in countries like UK and Australia, also receive some education related to breastfeeding because they may encounter breastfeeding women in general practices [44], paediatric wards and also in emergency departments [45].

While the findings of this review highlight the need for improvements in breastfeeding education in the baccalaureate nursing curriculum, this review provides little guidance as to what content is needed, how long the theoretical and clinical experiences should be and what is the best mode of delivery to increase knowledge and skill. The question remains whether nursing and other health professional students require 20 h of education at undergraduate level including how to manage breastfeeding problems, in order to provide the best support [46].

### Conclusion

It is essential that health professional students have a positive attitude towards breastfeeding, and are able to provide breastfeeding women with the basic information they require. From the studies reviewed, baccalaureate students are considered novices who lack basic breastfeeding knowledge. Not all health professionals are adequately prepared and feel confident and knowledgeable in managing breastfeeding problems. In conclusion, it appears that nursing students can benefit from targeted programmes to increase breastfeeding knowledge and attitudes, and their confidence in helping and guiding breastfeeding mothers. To ensure that future health professionals are well prepared to support breastfeeding. It is important that the curriculum is evidence based and culturally appropriate.

### Abbreviations

CASP: Critical Appraisal Skills Programme; PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses; UNICEF: United Nations Children's Fund; WHO: World Health Organization

### Acknowledgements

We would like to acknowledge the authors who conducted and published the original studies.

### Funding

No funding was sought or received for this study.

### Availability of data and materials

All data generated or analysed during this study are included in this published article.

### Authors' contributions

SFY carried out the literature search and initial screening. SFY, VS, YS and EB then reviewed each of the identified papers and worked in pairs to undertake the quality review. SFY, VS, YS and EB were responsible for the design of the search strategy, data analysis, critical appraisal, and drafted the manuscript. All authors read and approved the final manuscript.

### Ethics approval and consent to participate

Not applicable.

### Consent for publication

Not applicable.

### Competing interests

The authors declare that they have no competing interests.

### Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

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Received: 5 August 2017 Accepted: 14 February 2018

Published online: 20 February 2018

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## Chapter 3: Methodology

### 3.1 Introduction

Chapter 2 presented the findings of a systematic review of the literature relative to nursing students' or other health professional students' knowledge, attitudes or experiences of breastfeeding. This review found that in some settings, health professional students demonstrated mid-range scores on breastfeeding attitudes. Further, their understanding of breastfeeding was limited and did not necessarily improve following the completion of standard curriculum.

As such, Chapter 3 presents an overview and rationale for the methodological approach and methods used to answer the following research questions:

1. What are the breastfeeding knowledge and attitudes of nursing students before and after receiving theoretical and clinical educational intervention relevant to breastfeeding?
2. Is there a change in breastfeeding knowledge and attitudes of nursing students before and after receiving education on and clinical learning experience with breastfeeding?
3. What are the factors that influence nursing students' knowledge and attitudes towards breastfeeding before and after theoretical education and clinical placement?
4. What are the perceptions of nursing students, new mothers, nursing staff and teachers in relation to the role and experiences of nursing students in supporting breastfeeding?

### 3.2 Study Design

To address the research questions, a mixed-methods design, which was both quantitative and qualitative in nature, was employed in this research project. Mixed-methods research is defined as the combination and integration of both quantitative and qualitative approaches (Creswell, 2013). It has increased in popularity over the past decade and is now commonly applied in areas such as nursing research and health science (Creswell & Clark, 2017). Mixed-methods research has also been referred to as the third research paradigm, and can help bridge the schism between quantitative and qualitative methods (Shannon-Baker, 2016). Both approaches have their own inherent weaknesses but can be greatly strengthened when combined with the unique qualities of the other (Tashakkori & Teddlie, 2010). Further, pragmatism is a philosophical standpoint or paradigm that is frequently considered to be the foundation of mixed-methods research (Bishop, 2015; Morgan, 2007; Tashakkori & Teddlie, 2010). As a philosophy, pragmatism challenges the notion of a single, absolute truth being attainable (Johnson & Onwuegbuzie, 2004; Maxcy, 2003; Scott & Briggs, 2009). It proposes a worldview in which truth is subjective and variable rather than fixed and immutable. Pragmatism offers a set of beliefs around knowledge and inquiry that differentiates it from purely positivist constructs as well as purely interpretivist or constructivist approaches (Johnson & Onwuegbuzie, 2004; Maxcy, 2003). Leaders in the mixed-methods field view pragmatism as a supportive philosophical paradigm (Creswell & Clark, 2017; Johnson & Onwuegbuzie, 2004; Morgan, 2007; Tashakkori & Teddlie, 2010), while pragmatists concede that quantitative experimental methods of data collection are fallible. Hence, to address this they suggest that credibility and rigour can be maintained by combining both quantitative and qualitative methods of data collection (Scott & Briggs, 2009). As

pragmatists also view neither method as superior or capable of answering all questions, the weighting given to each within a specific research design is dependent upon the type of data that need to be collected to address the research question. Therefore, at the practice level, a pragmatic approach can facilitate problem-solving, with the methods individually tailored to address a specific problem (Johnson & Onwuegbuzie, 2004; Maxcy, 2003; Scott & Briggs, 2009). However, the challenge remains for pragmatic researchers to maintain both subjectivity in their own reflections on research and objectivity in data collection and analysis (Bishop, 2015; Shannon-Baker, 2016).

Four major types of mixed-methods designs have been described, which differ along two dimensions of timing and emphasis. The four major types are convergent parallel design, explanatory sequential design, exploratory sequential design and embedded design (Creswell & Clark, 2017). In the BONUS Project, a convergent parallel mixed-methods design was used, whereby quantitative and qualitative data collection was conducted within the same time frames. Subsequently, the two sets of data received equal weight and separate analysis, and were compared and integrated for overall interpretation (Creswell & Clark, 2017). The convergent parallel design provided a depth of responses that would not have been achievable through the sole use of quantitative design, with the additional benefit of a good degree of convergence between quantitative and qualitative data, thus, increasing the validity of the study (Doyle, Brady & Byrne, 2016). In the final step of the research process, it can be very challenging for researchers to converge two sets of very different data and results (Andrew & Halcomb, 2009; Creswell, 2013). However, the advantage of collecting both quantitative and qualitative data brings together different perspectives to compare and integrate results.

The BONUS Project was conducted between May 2016 and February 2018. This quantitative study used a pre- and post-test design and two nursing student cohorts to examine students' breastfeeding knowledge and attitudes. The first cohort (tested before and after theoretical and laboratory-based skills learning) comprised of second-year students (Cohort C), and the second group (tested before and after clinical placement) concerned third-year students entering their fourth year of study (Cohort B). The qualitative study included focus group meetings and small group interviews. This intended to explore the expectations and experiences of nursing students in supporting breastfeeding during clinical placement from the perspectives of the students themselves, new mothers, nursing staff and teachers. The findings were integrated during the interpretation phase to inform the discussion in this thesis. Figure 3.1 illustrates the study design of the research project.

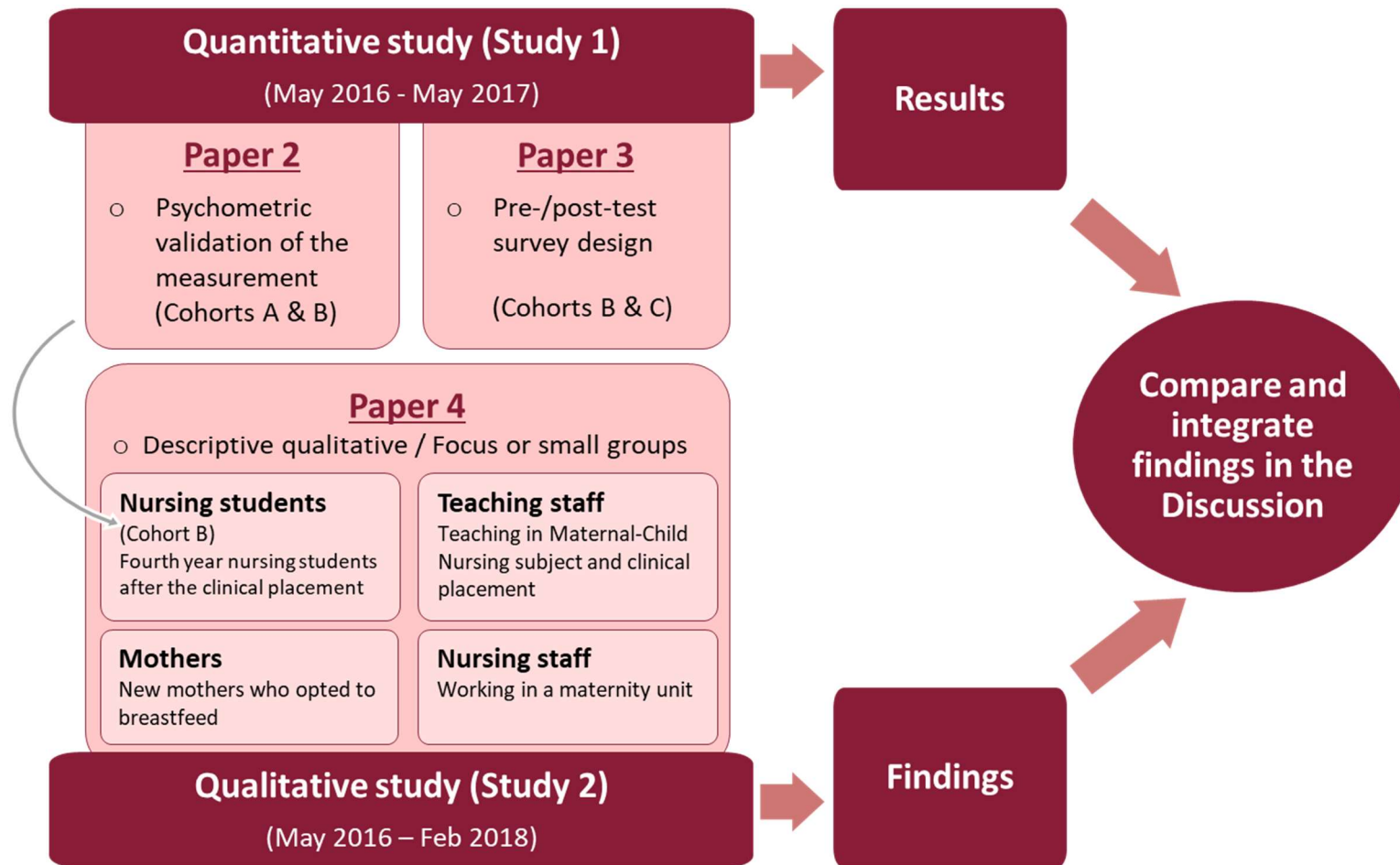


Figure 3.1. Study design of the BONUS Project.

### 3.3 Study Setting

This research project was undertaken in the Department of Nursing at CUMT and at a postpartum nursing centre, each located in southern Taiwan. First, CUMT comprises three colleges and 17 academic departments. Faculty members in the Department of Nursing specialise in a variety of areas including bioethics, maternal and child nursing, paediatric nursing, healthcare informatics, medical and surgical nursing, family nursing, community health nursing, hospice care and women's health. In 2018 there were four professors, 14 associate professors, 17 assistant professors, 12 lecturers, 37 clinical practice teachers and seven teaching assistants. The Maternal and Child Nursing and Laboratory theoretical component is usually taught by four academic staff members who supervise students during their clinical placement in a hospital where postnatal care is provided for women and their newborns.

Approximately 100 BN students commence the bachelor's program each year. All nursing students at CUMT are required to undertake 128 credit points, the weightings of which are based on the curriculum content and educational objectives that each subject of study is required to achieve. Students undertake theoretical breastfeeding learning in the Maternal and Child Nursing subject, comprising three hours of face-to-face theoretical content and six hours of laboratory-based skills learning on breastfeeding. In the program's fourth and final year, students provide maternity care for childbearing women in a four-week clinical placement. They spend approximately one week in a postnatal unit and have the opportunity to support mothers with their breastfeeding.

Data for this study were collected from mothers who were staying in a postpartum nursing centre following childbirth. Also known as a 'doing the month'

centre, these facilities receive women and babies who require postnatal care following hospital discharge. Staff in these centres combine traditional and cultural postnatal practices (e.g., traditional medicinal cuisine) with modern medical expertise to provide 24-hour care for mothers and babies. While admitted, women and their partners or husbands can stay for up to six weeks following the birth of their child.

Accordingly, ethics approval for this research project was granted from the Human Research Ethics Committee at Western Sydney University. The approval number is H11611 (see Appendix 1).

### **3.4 Survey Design and Validation Measures (Study 1)**

The aim of the quantitative study was to examine the effects of theoretical and clinical learning experience on nursing students' knowledge and attitude towards breastfeeding. The study used a pre- and post-test survey design and two cohorts of nursing students at CUMT, before and after their theoretical learning and clinical placement (Yang, Schmied, Burns & Salamonsen, 2018). To conduct a quantitative study of the current knowledge and attitudes of Taiwanese nursing students, a validated measurement of breastfeeding knowledge and attitudes was required. As such, the Australian Breastfeeding Knowledge and Attitude Questionnaire (Short-Form) (ABKAQ-SF) was selected as an appropriate tool for study.

#### **3.4.1 Sample**

The sample for Study 1 comprised three cohorts of nursing students from the Department of Nursing at CUMT. Data from Cohorts A and B were used to validate the measure in Chinese, and Cohorts B and C were used in the pre- and post-test study. The time line of data collection for all cohorts of nursing students is provided in Table 3.1.



Table 3.1:

## Time Line of Data Collection for Study 1

Data collection	Cohort	Year (Semester)	<i>n</i>	Description	Data reported in Publications
2016 May	A	2 (2)	97	Post-theoretical education; Pre-clinical placement	Paper 2 (Validation paper)
	B	3 (2)	108	Post-theoretical education Pre-clinical placement	Paper 2 and 3 (Validation and outcomes paper)
2016 October	C	2 (1)	111	Pre-theoretical education	Paper 3 (Outcomes paper)
2016 December	B	4 (1)	104	Post-clinical placement	Paper 2 and 3 (Validation and outcomes paper)
2017 May	C	2 (2)	112	Post-theoretical education; Pre-clinical placement	Paper 3 (Outcomes paper)

The sample for the quantitative study (Paper 3, Chapter 5) comprised two cohorts of nursing students from the Department of Nursing at CUMT. Cohort C ( $n = 111$ ) comprised second-year students who were surveyed before and after receiving theoretical breastfeeding education (pre-theory, October 2016 and post-theory, May 2017), while Cohort B ( $n = 104$ ) was surveyed after education but prior to clinical placement in their third year (pre-clinical, May 2016), and again following their experience with supporting breastfeeding women during fourth-year placement (post-clinical, December 2016). In total, 215 participants completed both the pre- and post-survey questionnaires, indicating a response rate of 96.4% (215/223) (Yang et al., 2018).

### 3.4.2 Study Measures

The ABKAQ-SF consists of a 20-item knowledge subscale (ABKQ-20) and an 18-item attitude subscale (ABAQ) (Brodrribb et al., 2008a). First, the ABKQ-20 uses ‘correct–incorrect’ and ‘don’t know’ categories. Of the 20 knowledge items, 11 are incorrect. Each correct answer is scored one point, and incorrect and ‘don’t know’ responses are scored zero, with higher scores indicating better knowledge about breastfeeding. Conversely, the 18-item ABAQ subscale uses a five-point Likert scale response format that ranges from strongly disagree (1) to strongly agree (5). Of the 18 items, 14 are negatively worded; again, higher scores indicate more positive attitudes towards breastfeeding.

To conduct the cross-cultural study in Taiwan, permission was sought to use the questionnaire by Brodrribb et al. (2008a), who originally developed the ABKAQ-SF. To ensure that the translated version was valid and culturally appropriate, the English version of the questionnaire was translated into Chinese by two nursing experts proficient in both languages. Following the forward translation, the Chinese version of the ABKAQ-SF was backward translated into English by two independent bilingual experts. Any discrepancies in each translation were discussed until agreement was achieved regarding the best version of each item. This was validated using the guidelines suggested by Råholm, Thorkildsen and Löfmark (2010).

In addition to the standardised scales, key demographic questions were asked of participants’ age, gender, exposure to breastfeeding in their family of origin or in the community, as well as their perceptions of public breastfeeding. See Appendix 2 for the survey and demographic sheets.

### ***3.4.2.1 Psychometric Analysis of the 18-item ABAQ***

Validation of the ABAQ in Chinese was published in the *Journal of Human Lactation* and is presented in Chapter 4. In summary, a prospective two-cohort survey design—which included baseline and follow-up data collection on nursing students ( $n = 205$ ) in Cohorts A ( $n = 97$ ) and B ( $n = 108$ ) in a four-year BN program—was completed in the Chinese version of the ABAQ. The items were assessed for content validity, construct validity and internal consistency to examine group differences and responsiveness of the revised 12-item ABAQ (ABAQ12) (Yang, Schmied, Burns, Brodribb & Salamonson, 2018).

### **3.4.3 Data Collection**

Nursing students enrolled in the Maternal and Child Nursing subject and clinical placement at CUMT were invited to participate in the data collection. Prior to administering the survey, students were provided both written and verbal information about the study by their tutor; this included an information sheet detailing anonymity and the voluntary nature of participation. Students were also informed that if they chose not to participate in the study it would neither affect their academic performance nor have any influence on their relationship with staff or the university. Individuals who agreed to participate were asked to sign a consent form indicating that they understood and agreed with the information provided. The researcher then provided the tutors with hard copies of the survey for each consenting student to complete in class. All surveys were scanned and securely stored in a locked, password-protected computer. All hard-copy surveys were kept in a locked filing cabinet in the first author's office at the university.

### **3.4.4 Data Analysis**

Quantitative data collected through the survey were entered into the Statistical Package for the Social Science (SPSS) version 24 for Windows to undertake statistical analysis. Univariate statistical analyses comprised of distribution of frequency, percentage, means and standard deviation were used to describe the personal characteristics and to aggregate scores of each construct measured by multiple item scales. Meanwhile, bivariate statistical analyses, comprised of analysis of variance and Pearson's correlation, were used to explore for relationships between nursing students' knowledge and attitudes towards breastfeeding. As the continuous scores were not normally distributed, group differences in pre- and post-test scores were examined using the non-parametric Wilcoxon signed-rank test.

### **3.5 Descriptive Qualitative Study (Study 2)**

The aim of the qualitative study was to explore the expectations and experiences of nursing students in supporting breastfeeding. These concerned the perceptions of the students themselves, new mothers, nursing staff and teachers.

A descriptive qualitative study was conducted to analyse both focus and small group data (Sandelowski, 2000, 2010). The design of this research approach offers healthcare researchers a methodological choice for study, as it allows for gathering meaningful information from participants and provides rich, descriptive content from an individual or a group perspective. Descriptive qualitative studies are characterised by lower levels of interpretation than high-inference qualitative approaches such as phenomenology or grounded theory, which increase the likelihood of agreement among multiple researchers (Colorafi & Evans, 2016; Sandelowski, 2000, 2010).

### **3.5.1 Participants**

Four participant groups were involved in Study 2. This included nursing students, university teaching staff, maternity unit nursing staff and mothers of newborns.

#### ***3.5.1.1 Nursing Students***

Fourth-year nursing students were invited to participate in this qualitative study and complete a survey after they had concluded their clinical placement. A total of eight students accepted the offer to participate for interview.

#### ***3.5.1.2 University Teaching Staff***

Six teaching staff members were invited by letter to participate in a focus group. All six accepted the offer. Three of the participants taught the theoretical Maternal and Child Nursing subject at the university, and the remaining three were teaching staff who facilitated nursing students during the clinical placement component.

#### ***3.5.1.3 Maternity Unit Nursing Staff***

The two head nurses in charge of a hospital maternity unit were invited by letter to participate in the study. In addition, nursing staff from the maternity unit who were supervising or mentoring nursing students during their placement were provided with information about the study. In turn, two staff members agreed to participate. The backgrounds of all participating nursing students, teachers and staff ( $n = 18$ ) are provided in Table 3.2.

Table 3.2:

Backgrounds of Nursing Students, Teachers and Staff

	<i>n</i>	Age group (Years)	Work experience (Years, range)
Nursing student	8	21–22	–
University nursing teacher	6	38–53	8–30
Head nurse	2	31–40	10–15
Nursing staff	2	20–30	3–4

#### 3.5.1.4 Mothers of Newborns

Mothers who had given birth at a baby-friendly accredited hospital in the local area, received breastfeeding support from nursing students and who subsequently stayed at a postpartum centre were invited to attend a group meeting. The researcher provided each a flyer about the study; this was posted on a wall at the postpartum nursing centre. Staff were also instructed to tell women about the study and indicate to them if they were interested.

A total of 12 mothers agreed to participate. They were all married and their babies were aged between one and four weeks. All participants, except one, were first-time mothers, and eight had full-time jobs to which they planned to return within the following 10 weeks. Sociodemographic characteristics of all participating mothers ( $n = 12$ ) are outlined in Table 3.3.

Table 3.3:

## Sociodemographic Characteristics of Participating Mothers

<b>Variables</b>	<b><i>n</i> (%)</b>
Age group	
18-24	1 (8)
25-30	2 (17)
31-34	7 (58)
35-40	2 (17)
Education level	
High school	1 (8)
Associate degree	1 (8)
Bachelor's degree	5 (42)
Master's degree	5 (42)
Para	
Primipara	11 (92)
Multipara	1 (8)
Full-time work	
Yes	8 (67)
No	4 (33)
Time to return to work ( <i>n</i> = 8)	
Less than eight weeks	1 (13)
Eight weeks	6 (74)
10 weeks	1 (13)

### 3.5.2 Data Collection

Overall, two focus group meetings and seven small group interviews were conducted between May 2016 and February 2018. The purpose of a focus group is to explore participants' views and beliefs on a specific topic, and to provide researchers with individual and shared perspectives (Cheng, 2014). While there is little clarity on

the optimal size of a focus group, Liamputtong (2013) stated that four to 12 individuals is appropriate. As only two or three participants were available to partake in this study at the same time, several small group interviews were conducted. At the start of each focus or small group interview, the researcher obtained written consent from participants. With permission, the interviews were documented using a digital recorder.

### ***3.5.2.1 Nursing Students***

In both the focus and small group interviews, participants were asked questions related to their role as students in supporting mothers with breastfeeding, and were prompted for suggestions on the theoretical program and clinical placement. These interviews were held in a consultation room in the Department of Nursing at CUMT. The demographic sheets and interview questions are presented in Appendix 3.

### ***3.5.2.2 University Teaching Staff***

Participants in the first focus group consisted of three teaching staff members who taught in the theoretical Maternal and Child Nursing subject at the university and three clinical supervisors who facilitated nursing students during clinical placement. The aim of this focus group was to collect information on participants' perspectives of the current breastfeeding program, and nursing students' learning status. Again, the interviews were held in a consultation room at the university. The demographic sheets and interview questions are presented in Appendix 3.

### ***3.5.2.3 Maternity Unit Nursing Staff***

Nursing staff from the maternity unit participated in one small group interview to share their perspectives on the attitudes, knowledge and skills of nursing students regarding breastfeeding. Head nurses from a hospital maternity unit



participated in a separate small group interview. These separate groups facilitated interaction between participants, especially for nursing staff members who were more comfortable without their managers present. The group interviews were held in a private room in the hospital, with both closed and open-ended (interview) questions related to this data collection component asked. These are presented in Appendix 3.

#### **3.5.2.4 Mothers of Newborns**

Four small group interviews with mothers of newborns were conducted in the conference room at a postpartum centre, also known as a ‘doing the month’ facility. During this period, participants’ babies were aged between two and six weeks old. Mothers were asked questions related to their current or previous experience with breastfeeding, on the breastfeeding information obtained while in hospital and regarding breastfeeding support received from nursing staff and students. Closed and open-ended (interview) questions related to this data collection component are presented in Appendix 3.

#### **3.5.3 Data Analysis**

The focus group and small group interviews were conducted in Mandarin and transcribed from audiotapes into traditional Chinese characters. These transcripts were then translated into English for reporting purposes by a bilingual expert. After, one bilingual expert together with the researcher listened to the recordings in conjunction with the English transcripts to verify the translation. The researcher then read and re-read the transcribed data to ensure the transcription was accurate and to start the coding process; the transcribed data were stored in Microsoft Word documents for management and analysis. Thematic analysis was next used to identify, analyse and report on themes that emerged from the qualitative data (Braun & Clarke, 2006). This approach to analysis was chosen for its effectiveness in

unveiling patterns within datasets that are important when exploring phenomena in a qualitative descriptive study.

The following table demonstrates individual coding for each qualitative dataset and how this was then integrated into the first theme – “high expectations”.

Data from interviews	Sub theme title or code	Theme
Mothers		
<i>Mums often worry that they don't make enough breastmilk after birth, so we need to teach them the knowledge and skills about lactation</i>	Nurses role: teaching mothers breastfeeding skills and knowledge	High expectations (related to knowledge and skills)
<i>We must be aware of the mum's psychological needs for breastfeeding and provide her with required care in a day shift</i>	Nurses role: awareness of emotional needs of mothers	
Teachers		
<i>Before the students approach new mothers, they need to practice hand expression of milk and how to assist mothers to position breastfeeding comfortably</i>	Nurses must have knowledge and skills about breastfeeding	
Head nurse		
<i>It is important that the nursing program provide breastfeeding knowledge and concepts to students</i>	Nurses must come with practical skills and knowledge	
Mothers		
<i>The nurse taught me how to hand express milk</i>	Teaching skills	

### 3.6 Data Integration (Quantitative and Qualitative)

This research project employed a mixed-methods approach using both quantitative and qualitative components. The data from each phase were analysed

separately; those quantitative in nature were completed using IBM SPSS version 24 software, while Quirkos (a qualitative data analysis software) was used to examine and organise the qualitative transcription into themes. The common findings from both studies included the need for educational programs to be underpinned by a pedagogical approach that enhances students' knowledge and skills in communicating effectively with women.

### **3.7 Ethical Considerations**

Ethics approval for this research project was granted in May 2016 from the Human Research Ethics Committee at Western Sydney University. The approval number is H11611 (see Appendix 1). The formal letters from the Supervisor of the Women and Children's Hospital and the Director of Nursing Department, Chung Hwa University of Medical Technology in Taiwan, giving permission for the researcher to undertake data collection at the postpartum centre, the maternity unit and the university (see Appendix 4).

Participation in the project was completely voluntary and participants were provided detailed information about the study by the researcher. This included an information sheet detailing the study and assuring their rights to withdraw at any time without need for a reason. Those who agreed to participate were asked to sign a consent form indicating that they understood and agreed with the information provided. This form was provided in Chinese and all data were de-identified and made confidential, meaning participants' names were not stored thereafter. See Appendix 5 for the participant information sheets and consent forms.

### **3.8 Reflexivity**

In undertaking this mixed-methods research project it was important to consider and clarify the relationship between the researcher and the study

participants. The researcher's clinical work experience as a staff nurse for maternal and child care at a local hospital in Taiwan must be taken into consideration. The researcher has considerable experience providing care to childbearing women, newborns and their families, and has also taught maternal and child health at both university and in the community. Her position as an educator and maternal and child nurse may have affected the research aims and focus in the data, and her knowledge of the university teaching staff may have enhanced recruitment. This may have implications for how the interviews proceeded, or may have interfered with the collection and interpretation of the data. However, the researcher was not known to any of the students who participated in the focus group interviews, and had only briefly met the nursing staff from the maternity unit in her role as an academic.

On a personal note, I, as the researcher, used reflexivity to explore my position as an insider. This included considering how my previous role as a lecturer may affect the teaching staff at CUMT, some of whom have been my colleagues in the past. Similarly, I have previously worked at the maternity unit and may be known by some of the nursing staff. To manage the influence that familiarity with some participants may have had on data collection and analysis, I discussed the conduct of the interviews and data analysis with my supervision team. Field notes were also collected throughout the data collection phase to capture reflections on the focus group and interviews. I discussed the preliminary analysis with the supervision team who supported me in developing the final analysis, and, in this way, was able to reflect on participants' experiences in a genuine way. The findings presented here are based on participants' own contributions to the study, evidenced by the presentation of verbatim quotations (Schneider, Whitehead, LoBiondo-Wood & Haber, 2016).

### **3.9 Conclusion**

This chapter outlined the methodology and methods used in this doctoral research. To address the research questions, a mixed-methods design was employed. The value of this approach derives in its ability to collect both quantitative and qualitative data and bring together different perspectives to compare and integrate results. First, quantitative data were collected using a pre- and post-test survey design to assess students' knowledge and attitude towards breastfeeding, before and after their theoretical learning and clinical placement. Second, qualitative data were collected by conducting focus groups and small group interviews with four different participant groups.

This chapter also presented the reflexive positioning of the researcher and ethical considerations from the research project. The following chapters will present the published findings, including the ABKAQ-SF tool validation, the quantitative results and the qualitative findings of the research project.

## **Chapter 4: Validation of the Chinese Australian Breastfeeding Attitude Questionnaire**

### **4.1 Publication (Paper 2)**

Yang, S.-F., Schmied, V., Burns, E., Brodribb, W., & Salamonson, Y. (2018).

Validation of the Chinese version of the Australian Breastfeeding Attitude Questionnaire. *Journal of Human Lactation*, 34(4), 674–681.

doi:10.1177/0890334418761567 (Impact Factor: 2.349)

### **4.2 Relevance to the Thesis**

To conduct a study on current knowledge and attitudes of Taiwanese nursing students, it was important to use a validated measurement of breastfeeding knowledge and attitudes. As such, the ABKAQ-SF was selected and translated into Chinese. To ensure that the translated version of the ABAQ was valid and culturally appropriate, the established procedure of forward and backward translations was undertaken, with all items subsequently assessed for construct validity, content validity and internal consistency. In turn, this subscale was used to assess group differences and responsiveness of the ABAQ12.

## 4.3 Paper 2



### Original Research



# Validation of the Chinese Version of the Australian Breastfeeding Attitude Questionnaire

Journal of Human Lactation  
2018, Vol. 34(4) 674–681  
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DOI: 10.1177/0890334418761567  
journals.sagepub.com/home/jhl

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### Abstract

**Background:** The Australian Breastfeeding Knowledge and Attitude Questionnaire–Short Form (ABKAQ-SF) was designed to measure breastfeeding knowledge and attitudes of health professionals. To date, a Chinese version of the attitude component of the ABKAQ-SF (ABAQ) is not yet available and has not been cross-validated with nursing students.

**Research aims:** This study aimed to examine (a) the psychometric properties of the ABAQ and (b) group differences and responsiveness of the revised 12-item ABAQ (ABAQ12) among nursing students in Taiwan.

**Methods:** Using a cross-sectional two-cohort study design, nursing students in Years 2 and 3 of a 4-year bachelor of nursing program ( $N = 205$ ) completed the Chinese version of the ABAQ, translated using forward and backward translations. Content validity, internal consistency reliability, construct validity, group differences, and responsiveness of the Chinese version of the ABAQ were assessed.

**Results:** Using the principal axis factoring procedure of exploratory factor analysis to examine the dimensionality of the ABAQ, a one-component structure was identified. Six items were deleted, based on the average interitem correlation ( $< 0.2$ ), low corrected item-total correlation ( $< 0.35$ ), and low factor loading ( $< 0.3$ ). Confirmatory factor analysis of the ABAQ12 supported a one-factor solution, with good overall model fit (goodness-of-fit index = 0.949, Tucker-Lewis index = 0.951, comparative fit index = 0.965, root mean square error of approximation = 0.042). Responsiveness of the ABAQ12 scores indicated a positive change in breastfeeding attitude between the pre- and postclinical placement period.

**Conclusion:** The Chinese version of the ABAQ12 is valid, reliable, and responsive and is suitable for assessing the breastfeeding attitudes of nursing students in the Taiwanese higher education settings.

### Keywords

breastfeeding, breastfeeding attitudes, nursing students, reliability, responsiveness, validation

### Background

Breastfeeding provides optimal nutrition for infants' healthy growth and development and provides health benefits for mothers (World Health Organization, 2015). Breastfed infants experience a reduction in mortality and morbidity from infectious diseases such as respiratory tract infections, lower rates of sudden infant death syndrome, and a reduction in their risk of acquiring the illnesses later in life (Sankar et al., 2015; Victora et al., 2016). Furthermore, breastfeeding for more than 12 months is associated with a 26% reduction of breast cancer and 35% reduction of ovarian cancer, compared with women who had not breastfed (Chowdhury et al., 2015). In Taiwan, there is a high level of awareness of the

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Date submitted: June 28, 2017; Date accepted: February 2, 2018.

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benefits of breastfeeding; however, the rates of exclusive breastfeeding drop significantly from 68% and 62.3% at 1 month and 2 months postpartum, respectively, to 45.8% at 6 months postpartum (Health Promotion Administration, Ministry of Health and Welfare, & Taiwan, 2016).

During the postnatal period, women receive breastfeeding support from health professionals, including students, who provide the information that can impact women's breastfeeding decisions (McFadden et al., 2017). Nursing students need a strong educational foundation in evidence-based breastfeeding management to provide adequate support to breastfeeding women (Dodgson, Bloomfield, & Choi, 2014). There is research evidence supporting the notion that nursing students' attitudes and knowledge toward breastfeeding influence their effectiveness in breastfeeding promotion, and having a positive attitude toward breastfeeding increases health professional students' confidence when supporting mothers (Blackman, Sweet, & Byrne, 2015; Vandewark, 2014). Therefore, it is important to have a valid and reliable instrument to assess nursing students' attitudes toward breastfeeding, an instrument that is appropriate for assessing change following didactic theoretical and clinical learning experiences.

Several instruments have been used across different cross-cultural settings to measure the breastfeeding knowledge and attitudes of health professional students or other participants. One of these is the Australian Breastfeeding Knowledge and Attitude Questionnaire (ABKAQ), designed to measure breastfeeding knowledge and attitudes of health professionals (Brodribb, Fallon, Jackson, & Hegney, 2008). The ABKAQ consists of 60 items: a 20-item attitude subscale and a 40-item knowledge subscale. The 20 attitude items were selected for inclusion from a 33-item breastfeeding attitude scale used by Scott, McInnes, Tappin, and Guthrie (2003) studying midwives in Scotland, 12 items of which were similar to items used in the Iowa Infant Feeding Attitude Scale for parents (de la Mora, Russell, Dungy, Losch, & Dusdieker, 1999). Although the 40-item knowledge subscale has an additional "don't know" category, the response format to the 20-item attitude subscale used a 5-point Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5). Content validity of this 60-item scale was assessed by three medical professionals with breastfeeding expertise working in primary care and a researcher with breastfeeding education experience (Brodribb et al., 2008). The reliability of this tool in assessing breastfeeding knowledge and attitude was high; Cronbach's alpha was 0.83 and 0.84, respectively (Brodribb et al., 2008). However, factorial validity of the subscales of the ABKAQ has not yet been reported in any of the previous studies. The ABKAQ has been used in a number of studies for assessing breastfeeding knowledge and attitudes of health professionals or nursing students (Ahmed & El Guindy, 2011; Brodribb et al., 2008; Davis & Sherrod,

### Key Messages

- Assessing breastfeeding attitudes of nursing students is important because their beliefs can influence how they support breastfeeding initiation and maintenance.
- The content and factorial validity, reliability, and responsiveness of the Chinese version of the 18-item Australian Breastfeeding Attitude Questionnaire were evaluated in a group of Asian nursing students.
- The revised 12-item Australian Breastfeeding Attitude Questionnaire (ABAQ12) was able to detect positive attitudinal change toward breastfeeding associated with clinical placement experience.
- The Chinese version of the ABAQ12 is valid, reliable, and suitable for assessing the breastfeeding attitudes among nursing students.

2015; Srinivasan, Graves, & D'Souza, 2014; Vandewark, 2014). Although breastfeeding attitudes and knowledge are often assessed jointly, it is important to note that they are two distinct constructs; attitude is related to the affective domain and knowledge is related to the cognitive domain (Casal, Lei, Young, & Tuthill, 2017).

In this study, we aimed to examine (a) the psychometric properties of the Chinese version of the attitude component of the ABKAQ–Short Form (ABAQ) and (b) group differences and responsiveness of the Chinese version of the revised 12-item Australian Breastfeeding Attitude Questionnaire (ABAQ12) among nursing students in Taiwan.

## Methods

### Design

Using a prospective two-cohort survey design that had a cross-sectional and a longitudinal component, nursing students ( $N = 205$ ) in Year 2 ( $n = 97$ ) and Year 3 ( $n = 108$ ) of a 4-year bachelor of nursing program were surveyed in mid-May to December 2016. Ethical clearance was received from the University Human Research Ethics Committee prior to the initial data collection.

### Setting

We conducted the survey for this study at a private university in Southern Taiwan. The usual annual intake of baccalaureate nursing students at the time of the study was approximately 110. The theoretical education (didactic and skills laboratory) of the breastfeeding module was presented as a core component of a full semester subject pertaining to maternal and child nursing in the 2nd year of



a 4-year bachelor of nursing curriculum. The breastfeeding module comprised 3 hr of face-to-face didactic teaching (e.g., breastfeeding benefits, physiology of lactation, factors that affect breastfeeding, and management of common problems with breastfeeding) and 6 hr of practical skills in the skills laboratory (e.g., assessment of breast, techniques for expressing human milk by hand/pump, strategies for human milk storage, and positions for breastfeeding).

### Sample

Two cohorts of nursing students were sampled for this study. The first cohort included Year 2 students who had completed the theoretical breastfeeding education module, 2 weeks prior to the survey in mid-May 2016. The second cohort, surveyed at the same time to examine retention of this learning 10 months after the introduction of this breastfeeding education module, included Year 3 students who had completed the theoretical education 10 months prior to the survey. Of the 215 enrolled students, 205 (95.3% response rate) nursing students completed and returned the questionnaire. All surveys were fully completed with no missing data; hence, they were all included for data analysis. Additionally, only the Year 3 cohort was resurveyed following their exposure to breastfeeding women during their clinical practice experience in December 2016. This sample size met the required five subjects per item criterion for adequate factor analysis (Tabachnick & Fidell, 2013).

### Measurement

In the most recent iteration of the ABKAQ, Brodribb et al. (2008) developed the 38-item Australian Breastfeeding Knowledge and Attitude Questionnaire–Short Form (ABKAQ-SF) tool, which consists of an 18-item attitude component (ABAQ) with a 5-point Likert-type scale response format. In accordance with previously established procedures of psychometric testing (Parahoo, 2014), we assessed the content validity, construct validity, and internal consistency of the attitude component of the ABKAQ-SF instrument (ABAQ). Of the 18 items of the ABAQ, 14 items are negatively worded and, hence, were reverse scored, with higher scores indicating a more positive attitude toward breastfeeding.

To establish cross-cultural validation, two nursing academics, proficient in both Chinese and English, were used to translate the English version of the ABAQ into Chinese. Following completion of this translation, two different and independent bilingual experts back-translated the Chinese version of the ABAQ into English. Any discrepancies in the forward and backward translations were discussed until agreement was achieved regarding the most accurate translation of each item (Råholm, Thorkildsen, & Löfmark, 2010).

### Data Collection

In mid-May to December 2016, Year 2 and 3 nursing students who were enrolled in the maternal and child nursing subject were invited to participate in the study. Prior to administration of the survey, the students were provided with written and verbal information about the study by the tutor, which included an information sheet detailing anonymity and the voluntary nature of participation. They were also informed that noninvolvement in the study would not affect their academic performance or would not have any impact on their relationship with staff or the university. The first author then provided the tutor with hard copies of the survey for each consenting student to complete in class. All collected data were scanned and securely stored on a locked, password-protected computer. The hardcopies were stored in a locked filing cabinet in the first author's office.

### Data Analysis

To ensure that the Chinese version of the ABAQ was valid and culturally appropriate, a panel of six experts in the area of breastfeeding education was invited to evaluate the content validity of the Chinese version of the ABAQ. Each expert was asked to rate each attitude item on a 4-point ordinal scale from *highly relevant* to *not relevant* (4 = highly relevant, 3 = quite relevant, 2 = somewhat relevant, 1 = not relevant). Upon obtaining the results, we computed the content validity index (CVI) based on the expert ratings of item relevance (Lynn, 1986).

Data were analyzed using IBM-SPSS and IBM-AMOS (version 24) software. We calculated the average interitem correlation, corrected item-total correlation, and Cronbach's alpha to assess the internal consistency and reliability of the ABAQ. We also assessed the construct validity of the ABAQ by testing factor validity, group differences, and responsiveness.

Factorial validity was analyzed by two main factor analytic techniques: exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Data collected from the Year 2 nursing students were subjected to EFA to test the latent structure of the instrument. EFA is an extremely common tool to examine an instrument's dimensionality and to gather information about the interrelationships among a set of variables (Finch, Immekus, & French, 2016; Pallant, 2013). To assess for suitability of the 18-item ABAQ for factorability, Bartlett's test of sphericity (Bartlett, 1954) and the Kaiser-Meyer-Olkin measure of sampling adequacy (Kaiser, 1974) were used. Items were deleted based on (a) average interitem correlation (< 0.2), (b) corrected item-total correlation (< 0.35), and (c) factor loading (< 0.3; Peterson, 2000; Tabachnick & Fidell, 2013).

Factor structure of retained items were tested using CFA, which is the preferred factor analytic approach to formally test an instrument's dimensionality, when existing theory and empirical evidence support a particular latent structure

**Table 1.** Characteristics of the Sample ( $N = 205$ ).

Characteristic	$n$ (%)
Sample of year enrolled	
Year 2	97 (47)
Year 3	108 (53)
Gender	
Male	31 (15)
Female	174 (85)
Country of birth	
Taiwan	201 (98)
China	3 (1.5)
Macau	1 (0.5)
Breastfed as a child	
Yes	83 (40)
No or don't know	122 (60)
Prior experience with breastfeeding	
No	172 (84)
Yes	33 (16)
Observed women breastfeeding in public place	
Yes	93 (45)

of the data (Finch et al., 2016). We performed CFA of the retained items of the ABAQ on the Year 2 and 3 nursing students to test a hypothesized model for goodness of fit. Fit indices selected in this study were chi-square, root mean square error of approximation (RMSEA), goodness-of-fit index (GFI), comparative fit index (CFI) and Tucker-Lewis index (TLI). Based on the standards suggested by Byrne (2013), values of GFI, CFI, and TLI of  $> 0.9$  and RMSEA of  $< 0.06$  suggest good model fit. We also used the modification procedure as recommended by Hopko et al. (2003) to improve model fit by controlling error terms that can be theoretically justified.

Group differences were performed in the retained ABAQ scores by sociodemographic factors (e.g., age, gender, prior experience with breastfeeding, being breastfed by their mother as a child, and observing women breastfeeding in public). Scale responsiveness was assessed using Wilcoxon signed-ranks test to examine the mean change in the retained ABAQ scores.

## Results

The overall mean (standard deviation) age of the respondents was 21.2 (1.4) years (range = 20-31), and all respondents were single and without children. The mean (standard deviation) score of self-reported confidence in providing breastfeeding support was 6.98 (1.55) out of 10 points after receiving theoretical education. Table 1 summarizes the characteristics of the study sample.

### Study Aim 1: Psychometric Analysis of ABAQ

**Content validity.** The calculated item-level content validity index (I-CVI) of all 18 items of the ABAQ ranged between

0.83 and 1.00, and the scale-level content validity index (S-CVI) of these items was 0.99. This was above the minimum I-CVI threshold of 0.78 for 6 to 10 experts, and above the S-CVI threshold of 0.9 (Polit & Beck, 2006). Both I-CVI and S-CVI results indicate adequate content validity of the ABAQ.

**Internal consistency and exploratory factor analysis.** Cronbach's alpha of the 18-item ABAQ, computed using the Year 2 nursing student sample ( $n = 97$ ), was 0.76. Inspection of the correlation matrix table and item-total statistics revealed that the average interitem correlation of each item ranged from 0.06 to 0.34, and all corrected item-total correlations were positive, ranging from 0.002 to 0.651 (see Table 2).

Students in the Year 2 sample ( $n = 97$ ) were subjected to EFA of the ABAQ. The Kaiser-Meyer-Olkin measure of sampling adequacy value was 0.72, exceeding the minimum value of 0.6 (Kaiser, 1974), and Bartlett's test of sphericity value was less than 0.05, indicating that the variables were sufficiently correlated for EFA (Bartlett, 1954). Using the principal axis factoring procedure for EFA, the number of factors to be extracted was decided using Cattell's scree test criterion and not the more commonly used rule of eigenvalue greater than 1 (Tabachnick & Fidell, 2013). This was because of low correlation among some items. An inspection of the scree plot revealed a clear break after the first component, supporting a one-factor solution. Although the three- or four-factor solutions were also computed, the most parsimonious solution and best fit for the data in this study was the one-factor solution.

Table 2 displays the factor loadings of the one-factor solution of the 18-item ABAQ, which accounted for a total variance of 20.72%. Six items (Items 3, 4, 7, 10, 12, and 15) of the scale did not meet the minimum threshold value for average interitem correlation ( $< 0.2$ ), corrected item-total correlation ( $< 0.35$ ), and factor loading ( $< 0.3$ ) threshold and, thus, were deleted to form the revised Chinese version of the ABAQ12. With the deletion of the six items, the Cronbach's alpha of the remaining 12 items increased from 0.76 to 0.81.

**Confirmatory factor analysis.** The CFA of the 12 retained items (ABAQ12), using the Year 2 and 3 sample ( $n = 205$ ), indicated an acceptable fit to a one-factor solution. All paths to the 12 items were statistically significant at the 5% level, with standardized factor loadings ranging from 0.34 to 0.75. Fit statistics for this one-factor model without controlling for error terms were suboptimal ( $\chi^2 = 178.194$ ,  $df = 54$ ,  $p < 0.05$ ; GFI = 0.868, TLI = 0.683, CFI = 0.74, RMSEA = 0.106); however, controlling for error terms, the fit indices significantly improved ( $\chi^2 = 63.702$ ,  $df = 47$ ,  $p = .053$ ; GFI = 0.949, TLI = 0.951, CFI = 0.965, RMSEA = 0.042). Figure 1 shows the 12-item unidimensional structure of the ABAQ12 in the CFA model.



**Table 2.** 18-Item Australian Breastfeeding Attitude Questionnaire.

Item	Question	Average interitem correlation (< 0.2)	Corrected item-total correlation (< 0.35)	Loading for one-factor solution (< 0.3)
1R	Infant formula is more easily digested than breast milk.	0.26	0.435	0.539
2	Breast milk is the ideal food for babies.	0.28	0.471	0.623
3R <sup>a</sup>	Formula feeding is a good way of letting fathers care for the baby.	0.17	0.255	0.287
4R <sup>a</sup>	Breastfeeding & formula feeding are both equally acceptable methods of feeding infants.	0.16	0.240	0.273
5	Breastfeeding increases mother–infant bonding.	0.27	0.433	0.602
6	Breastfeeding provides health benefits for infants that cannot be provided by infant formula.	0.25	0.375	0.543
7R <sup>a</sup>	Mothers who smoke should formula feed their babies.	0.18	0.279	0.262
8R	Breastfeeding is incompatible with working outside the home.	0.24	0.419	0.458
9R	Fathers feel left out if a mother breastfeeds.	0.24	0.422	0.447
10R <sup>a</sup>	Breastfed babies need to be fed too often.	0.06	0.002	0.018
11R	Infant formula is as healthy for an infant as breast milk.	0.23	0.400	0.461
12 <sup>a</sup>	Breastfeeding is more convenient than formula feeding.	0.07	0.023	0.083
13R	Formula feeding is the better choice if the mother plans to go out to work.	0.22	0.382	0.339
14R	The benefits of breast milk last only as long as the baby is breastfed.	0.23	0.416	0.423
15R <sup>a</sup>	A mother who occasionally drinks alcohol should not breastfeed her baby.	0.19	0.317	0.277
16R	Formula feeding is more reliable because you can calculate the exact quantity of milk the baby is getting.	0.26	0.469	0.497
17R	Current infant formulas are nutritionally equivalent to breast milk.	0.34	0.651	0.745
18R	Women should not breastfeed in public places such as restaurants.	0.28	0.495	0.607

Note. R = reverse-scored items.

<sup>a</sup>Item was deleted.

### Study Aim 2: Group Differences and Responsiveness of the ABAQ12

There were no sociodemographic group differences in ABAQ12 scores; however, those who reported being breastfed by their mother as a child had higher ABAQ12 scores (4.06 vs. 3.94,  $p = .038$ ) compared with their counterparts.

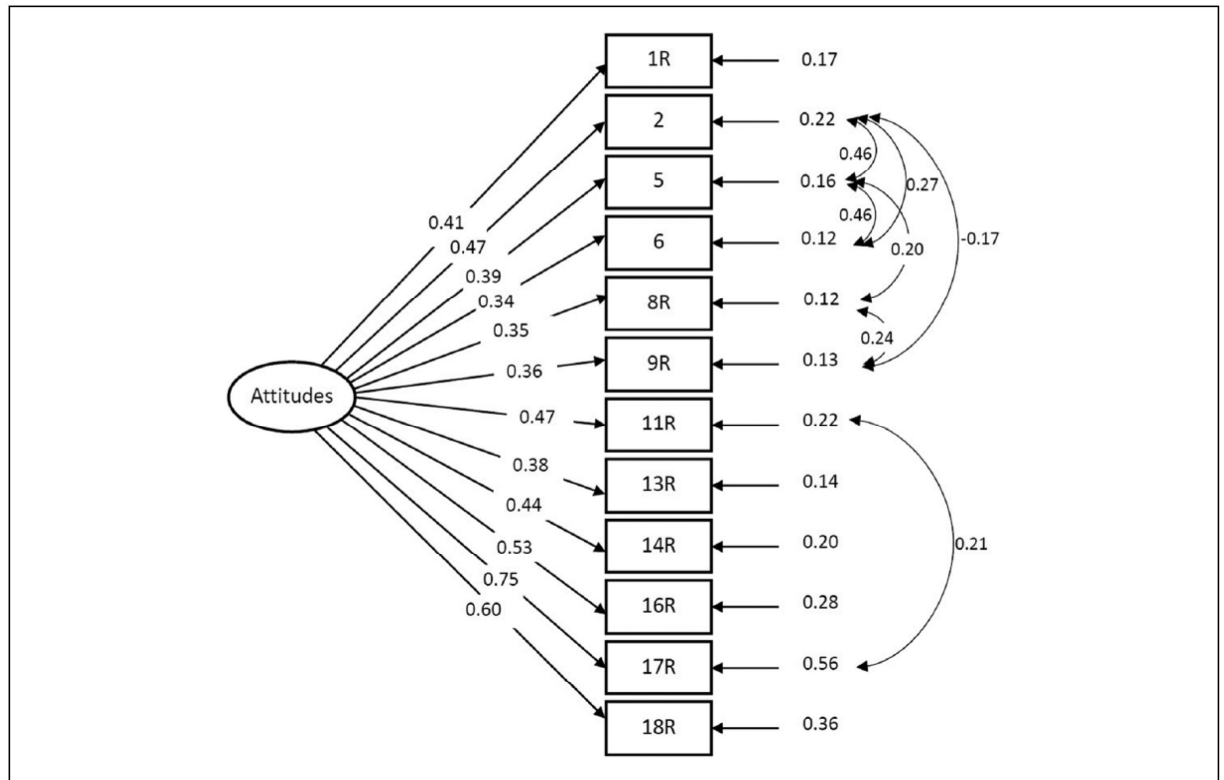
The overall preclinical placement mean (standard deviation) ABAQ12 score was 3.99 (0.45) for Year 2 and 3 cohorts, with no significant difference at baseline. However, the follow-up mean (standard deviation) ABAQ12 score for the Year 3 cohort postclinical placement was 4.20 (0.49), indicating a positive change in breastfeeding attitude, as reflected by the ABAQ12 score ( $p < .001$ ).

### Discussion

This is the first study in an Asian country to evaluate the psychometric properties of the Chinese version of the

18-item ABAQ. Except for six items (Items 3, 4, 7, 10, 12, and 15) of the ABAQ, the revised 12-item version (ABAQ12) had acceptable corrected item-total correlation and average interitem correlation and indicated good overall model fit. This revised tool (ABAQ12) was able to detect change in attitude toward breastfeeding following clinical learning experience, during clinical placement, among nursing students in the Taiwanese higher education setting.

The deleted six attitude items in this study were items that were not common social practices, nor were they aligned with the common cultural beliefs of Taiwanese people. For example, the items related to mothers who smoke or drink alcohol were not relevant in the Taiwanese sociocultural context because of the very low prevalence (2.2%-2.7%) of these behaviors among Taiwanese women (Wang & Billings, 2015). Other deleted items (e.g., formula feeding is convenient for fathers) also appeared to hold little relevance in Taiwanese culture, in which other family members care for



**Figure 1.** One-factor confirmatory factor analysis solution of the hypothesized model of the revised Chinese version of the 12-item Australian Breastfeeding Attitude Questionnaire.

the infant. Researchers reported that in Taiwan, as in many Asian cultures, the woman’s mother (47.2%) and mother-in-law (35.6%) were the key family members who would help to care for the newborn during the postpartum period, especially when mothers returned to work (Feng & Han, 2010; Wang & Billings, 2015). Therefore, it is important for health professionals to learn to give the appropriate breastfeeding information to family members who are involved in maintaining the breastfeeding relationship.

Background was an important factor in health professional students’ attitudes toward breastfeeding. We found that health professionals with more breastfeeding-related experiences were more likely to have positive attitudes toward breastfeeding, which is similar to the findings of other researchers (Brodrribb et al., 2008; Marks & O’Connor, 2015). It would be useful to measure the ABAQ in future studies, with a larger sample of nursing students or other health professional students in different study settings, as this may present stronger evidence of the psychometric properties of this scale. Researchers using the ABAQ could consider including a question related to support from grandmothers rather than fathers, as this may be culturally appropriate in nonnuclear families.

**Limitations**

There were some limitations in this study. The study sample consisted of nursing students from a single university in Taiwan; the study findings are not generalizable to or representative of all Taiwanese nursing students. Of the 18-item ABAQ, 14 are negatively worded items. Although reverse-coded items in questionnaires are important and may implicitly correct for acquiescence or agreement bias (Weijters & Baumgartner, 2012), some experts have argued against the use of reversed items in measurement scales, suggesting that reversed items may be more confusing or difficult to process than nonreversed items (DeVellis, 2017).

**Conclusion**

The Chinese version of the revised 12-item ABAQ12 is valid, reliable, and responsive; therefore, it was suitable for assessing the breastfeeding attitudes of nursing students in the Taiwanese higher education context. The generalizability of the findings compared with other Chinese-language-speaking regions needs to be further examined in future studies.



### Acknowledgments

We wish to thank all nursing students who participated in this research.

### Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

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# **Chapter 5: Breastfeeding Knowledge and Attitudes of Baccalaureate Nursing Students in Taiwan: A Cohort Study**

## **5.1 Publication (Paper 3)**

Yang, S.-F., Schmied, V., Burns, E., & Salamonson, Y. (2019). Breastfeeding knowledge and attitudes of baccalaureate nursing students in Taiwan: A cohort study. *Women and Birth*, 32(3), e334–e340.  
doi:10.1016/j.wombi.2018.08.167 (Impact Factor: 2.079)

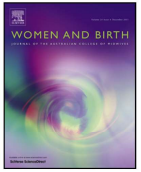
## **5.2 Relevance to the Thesis**

It is essential that health professional students have a positive attitude towards breastfeeding and are able to provide breastfeeding women with the basic information and support they require. Paper 3 presents the results of the quantitative study, which determined the effectiveness of breastfeeding education in a BN program on Taiwanese nursing students' knowledge and attitude towards breastfeeding. Prior to theoretical education, the study found that students who had experience with close family members being breastfed indicated higher breastfeeding knowledge. Following both theoretical and clinical education, there was a statistically significant improvement in both knowledge and attitude scores.



Contents lists available at ScienceDirect

Women and Birth

journal homepage: [www.elsevier.com/locate/wombi](http://www.elsevier.com/locate/wombi)

## Breastfeeding knowledge and attitudes of baccalaureate nursing students in Taiwan: A cohort study

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### ARTICLE INFO

#### Article history:

Received 16 May 2018

Received in revised form 17 August 2018

Accepted 21 August 2018

#### Keywords:

Breastfeeding

Breastfeeding knowledge

Breastfeeding attitudes

Nursing students

Breastfeeding education

### ABSTRACT

**Background:** Optimal nutrition during the first year of life is critical to infants' healthy growth and development. Hence, it is vital that undergraduate health professional curricula provide good quality learning environments to enable students to acquire the necessary knowledge and skills to support breastfeeding mothers.

**Aims:** To examine the change in knowledge and attitude in Taiwanese nursing students following theoretical and clinical learning experiences on breastfeeding.

**Methods:** This study used a pre-test/post-test survey design with two cohorts of nursing students ( $N=215$ ). Knowledge and attitude were assessed before and after: (a) theoretical (didactic and skills laboratory) education in Cohort One, and (b) clinical placement in Cohort Two.

**Findings:** Students in both cohorts demonstrated significant improvements in knowledge and attitude post-theoretical education, and post-clinical placement. Prior to theoretical education in Cohort One, those with experience of close family members being breastfed were more than 14 times (adjusted odds ratio: 14.09, 95% confidence interval: 1.73–114.64) to be in the high knowledge group. However, following theoretical or clinical education, there were no sociodemographic group differences in breastfeeding knowledge or attitude in Cohorts One or Two.

**Conclusion:** Results revealed that the current breastfeeding education program in Taiwan, both theoretical and clinical components, increased nursing students' knowledge and improved positive attitudes towards breastfeeding, and any sociodemographic differences in knowledge and attitude about breastfeeding were ameliorated following theoretical and clinical placement experience focused on breastfeeding.

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Statement of significance

#### Problem or issue

Breastfeeding education is important for nursing students in Taiwan and other countries that do not train and employ registered midwives but few studies have explored the effectiveness of theoretical and clinical education.

#### What is already known

Nursing students can benefit from targeted programs to increase breastfeeding knowledge to support women to breastfeed. However, it remains unclear if breastfeeding educational programs improve attitudes amongst nursing students.

#### What this paper adds

The current breastfeeding education program in Taiwan, both theoretical and clinical components, improved nursing students' knowledge and attitude towards breastfeeding. Furthermore, theoretical and clinical placement experience ameliorated any prior sociodemographic group differences in knowledge and attitude about breastfeeding.

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<https://doi.org/10.1016/j.wombi.2018.08.167>

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## 1. Introduction

Optimal nutrition during the first year of life is critical to infants' healthy growth and development. To promote the health and optimal growth of infants and children, both the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) recommend that infants should be exclusively breastfed for the first six months of their life, and continue breastfeeding, with the introduction of appropriate complementary foods, for two years or more.<sup>1</sup>

Recent reviews indicate that there is extensive research on the quality of breastfeeding support that women receive in health services, particularly in hospital based postpartum care, and many women are dissatisfied with the experience of breastfeeding support, and the information they receive.<sup>2–4</sup> To ensure that mothers receive accurate information and support and encouragement for breastfeeding in hospital, and in the community, a number of initiatives have focused on the education of health professionals in the hope that this will assist in extending the duration of breastfeeding.<sup>5,6</sup> Thus, the emphasis on health professional education is core to the global strategy on infant feeding. It is important to provide adequate breastfeeding education to students, both didactic and experiential learning, so that they will be better able to provide mothers with effective and positive breastfeeding support.<sup>7,8</sup> Globally, midwives provide the majority of support to breastfeeding and breastfeeding education is a core part of the midwifery curriculum. However, in countries such as the United States and many Asian countries, registered nurses provide maternal and infant care but in general receive less education about breastfeeding.<sup>9,10</sup> This paper reports the findings of a study that examined the effects of theoretical and clinical learning experience on Taiwanese nursing students' knowledge and attitude towards breastfeeding.

## 2. Background

### 2.1. Breastfeeding in Taiwan

In 1991, the WHO and UNICEF launched the Baby-Friendly Hospital Initiative (BFHI) and the Ten Steps to Successful Breastfeeding to improve the initiation and continuation of breastfeeding.<sup>11</sup> The Bureau of Health Promotion, of Taiwan Department of Health, began to advocate the Ten Steps to Successful Breastfeeding in 1991, and this was followed by the national accreditation system using WHO standards, to build a breastfeeding friendly environment for mothers to increase the breastfeeding rates.<sup>12</sup> In 2001, there were 38 (39%) medical institutions certified as a Baby-Friendly hospital in Taiwan. By the end of 2016, 187 (79%) maternity facilities had met the national accreditation requirements.<sup>12</sup> With this substantial effort from the Taiwanese health services to promote and support breastfeeding, the rate of exclusive breastfeeding for infants less than one month after birth has increased from 46.6% in 2004 to 68% in 2014. Furthermore, the rate of exclusive breastfeeding under six months doubled from 24% in 2004 to 45.8% in 2014.<sup>13</sup> Although the initiation of breastfeeding among Taiwanese women is common, to maintain and improve this rate, health professionals need to be adequately prepared to support mothers to breastfeed.

### 2.2. Nursing education and maternity care in Taiwan

The baccalaureate nursing education program in Taiwan is a 4-year program. Upon graduation, nursing students are eligible to take the national examination to secure the licensure as a Registered Nurse. Registered nurses can elect to work in maternity units. Currently there are only two midwifery programs in Taiwan,

established in 1999 and 2000 respectively at two universities. One is a masters-degree program and the other is a two-year college level program.<sup>14</sup> Graduates of these programs are eligible to register as midwives in Taiwan but not registered nurses, and it is registered nurses who are the principal healthcare professionals providing postpartum care to mothers.

In Taiwan, most pregnant women opt for an obstetrician to provide their maternity care, and plan to give birth in hospital.<sup>15</sup> In 2016, a total of 99.87% of births were with obstetricians and assisted by nurses, and only 0.07% of babies were born with midwives' assistance.<sup>16</sup> Registered nurses working in the maternal-child unit assist obstetricians in providing care for women during the: (i) antenatal period; (ii) labour and childbirth; and (iii) postpartum period including and caring for the newborn. Hence, nursing students in the baccalaureate program in Taiwan need to be adequately prepared to assist families with breastfeeding, which occurs in the Maternal-Child Nursing subject.

### 2.3. Knowledge about breastfeeding

Knowledge about breastfeeding includes an understanding of information related to human milk feeding, benefits, barriers and enablers, as well as valuing breastfeeding as important.<sup>17</sup> Implementation guidelines for the Ten Steps to Successful Breastfeeding state that all health care providers should receive breastfeeding education including both the knowledge and skills to support women to breastfeed.<sup>1</sup> Research reports that education of nursing students is associated with a higher level of breastfeeding knowledge as well as increased breastfeeding rates.<sup>18</sup> To assess breastfeeding knowledge, the subject areas covered in these studies included differences in breastfeeding and formula feeding outcomes, basic lactation science concepts, assessing the adequacy of breastfeeding, maternal conditions that may affect breastfeeding, and common breastfeeding problems.<sup>6,19,20</sup> Researchers in the US and UK, have also reported that purposively designed educational program can be effective in increasing nursing students' knowledge about the benefits and nutritional value of breastfeeding.<sup>21,22</sup> A number of studies also highlight the gaps in breastfeeding education for nursing students.<sup>7,8,23</sup> For example, a study by Ahmed and El Guindy<sup>8</sup> in Egypt highlighted the need for extensive improvement in breastfeeding education in the baccalaureate nursing curriculum including more in-depth and focused breastfeeding content in class. Researchers recommend that nursing and medical students' require regular instruction and teaching about successful breastfeeding and reinforcement of knowledge related to breastfeeding.<sup>23</sup>

### 2.4. Attitude towards breastfeeding

A mother's attitude towards breastfeeding has been found to be an important determinant of breastfeeding behaviour, and is a consistent predictor of breastfeeding initiation and duration.<sup>24</sup> Studies reported that women who had a positive attitude towards breastfeeding had extended length of exclusive breastfeeding time.<sup>25</sup> Health professionals play an important role in influencing breastfeeding behaviours through supporting mothers, and their own knowledge and attitude can also influence nursing mothers' disposition towards breastfeeding.<sup>26</sup> Studies in the USA, Egypt and Australia, have examined the breastfeeding attitudes amongst health professionals, including nursing and midwifery students, and found that previous experience, prior to commencement of their nursing studies, influences the development of breastfeeding attitudes and beliefs.<sup>8,19</sup> cultural factors and individual experiences also impact.<sup>27,28</sup> Therefore, it is critical to determine effective the pedagogical approaches in breastfeeding education that improve breastfeeding attitudes and beliefs amongst health professionals,



including obstetricians, paediatricians, midwives, nurses, lactation consultants.<sup>27</sup>

To date, no studies have examined the knowledge and attitudes towards breastfeeding among baccalaureate nursing students in Taiwan. It is important that nursing students in Taiwan receive effective breastfeeding education so that they can provide optimal support for breastfeeding women, particularly supporting women to continue breastfeeding when they return to work.

### 2.5. Study aim and objectives

The aim of this study was to examine the effect of theoretical and clinical learning experiences, related to breastfeeding, on Taiwanese nursing students' knowledge and attitude towards breastfeeding. Specific objectives addressed were:

1. To report the Taiwanese nursing students' knowledge level of supporting breastfeeding initiation and maintenance before and after theoretical and clinical education.
2. To report the attitudes of Taiwanese nursing students towards breastfeeding before and after theoretical education and clinical learning experience.
3. To determine the sociodemographic factors that influence nursing students' knowledge and attitudes towards breastfeeding before and after theoretical education and clinical placement.

## 3. Methods

### 3.1. Study design

This study used a pre-test/post-test survey design with two cohorts of nursing students ( $N=215$ ) to determine the impact of theoretical education and clinical placement on nursing students' breastfeeding knowledge and attitudes. The survey and study design were conducted according to the "Strengthening of Reporting of Observational Studies in Epidemiology" (STROBE) guidelines.<sup>29</sup>

### 3.2. Setting

The researchers conducted the survey for two cohorts of nursing students from May 2016 to May 2017 at a private university in southern Taiwan. The Chinese version of the survey was administered to two cohorts of consenting nursing students before and after the theoretical and clinical learning experiences.

#### 3.2.1. Curriculum related to breastfeeding

The baccalaureate nursing education in Taiwan is a 4-year program. The Maternal and Child Nursing subject (didactic and laboratory-based skills) contained a breastfeeding module offered in the second year, which consisted of a 3-hour on-campus theoretical learning, with six hours of laboratory-based skills

learning on breastfeeding. The laboratory-based skills component of the learning included assessment of the breast, techniques for expressing breast milk (by hand/pump), strategies for breast milk storage, and breastfeeding attachment and positioning. The Maternal and Child Nursing clinical placement has a block of time focused on antenatal care, childbirth and postnatal care, which occurs in the last year of the program. Nursing students spend approximately one week (40 h) in the postnatal unit and gain experience in breastfeeding support and management of maternal issues, such as nipple pain, mastitis, insufficient breast milk supply and return to work.

### 3.3. Participants

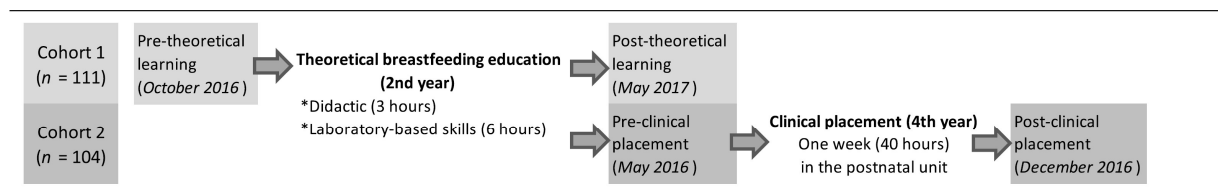
Two cohorts of nursing students enrolled in the Maternal and Child Nursing subject/clinical placement, were invited to participate in the survey data collection. Cohort One ( $n=111$ ) comprised second year students, who were surveyed before and after theoretical breastfeeding education (pre-theory: October 2016 and post-theory: May 2017). Cohort Two ( $n=104$ ) were surveyed after theoretical breastfeeding education but prior to clinical placement in their third year (pre-clinical: May 2016), and again following their experience of supporting breastfeeding women during their clinical placement in their fourth year of education (post-clinical: December 2016). The data collection for both cohorts is shown in Table 1.

Prior to administration of the survey, the students were provided with written and verbal information about the study by the tutor, which included an information sheet detailing anonymity and the voluntary nature of participation. They were also informed that if they chose not to participate in the study it would not affect their academic performance nor have any impact on their relationship with staff or University. The first author provided the tutors with hard copies of the survey for each consenting student to complete in class. In total, 215 participants completed both the pre and post-survey questionnaire, indicating a response rate of 96.4% (215/223).

### 3.4. Measurement

The Australian Breastfeeding Knowledge and Attitude Questionnaire Short-Form (ABKAQ-SF) consists of a 20-item Knowledge subscale (ABKQ20) and an 18-item Attitude subscale (ABAQ).<sup>6</sup> In order to conduct the cross-cultural study in Taiwan, permission was sought to use the questionnaire from Dr. Wendy Brodribb, who originally developed the ABKAQ-SF. The English version of ABKAQ-SF, was translated into Chinese by two nursing experts, proficient in both English and Chinese. Following this forward translation, the Chinese version of the ABKAQ-SF was backward translated into English by two independent bilingual experts. Any discrepancies in the forward and backward translations were discussed until agreement was achieved regarding the best translation of each item following the guidelines suggested by Råholm et al.<sup>30</sup>

**Table 1**  
Data collection for two cohorts.



In this study, nursing students' knowledge and attitudes towards breastfeeding were measured by the Chinese version of the 20-item Australian Breastfeeding Knowledge Questionnaire (ABKQ20) and the revised 12-item Australian Breastfeeding Attitude Questionnaire (ABAQ12) of ABKAQ-SF<sup>6,31</sup> (see Table 2). In addition to the standardised scales, key demographic questions were asked including participants age, gender, exposure to breastfeeding in their family of origin or in the community and their perceptions of public breastfeeding.

#### 3.4.1. 20-item Australian Breastfeeding Knowledge Questionnaire (ABKQ20)

The 20-item Breastfeeding Knowledge Questionnaire uses 'correct-incorrect' and a 'don't know' category. Of the 20 Knowledge items, 11 are incorrect items. Each correct answer was given one point, incorrect and don't know answer were given zero point. Total knowledge scores ranged from zero to 20, with higher scores indicating better knowledge about breastfeeding.

#### 3.4.2. Revised 12-item Australian Breastfeeding Attitude Questionnaire (ABAQ12)

The ABAQ12 is a revised version of the ABAQ. The scale uses a 5-point Likert scale response format that ranges from strongly disagree (1) to strongly agree (5). Of the 12 items of ABAQ12, nine are negatively worded items. Possible scores on the ABAQ12 ranged from one to 5, with higher scores indicating more positive attitude towards breastfeeding.

#### 3.5. Data analysis

Survey data were analysed using IBM-SPSS Version 24.0. Descriptive statistics including frequency, percentage, means, and standard deviation were computed. As the continuous scores were not normally distributed, group differences in pre- and post-test scores were examined using the non-parametric Wilcoxon signed ranks test.

The aggregate knowledge and attitude scores before and after theoretical education and clinical placement were dichotomised at the median to the "High" and "Low" knowledge and attitude groups. All statistical tests were two-tailed, and  $p$  value of  $<0.05$  was considered statistically significant. Multiple logistic regression analyses were used to predict the relationship between nursing students' characteristics associated with breastfeeding knowledge and attitude at each stage of breastfeeding learning (that is following theory and following clinical placement) in the nursing program. The independent variables included in the regression models were sociodemographic and other single-item questions related to breastfeeding (age, gender, exposure to breastfeeding in their family of origin, being breastfed by their mother as a child, and their perceptions of breastfeeding infants in public). The adjusted odds ratio (AOR) and 95% confidence intervals (95% CI), as well as Nagelkerke  $R^2$  and model-fits (Homer & Lemeshow test) were computed.

The main outcome was a small or median change in effect size regarding breastfeeding knowledge and attitude, with 80% power and a 5% significance level. As the self-report measures were

**Table 2**

The Australian breastfeeding knowledge and attitude questionnaire short-form (ABKAQ-SF).

20-item Australian Breastfeeding Knowledge Questionnaire (ABKQ20)
1. Breastfed infants require extra water in hot weather.*
2. It is expected that breastfed infants will regain their birth-weight by two weeks of age.
3. A breastfeeding woman should be advised to wean if she becomes pregnant.*
4. It is normal for an adequately breastfed 2-week old infant to only pass a bowel motion every 3 days or so.*
5. Women who have breastfed have a lower incidence of premenopausal breast cancer.
6. Amoxicillin is the drug of choice to treat mastitis in a woman 3 months postpartum.*
7. Breastfeeding is contraindicated for women with Hepatitis C.*
8. All women with cracked nipples should express their milk and rest the nipples for 24 h.*
9. Increasing her fluid intake will increase a mother's milk supply.*
10. High maternal prolactin levels are essential for the initiation of lactation.
11. Introducing complementary feeds (water or formula) interferes with the establishment of breastfeeding.
12. Antenatal nipple preparation prevents nipple soreness in the first week postpartum.*
13. A nipple shield should be used if there are any problems with the infant attaching to the breast.*
14. The nutritional content of breast milk changes throughout a breastfeed.
15. Formula fed infants have more ear infections than breastfed infants.
16. The most common cause of cracked nipples is poor positioning and attachment of the infant at the breast.
17. In most cases a breastfeeding mother must temporarily wean her baby while she is taking prescription medications.*
18. Growth of breastfed infants differs from that of formula fed infants.
19. A 'top-up' bottle after each breastfeed is the best way to manage an infant who is not gaining weight adequately.*
20. Only feeding from one breast at each feed is a management option for a woman with an oversupply of breast milk.
Note. *incorrect items.
Revised 12-item Australian Breastfeeding Attitude Questionnaire (ABAQ12)
1. Infant formula is more easily digested than breast milk.*
2. Breast milk is the ideal food for babies.
3. Breastfeeding increases mother-infant bonding.
4. Breastfeeding provides health benefits for infants that cannot be provided by infant formula.
5. Breastfeeding is incompatible with working outside the home.*
6. Fathers feel left out if a mother breastfeeds.*
7. Infant formula is as healthy for an infant as breast milk.*
8. Formula feeding is the better choice if the mother plans to go out to work.*
9. The benefits of breast milk last only as long as the baby is breastfed.*
10. Formula feeding is more reliable because you can calculate the exact quantity of milk the baby is getting.*
11. Current infant formulas are nutritionally equivalent to breast milk.*
12. Women should not breastfeed in public places such as restaurants.*
Note. *reverse-scored items.



ordinal, and likely to be skewed, we used non-parametric Wilcoxon-signed-rank test. Using the G\*Power statistical software, with an estimated 90% valid and completed survey data, a sample size of 103 respondents was required.

## 4. Results

### 4.1. Demographic characteristics

The overall mean age of the respondents was 20.51 years (*SD*: 1.30; Range: 19–28), with 44 (20.5%) males. Less than half ( $n = 86$ , 40.0%) reported that they were breastfed by their mother, and over half ( $n = 119$ , 55.3%) of respondents reported that they had not observed women breastfeeding in public places. The respondents were all single and without children, only 28 (13.0%) students reported that they had personal experience of close family members' breastfeeding. Details of sample characteristics are presented in Table 3.

### 4.2. The effect of theoretical education and clinical placement on breastfeeding knowledge and attitudes

There were significant increases in the mean knowledge and attitude scores post-theoretical education, and post clinical placement. Nevertheless, there were variations in the magnitude of change in knowledge and attitude pre- and post-theoretical education, and pre- and post-clinical placement (Fig. 1).

#### 4.2.1. Knowledge

Prior to theoretical breastfeeding education, the mean breastfeeding knowledge score in Cohort One was 5.35 (*SD* = 2.24), which increased to 7.58 (*SD* = 2.15) following theoretical education (29% increase). This change was statistically significant ( $p < 0.001$ ). Prior to clinical placement, the mean knowledge score of Cohort Two was 7.80 (*SD* = 2.37), which increased to 9.43 (*SD* = 2.47) following clinical placement (17% increase), and this knowledge improvement which was statistically significant ( $p < 0.001$ ).

#### 4.2.2. Attitude

Prior to receiving theoretical breastfeeding education, the mean breastfeeding attitude score in Cohort One was 3.69 (*SD* = 0.40), which increased to 3.89 (*SD* = 0.46) following theoretical education (5% increase). This change was statistically significant ( $p < 0.001$ ). Prior to clinical placement, the mean attitude score of Cohort Two was 3.99 (*SD* = 0.42), which increased to 4.20 (*SD* = 0.49) following

clinical placement (5% increase), and this change was statistically significant ( $p < 0.001$ ).

### 4.3. Sociodemographic factors

Prior to theoretical breastfeeding education in Cohort One, those with experience of close family members being breastfed were more than 14 times (AOR: 14.09, 95% CI: 1.73–114.64) more likely to be in the high knowledge group. However, following theoretical or clinical education experience, nursing students' demographic characteristics and previous exposure and experience regarding breastfeeding were not significantly different related to breastfeeding knowledge and attitude scores in both Cohorts One and Two.

## 5. Discussion

This study examined the effects of breastfeeding education in a baccalaureate nursing program on Taiwanese nursing students' knowledge and attitude towards breastfeeding. This study is important because previous studies undertaken in the USA, Australia, Egypt and UK, which have explored the impact of breastfeeding education for students have only collected data at one point in time.<sup>5–8,23</sup> Our findings revealed that nursing students' knowledge and attitudes towards breastfeeding were significantly increased following both theoretical, and clinical, learning experiences. This is consistent with results from three previous studies that have used a pre- and post- test design to assess breastfeeding education interventions for health professional students, reporting a significant increase in breastfeeding knowledge.<sup>18,20,32</sup> However, two studies testing the impact of educational programs on breastfeeding attitudes did not appear to have any effect.<sup>8,19</sup>

The guidelines for the Ten Steps to Successful Breastfeeding state that all health professionals should receive at least 20 h of breastfeeding education.<sup>1</sup> Furthermore, the Australian Baby-Friendly Hospital Initiative (BFHI) guidelines recommend that education programs training health professional students should provide at least eight hours theoretical instruction and at least three hours relevant supervised clinical experience breastfeed.<sup>33</sup> A systematic review<sup>34</sup> reported that specialised breastfeeding programs for nursing students varied from as little as two hours to 16 h of didactic lecture style or online computer based learning modules. In some but not all cases, this was supplemented by simulated role-play. The evaluation of these programs demonstrated varying impact on nursing students' breastfeeding knowledge and attitudes.<sup>34</sup>

As described, the education program addressing breastfeeding in this study consisted of three hours didactic learning, six hours of laboratory-based skills learning, plus one week (40 h) clinical placement in a postnatal unit. The theoretical instruction in this Taiwanese program (nine hours) aligns with the study by Dodgson and Tarrant<sup>32</sup> who demonstrated improvement in nursing students' level of knowledge related to breastfeeding by ten hours of face-to-face theoretical instruction and eight weeks of clinical placement.<sup>32</sup> Both studies reported the theoretical programs were effective in increasing nursing students' breastfeeding knowledge, and therefore it appears that around nine to ten hours of theoretical training program (both classroom and laboratory) may be sufficient for health professional students who are undertaking a program such as nursing or medicine.

In this study, logistic regression analysis revealed that the breastfeeding knowledge score prior to theoretical education on breastfeeding was significantly associated with nursing students' prior experience or exposure to breastfeeding. Similar findings were reported by Brodribb et al., Darwent and Kempenaar and

**Table 3**  
Characteristics of the sample ( $N = 215$ ).

Variable	
Sample of cohort, $n$ (%)	
Cohort 1	111 (51.6)
Cohort 2	104 (48.4)
Age, mean [median]	
Cohort 1 (range: 19–23)	19.51 [19]
Cohort 2 (range: 21–28)	21.58 [21]
Gender, $n$ (%)	
Male	44 (20.5)
Female	171 (79.5)
Were breastfed by their mother as a child, $n$ (%)	
Yes	86 (40.0)
No or don't know	129 (60.0)
Prior experience with close family members were breastfed, $n$ (%)	
No	187 (87.0)
Yes	28 (13.0)
Observed women breastfeeding in public place, $n$ (%)	
No	119 (55.3)
Yes	96 (44.7)

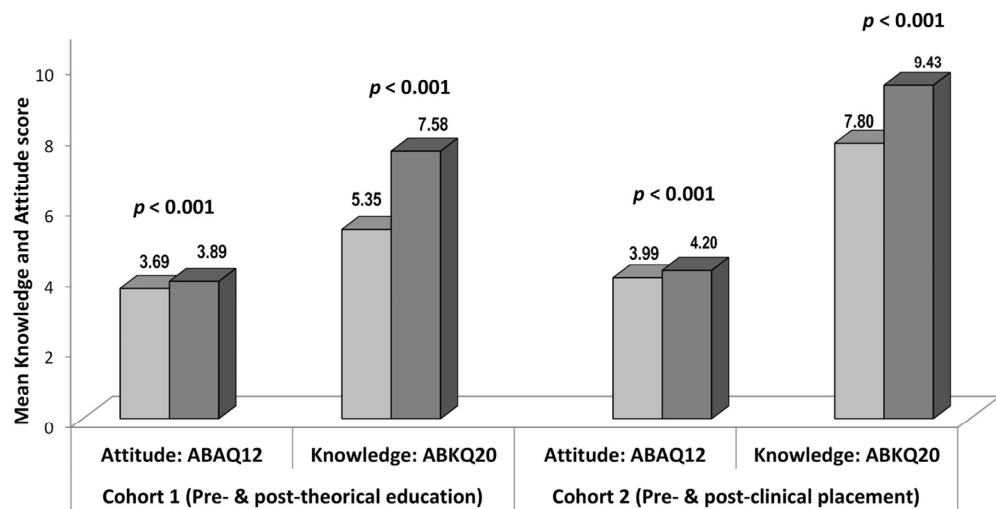


Fig. 1. Changes in breastfeeding knowledge and attitude from pre to post theoretical education and clinical placement.

Pound et al., who found that prior breastfeeding experiences were associated with higher level of breastfeeding knowledge among health professionals in Australia, UK and Canada.<sup>5,6,35</sup> As most respondents were school leavers prior to commencing their nursing studies, their previous experiences with breastfeeding were mostly related to close family members whom they had observed to have been breastfed. This is consistent with Bozzette and Posner<sup>20</sup> who reported most baccalaureate students had no prior breastfeeding experience and little understanding of breastfeeding. However, this difference on breastfeeding knowledge not evident after theoretical or clinical education.

In this study, sociodemographic factors were no longer an influencing factor on the level of breastfeeding knowledge and attitudes towards breastfeeding following theoretical education and clinical placement. An explanation for this finding could be that the positive impact of breastfeeding education program influenced both attitudes and knowledge irrespective of previous breastfeeding experiences. This indicates the importance of theoretical and clinical education on increasing knowledge and changing attitudes towards breastfeeding.

### 5.1. Limitations

There are a number of limitations to this study that could be addressed in a future study. The sample in this study was nursing students at one private university, and a very homogenous population in terms of age and cultural background; thus, it may not be representative of all baccalaureate nursing students, particularly those outside Taiwan. Future study could include a larger sample of nursing students from different universities to represent the diversity of curricula and impact on breastfeeding education.

There were differences in the survey data collection for two cohorts of nursing students. Cohort One had been surveyed when they completed theoretical learning two weeks prior, but Cohort Two students completed the theoretical subject ten months prior to the survey (post-theoretical/pre-clinical placement) which may have affected their ability to answer the questions. Although we cannot state which was the most effective: clinical or theoretical learning, we can state that both increased the students' breastfeeding knowledge and attitudes. Supportive pedagogy including simulated learning and skills practice in the laboratory

and if possible exposure to breastfeeding women prior to placement, would the most appropriate learning for nursing or other health professional students. Future research could follow one group of students across their theoretical and clinical breastfeeding education to determine whether their knowledge continues to increase and their attitudes change across the two years. Despite the existing limitations, the strength of this study is that it captured students' breastfeeding knowledge and attitude through pre- and post-survey questionnaire, and the outcomes revealed that the knowledge and skills were transferable to clinical placement.

## 6. Conclusion

Results revealed that the current breastfeeding education program in Taiwan, both the theoretical and clinical components, increased nursing students' knowledge and improved positive attitudes towards breastfeeding. Further research could explore whether students' prior knowledge and attitude at commencement of the course are important factors to consider when developing a comprehensive breastfeeding education program.

### Ethical statement

Ethical Approval for this study was granted from Human Researcher Ethics Committee, Western Sydney University. The approval number is H11611. The date of approval is 3 May 2016.

### Declarations of interest

None.

### Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

### Acknowledgments

We wish to thank all nursing students who participated in this research.



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# **Chapter 6: Expectations and Experiences of Nursing Students in Supporting New Mothers to Breastfeed: A Descriptive Qualitative Study**

## **6.1 Publication (Paper 4)**

Yang, S.-F., Burns, E., Salamonson, Y., & Schmied, V. (2019). Expectations and experiences of nursing students in supporting new mothers to breastfeed: A descriptive qualitative study. *Journal of Clinical Nursing*, 28(11-12), 2340–2350. doi:10.1111/jocn.14836 (Impact Factor: 1.757)

## **6.2 Relevance to the Thesis**

This qualitative paper reports the experiences of nursing students in supporting breastfeeding women. The data were collected by conducting focus groups and small group interviews with university teaching staff, clinical nursing staff, women who received care in relation to breastfeeding from nursing students, and fourth-year nursing students who had completed all the relevant theoretical and clinical practice. The findings in Paper 4 reveal that students lacked confidence in supporting breastfeeding within clinical settings. Students also highlighted the importance of establishing trust to effectively support mothers, and a need for additional confidence to provide appropriate breastfeeding information.

## 6.3 Paper 4





Received: 25 September 2018 | Revised: 16 January 2019 | Accepted: 9 February 2019

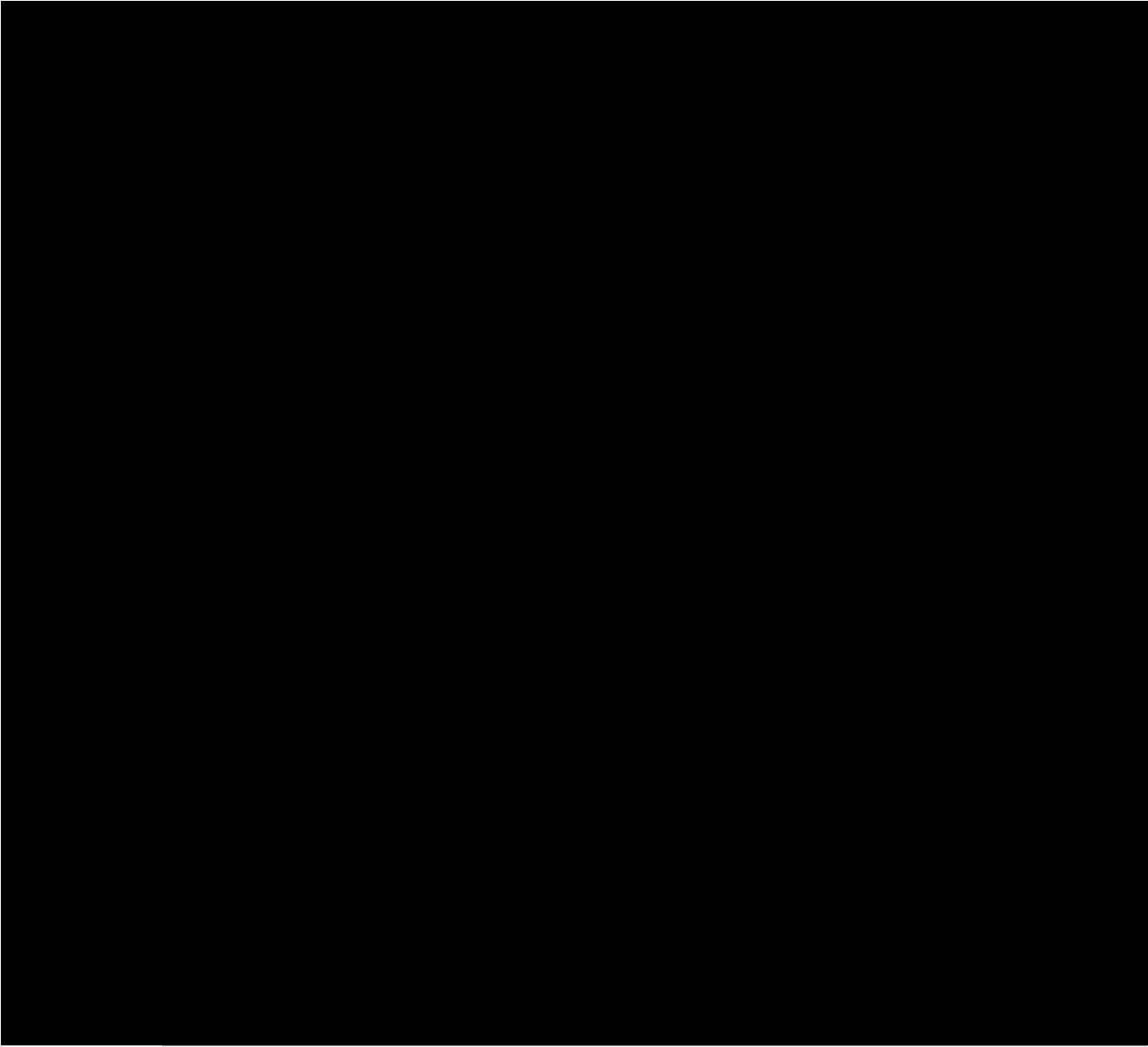
DOI: 10.1111/jocn.14836

**ORIGINAL ARTICLE**

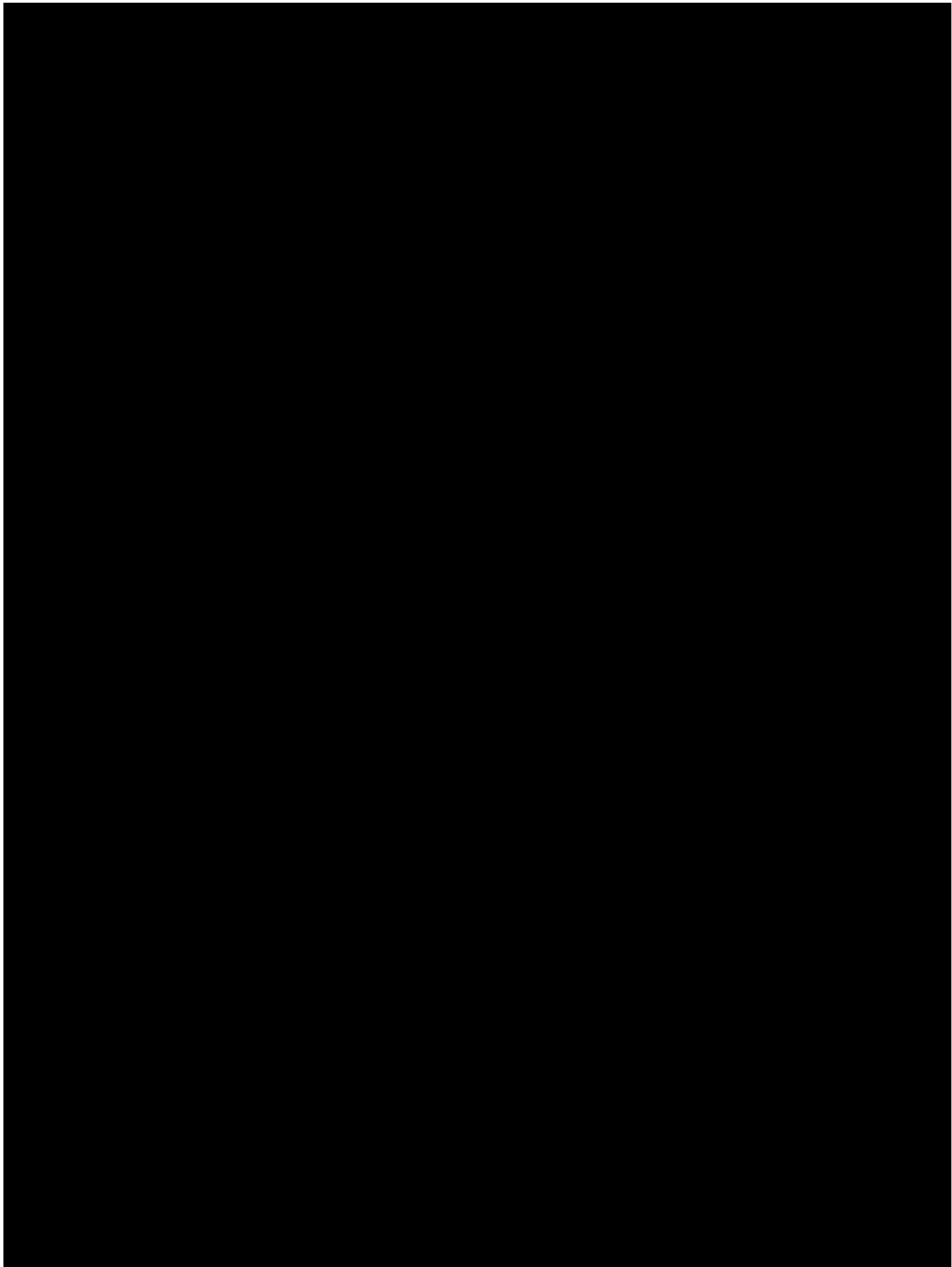
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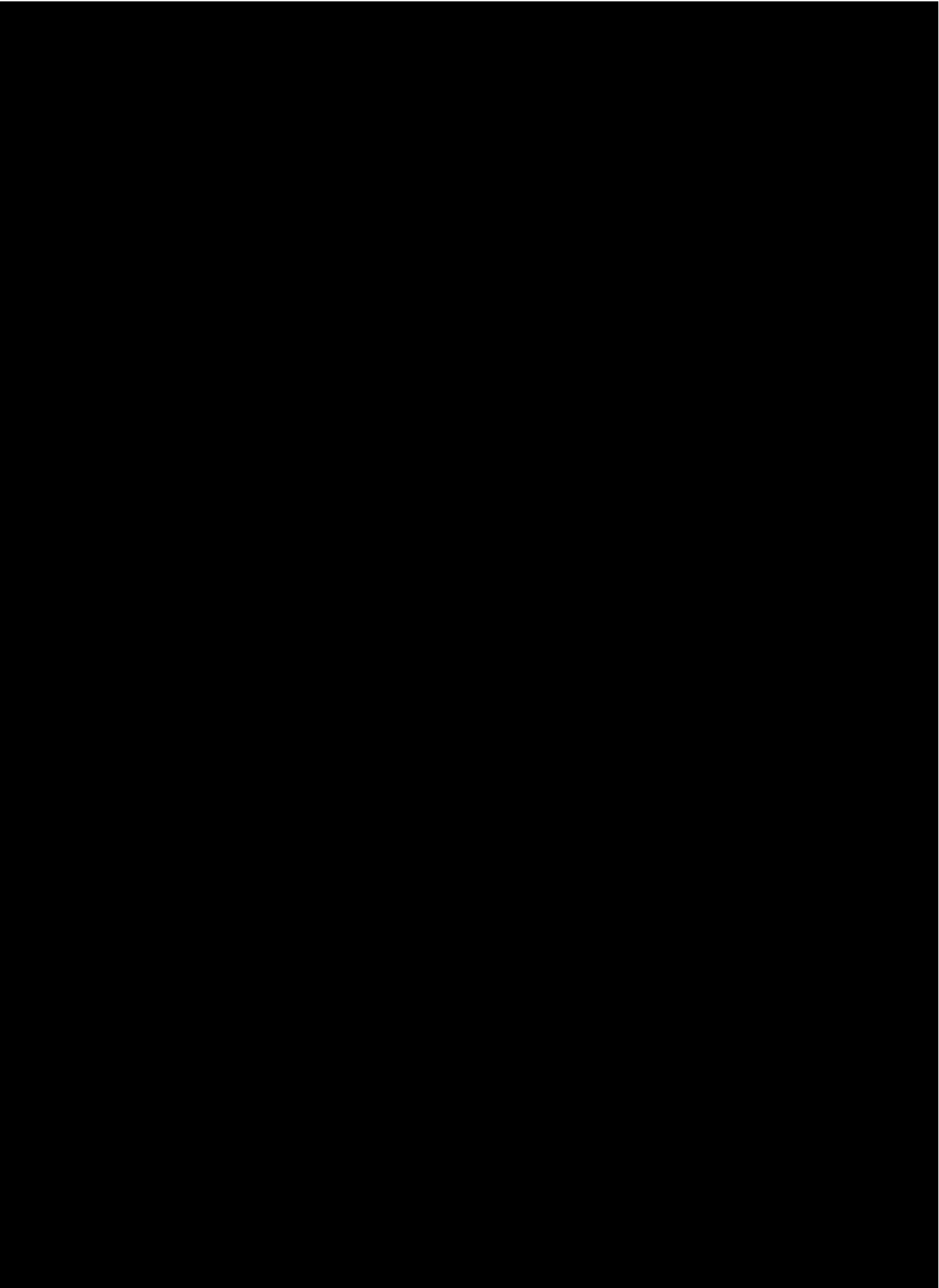
# Expectations and experiences of nursing students in supporting new mothers to breastfeed: A descriptive qualitative study

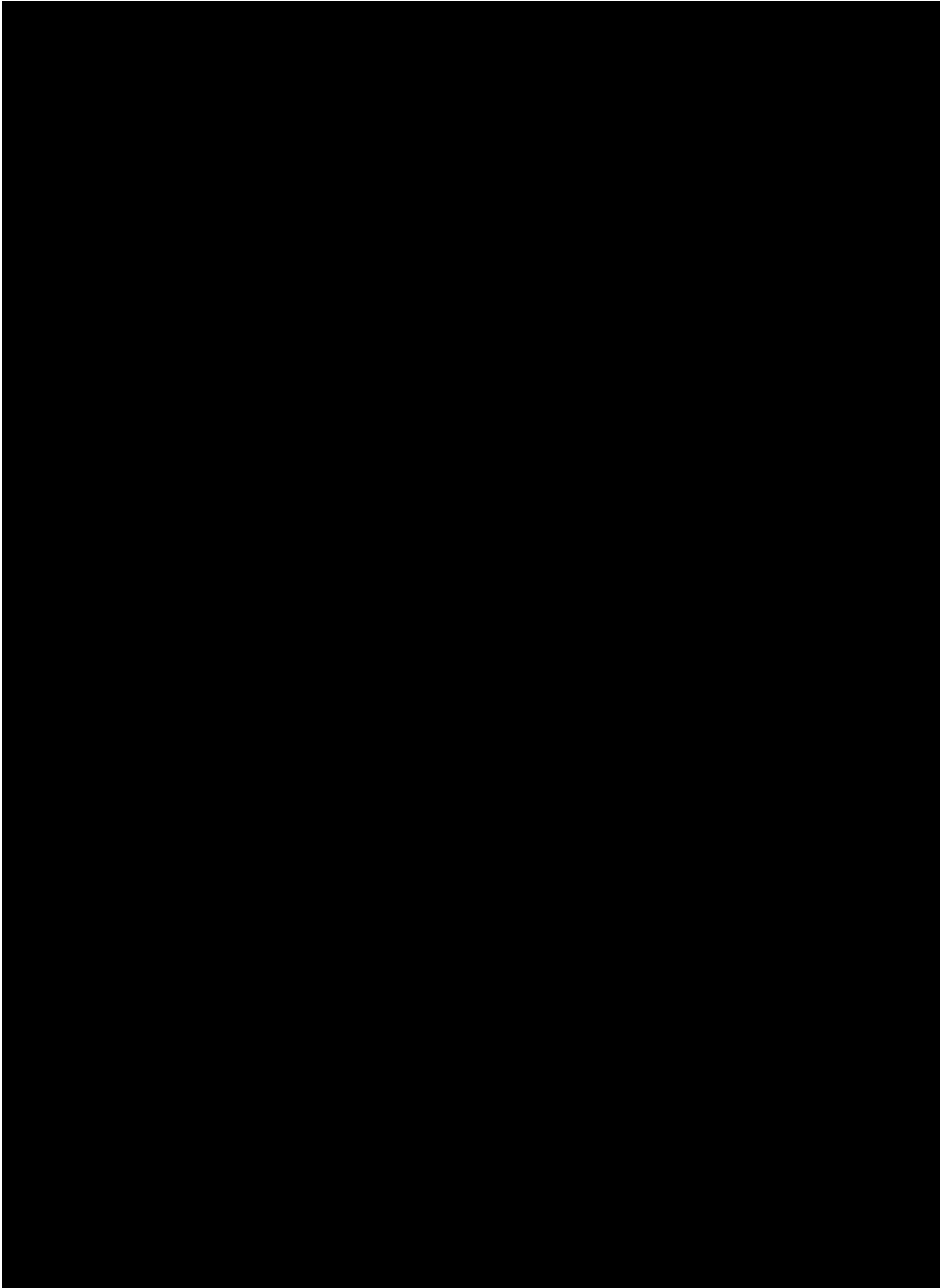
Shu-Fei Yang<sup>1,2</sup>  | Elaine Burns<sup>1</sup>  | Yenna Salamonson<sup>1,3</sup>  | Virginia Schmied<sup>1</sup> 

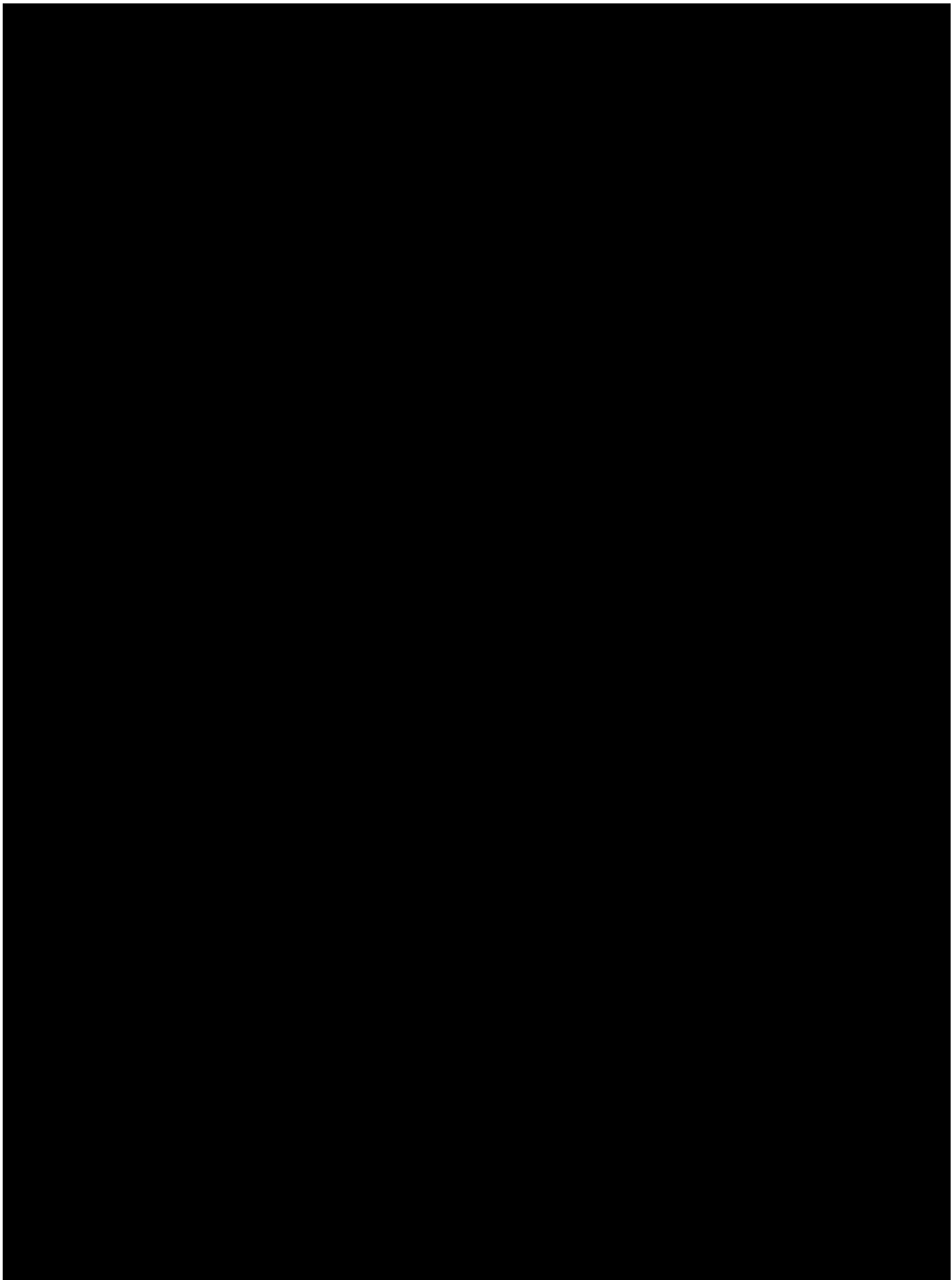


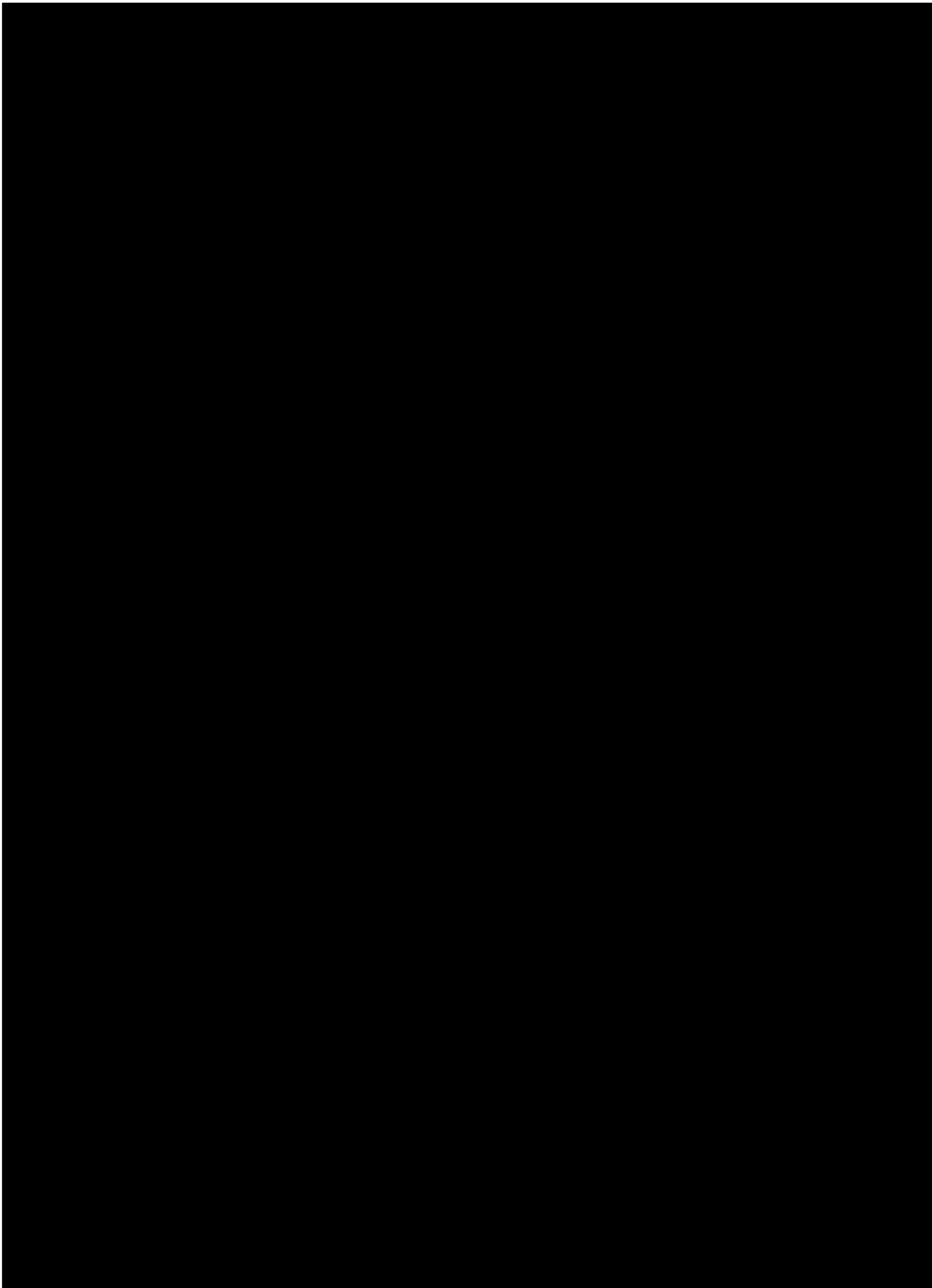


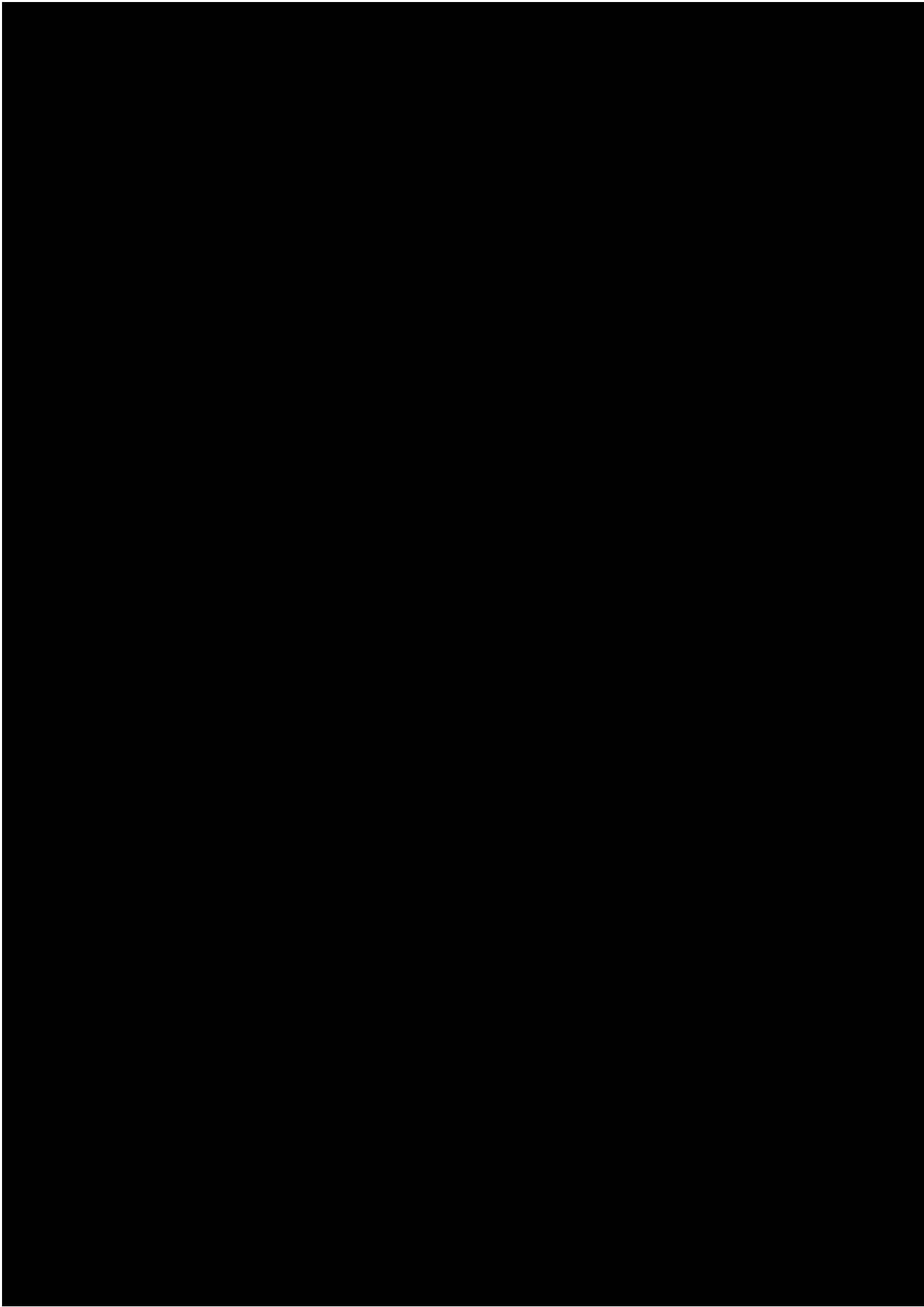


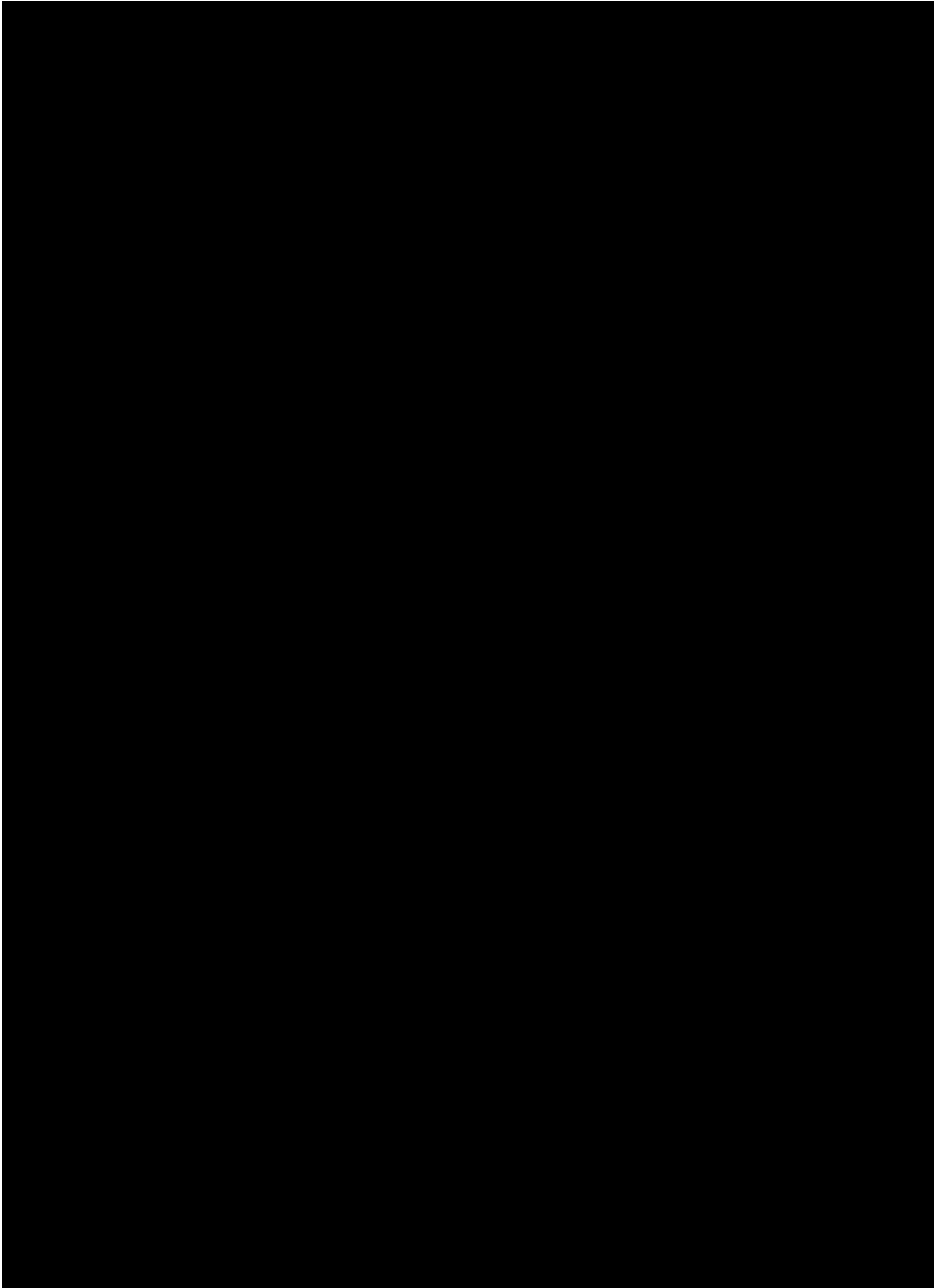


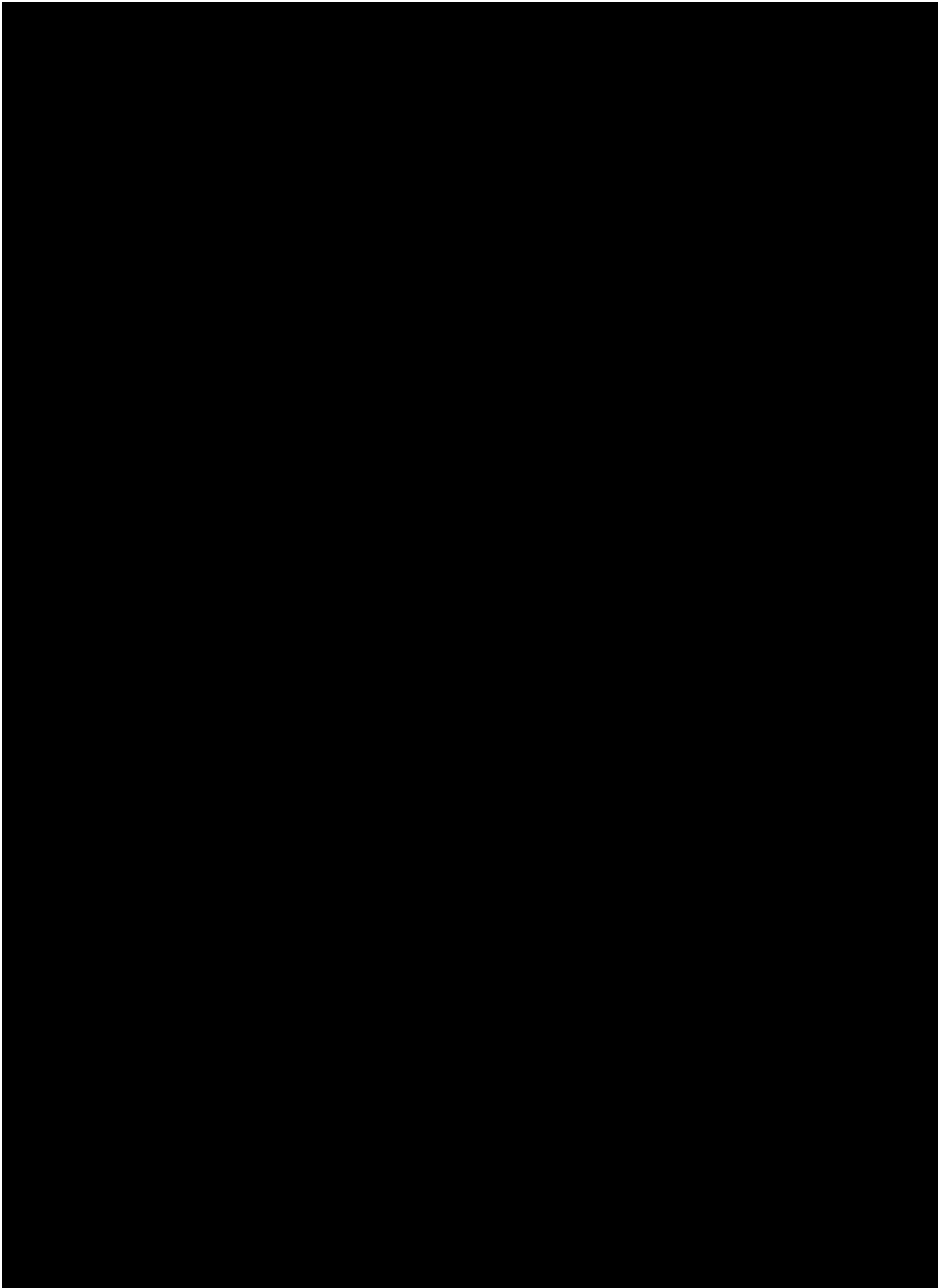




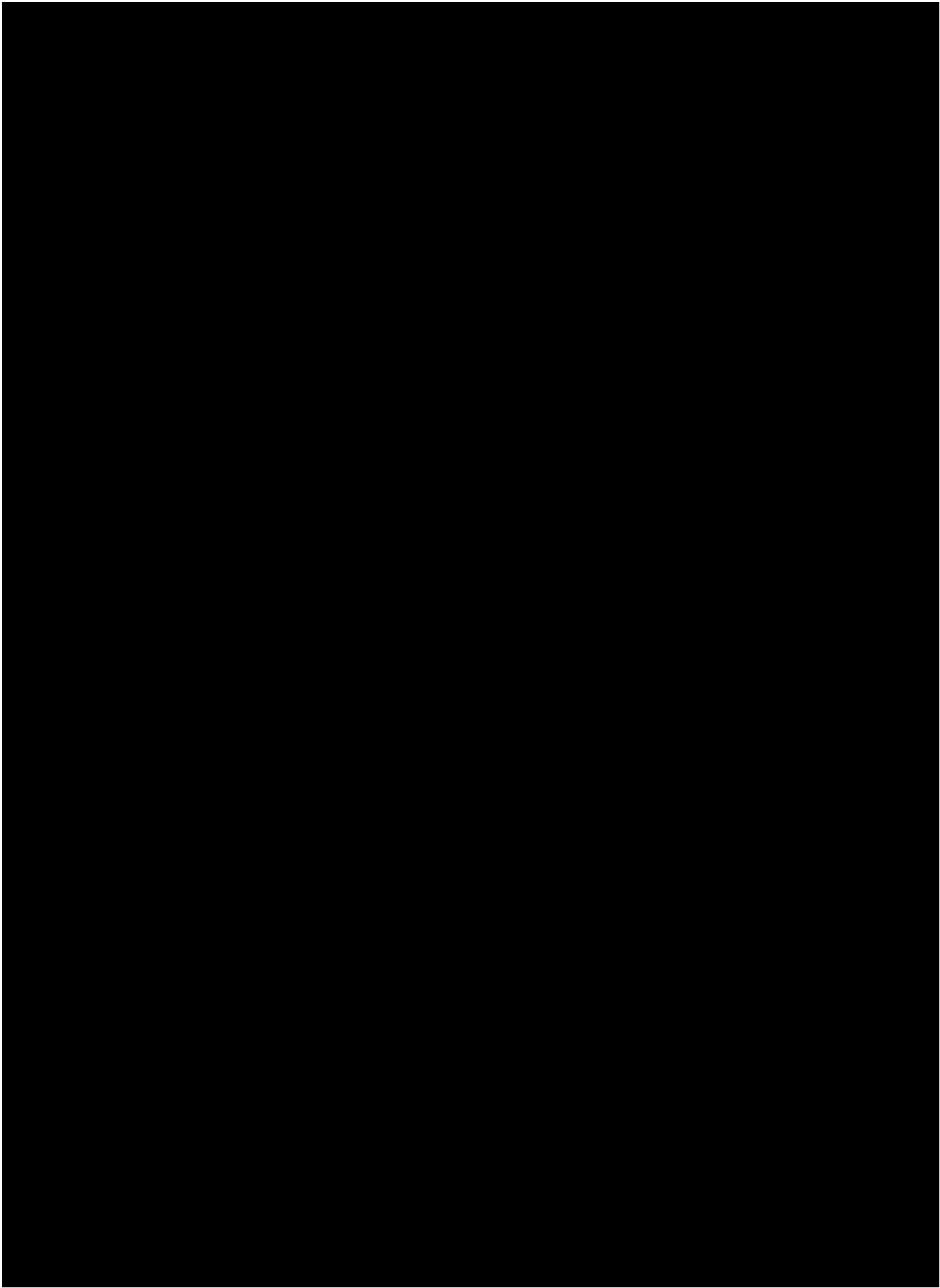












# Chapter 7: Discussion and Conclusions

## 7.1 Introduction

Breastfeeding is an important public health initiative. In the past five years the rate of exclusive breastfeeding at six months has declined in Taiwan, despite the widespread implementation of global initiatives such as the BFHI (Waits et al., 2018). However, demographic changes, employment commitments and obstetric intervention appear to have influenced the high breastfeeding rates reported in 2011 (Health Promotion Administration, 2017c; Waits et al., 2018). As argued in Chapter 1, it is important that the education nursing students receive takes into consideration contemporary changes in society.

This final chapter summarises the findings of the research project and identifies the implications for nursing education relative to breastfeeding in Taiwan. Chapter 7 provides an overview of the strengths and gaps in current curricula and applies Mezirow's transformative learning theory to make recommendations for redesigning the maternal and child nursing component of national syllabus, particularly in relation to breastfeeding. Based on Mezirow's approach, changes are proposed to enhance student learning and preparation for practice; this includes building student skills in communicating effectively with women. This chapter also includes a discussion of the implementation of BFHI and important issues related to breastfeeding support for Taiwanese women, particularly the changing sociodemographics affecting the practice itself. Chapter 7 concludes with a summary of the implications for practice, the strengths and limitations of the study, and recommendations for future research.

## 7.2 Summary of Findings

The BONUS Project was a mixed-methods research initiative containing both quantitative and qualitative components. The study was unique in that it not only included nursing students but also gathered data to explore the perspectives of educators, nursing staff and, importantly, mothers. This thesis was structured to include four interrelated papers.

The first published paper presented the findings of a systematic review of the literature (Paper 1, Chapter 2). This review synthesised the findings of 14 studies that assessed nursing students' or other health professional students' knowledge, attitudes or experiences related to breastfeeding. It included four studies that specifically tested an educational intervention to improve breastfeeding knowledge (Yang et al., 2018). The findings indicated that in some settings health professional students demonstrated mid-range scores on breastfeeding attitudes, and that their knowledge of the practice was limited, particularly in relation to breastfeeding assessment and management; these scores did not necessarily improve following the completion of a standard maternal and child nursing curriculum. In four of the studies included for review (Yang et al., 2018), a specific breastfeeding education program was evaluated and found to increase the overall knowledge of nursing students relative to breastfeeding. Several factors were noted to influence breastfeeding knowledge and attitudes, including timing of the introduction and revisiting of maternal and child health content within the curriculum, previous personal breastfeeding experience, gender, cultural practices and government legislation. This review also highlighted the need to determine how breastfeeding knowledge and skills are best facilitated in undergraduate nursing curricula to help students relate theoretical breastfeeding

knowledge to practice (Yang et al., 2018). In turn, this informed the design of the qualitative component in this research project.

To examine the current knowledge and attitudes of Taiwanese nursing students, a validated tool to assess each factor in relation to breastfeeding was required. For this, the ABKAQ-SF was selected as the most appropriate tool and subsequently translated into Chinese. This version of the ABAQ was subjected to cross-cultural psychometric validation (Paper 2, Chapter 4). Using a prospective two-cohort survey design that included a baseline and follow-up data collection design, nursing students ( $n = 205$ ) enrolled in a four-year BN program completed the Chinese version of the ABAQ (Yang et al., 2018). To ensure that the translated version of the questionnaire was valid and culturally appropriate, the established procedure of forward and backward translations was undertaken, and the items of the scale were then assessed for construct validity, content validity and internal consistency; this helped to examine for group differences and responsiveness of the revised ABAQ12. Although no sociodemographic group differences were uncovered in the scores, respondents with breastfeeding-related experiences were more likely to have positive attitudes towards the practice. Commentary on this paper and its findings by Karen Wambach (2018) (Professor and Director of the PhD program at the School of Nursing, The University of Kansas) confirmed that the data indicated strong psychometric properties of the ABAQ12. Wambach (2018) also demonstrated this measurement was sensitive enough to detect differences in breastfeeding attitudes based on personal experiences and following practise in supporting breastfeeding mothers during clinical placement.

The third published paper presented the quantitative results, which examined the influence of education on nursing students' knowledge and attitudes towards

breastfeeding (Paper 3, Chapter 5). Using a pre- and post-test survey design, data from two cohorts of nursing students ( $n = 215$ ) were collected before and after theoretical education and clinical learning experience. Students in both cohorts demonstrated significant improvements in breastfeeding knowledge and attitude post-theoretical education and post-clinical placement. (Yang et al., 2018). Students who had experience with close family members breastfeeding or younger siblings being breastfed demonstrated higher levels of knowledge prior to theoretical education; however, any sociodemographic differences in knowledge and attitude about breastfeeding were ameliorated following the theoretical and clinical learning intervention, which focused on the practice of breastfeeding itself.

The fourth paper reported the qualitative findings on the experiences of nursing students in supporting breastfeeding (Paper 4, Chapter 6). Data were collected using focus group interviews, which included university teaching staff, clinical nursing staff, women who received care from nursing students in relation to breastfeeding, and fourth-year nursing students who had completed all of the relevant theoretical and clinical practice components. Three main themes emerged from the data: 'high expectations', 'reality is different' and 'improving confidence in students'. Nursing students were expected to be able to educate and support breastfeeding mothers when they commenced in the postnatal unit. To do so, it was important that students could establish trust and feel confident in providing relevant information. However, participants in the study indicated that nursing students needed to actually practise newly learned skills with real women or within simulated learning environments immediately before placement. Overall, Paper 4 identified nursing students' need for further support to develop effective communication skills and to build confidence prior to clinical placement (Yang et al., 2019).

## **7.3 Review of Current Curriculum Related to Breastfeeding**

The BONUS Project was borne out of a desire to increase breastfeeding rates and improve breastfeeding experiences of Taiwanese women through superior education and training opportunities. The researcher wished to explore this and concurrently assess whether the current curriculum was adequately preparing students to support breastfeeding mothers. To address the requisite breastfeeding knowledge, attitudes and supportive behaviours, there was a need to assess the current status of breastfeeding education, both in the classroom and during clinical placement. To improve future curriculum development, all arguments presented herein were based on the principles of transformative learning theory (Christie, Carey, Robertson & Grainger, 2015; Mezirow, 1997). This approach empowers students to reflect critically on their learning and prepares them to become active and self-directed learners (Taylor, 2017). Sections 7.3.1 and 7.3.2 propose that a review of the current curriculum is required, and that this should be based on transformative learning theory.

### **7.3.1 Strengths of the Nursing Curriculum**

The quantitative results in this mixed-methods research project revealed that the current breastfeeding education program (including both its theoretical and clinical components) at CUMT in Taiwan increased nursing students' knowledge and promoted positive attitudes towards breastfeeding (Yang et al., 2018). Within the program, didactic teaching is the predominant pedagogical approach, particularly for teaching theoretical content. A didactic approach is teacher-centred and focuses on the transmission of knowledge (as stipulated in curriculum and textbooks), with students being passive recipients of knowledge in classroom settings (McLaughlin et al., 2014; Nie & Lau, 2010). Nurse educators are likewise responsible, not only to

enhance nursing students' academic performance but also to facilitate their understanding of key concepts required to pass the national license examination as registered nurses in Taiwan (Ministry of Examination, 2018). In 2017, the registered nurse license pass rate was 79.8% at CUMT, which is over twice the national license pass rate of 39% (Ministry of Examination, 2018). Therefore, the current nursing curriculum and pedagogical approach is effective in equipping nursing students with the knowledge and experience to pass national examination.

### **7.3.2 Gaps in the Current Curriculum for Contemporary Practice**

Although the current curriculum improves breastfeeding knowledge and attitudes, the qualitative study demonstrated that there are deficits in the way the curriculum and teaching approach prepares students for clinical practice. Findings of the qualitative study further indicated that the reality of supporting mothers to breastfeed in clinical settings was more challenging than students' initially expected; as such, many struggled to communicate effectively with new mothers to meet their breastfeeding needs. What seemed to trigger anxiety among students during clinical placement was being left alone to support a breastfeeding woman for an extended period; this was despite having access to a clinical educator whom they were able to consult. Indeed, students often felt pressured in their ability to answer any questions women may ask (Yang et al., 2019).

It is possible that the didactic teaching method contributed to this situation. A previous Taiwanese study by Chiang, Chapman and Elder (2010) reported that most of the participating nursing teachers held a traditional teacher-centred and content-driven conception of teaching and learning, which was not surprising given the traditional approach to nursing education adopted in Taiwan (Chiang et al., 2010). Importantly, the didactic lecturing model gravitates the focus to the educator, and is

less likely to stimulate critical thinking abilities or develop students' problem-solving skills (Lin, Han, Pan & Chen, 2015). Therefore, the introduction of a student-centred pedagogical approach, that facilitates classroom interactions between teachers and students, will enable students to think critically, learn actively, solve problems, and encourage cooperative learning and knowledge utilisation (Chan, Sit, Wong, Lee & Fung, 2016; Lin et al., 2015).

Further, there is a need to review the curriculum content. Students demonstrated good knowledge of breastfeeding physiology and the processes associated with its initiation; however, changing demographics in Taiwan and employment imperatives means that students must also be able to adapt their practice to women's evolving needs.

In summary, the findings highlighted the importance of:

1. curricular emphasis on equipping nursing students to support breastfeeding women beyond the 'doing the month' period
2. contextualising the curriculum to the changing sociodemographics of contemporary Taiwan
3. ensuring students have good therapeutic communication skills
4. increasing the focus across the curriculum on active learning, whereby students become reflective learners.

Hence, it is essential that nursing students not only have a positive attitude towards breastfeeding, but also sufficient knowledge, competence and skills to be able to support breastfeeding mothers and meet their individual needs.

## **7.4 Proposed Way Forward: Future Curriculum Development**

In this project it was evident that the current education initiatives on breastfeeding are effective in improving students' knowledge and attitudes towards



the practice. However, this finding may be misleading, suggesting that no further improvement is required. The findings of the qualitative study indicated that consideration must be given to how the curriculum and approach to teaching can be strengthened to adequately prepare students for clinical practice, particularly in relation to their communication skills. Nursing students need to understand and attune to mothers' experiences and their primary concerns during both pregnancy and childbirth periods. In this sense, teaching and learning frameworks could enhance future curriculum development—a gap in which Mezirow's transformational learning theory may be able to fill.

#### **7.4.1 Mezirow's Transformative Learning Theory**

As this thesis was focused on establishing current knowledge of, attitudes towards and confidence in nursing students in providing care to breastfeeding women, it was pivotal that the relevant educational programs were underpinned by a pedagogical approach that optimises student learning. Although a number of theoretical approaches to learning could be applied to inform curriculum development, Mezirow's (1991) transformative learning theory provides the most appropriate framework to examine the current nursing curriculum at CUMT (relative to breastfeeding) and to inform future curriculum design, development and innovations within this context. Indeed, the transformative learning theory has previously been used to inform teaching and learning in undergraduate nursing curricula (Brown, 2011; Muraraneza & Mtshali, 2018), and may again be useful in improving breastfeeding education in this area.

Originally developed by Jack Mezirow (1991), the theory of transformational learning focused on the transformation of adult learners' attitudes, values, beliefs and views. According to Mezirow (1991), transformative learning is “gained through

critical self-reflection, as distinct from the knowledge gained from our ‘technical’ interest in the objective world or our ‘practical’ interest in social relationships” (p. 87). Implicit and explicit within this theory, educators are encouraged to create an atmosphere that fosters the evaluation of beliefs and views by using self-reflection, and by assisting learners to become aware and critical of their own assumptions (Christie et al., 2015). Jarvis (1992) defined reflection as an important phase of the learning process, in which people consciously explore their experiences to arrive at new understandings and behaviours. As transformative learning is a route to critical reflection and higher levels of learning (Taylor, 2017), an educational approach that incorporates elements of transformative learning theory is likely to influence nursing students’ knowledge and attitudes towards breastfeeding.

#### **7.4.2 Strengthening the Simulated Learning Experience**

Students in this study indicated that while they were able to practise individual skills related to breastfeeding within a simulation, this was not ‘real’ enough. Instead, many needed to actually practise with real women or in realistic simulated learning environments before placement (Yang et al., 2019). Likewise, Ahmed and El Guindy (2011) indicated that providing nursing students with opportunities to perform breastfeeding management skills, before actually caring for mothers in a clinical setting, may increase their confidence. To engage nursing students as active learners in their learning and clinical preparation for practice, there are three interdependent elements that make up the process: a check-in (briefing), clinical practice and a check-out (debriefing) (Henderson et al., 2018). Henderson et al. (2018) suggested that a ‘briefing’ learning process in undergraduate nursing education within laboratory settings, simulation suites or clinical practicum learning spaces is necessary to enable students to prepare for clinical placement. This is

consistent with Rhodes and Burgess (2018) who reported that nursing students were able to aptly demonstrate breastfeeding skills and could manage more complex breastfeeding issues after participating in a breastfeeding simulation workshop. Therefore, supportive pedagogy that includes simulated learning and skills practice in a lab setting, as well as exposure (if possible) to breastfeeding women prior to placement, would offer the most appropriate learning opportunities for nursing students.

Based on the principles of transformative learning theory (Christie et al., 2015; Mezirow, 1997) and other emancipatory pedagogies (Blackmore, Kasfiki & Purva, 2018; Rhodes & Burgess, 2018), it is suggested that teaching approaches should be flexible and more diverse to better provide students opportunities that promote their professional competencies. There has been an international move for nursing curricula to be more student-centred. This will help to engage learners and explore attitudes and beliefs, while fostering motivation to gain knowledge and develop skills, including teamwork, self-reflection and case studies (Lin et al., 2015; McLaughlin et al., 2014; Raghunath, Anker & Nortcliffe, 2018; Spatz, 2005). Essentially, transformative learning approaches empower students to reflect critically and to develop both their active learning attitudes and independent logical thinking abilities (Taylor, 2017).

Students in this study also reported that they valued the scaffolded learning opportunities that commenced with their initial orientation to the postnatal unit. Next, observing skilled staff providing effective breastfeeding support, followed by supervision from a clinical teacher when first offering breastfeeding support, proved helpful (Yang et al., 2019). To facilitate a compassionate and supportive environment for nursing students, there is a need for nursing instructors to cultivate a

supportive relationship with clinical nursing staff to ensure students are clear as to whom they could approach when seeking assistance (Decker & Shellenbarger, 2012; Henderson, Cooke, Creedy & Walker, 2012). This is consistent with the BONUS Project, as participants therein also indicated that their confidence in supporting breastfeeding women in a postnatal ward could have improved if they were provided appropriate support throughout their initial clinical placement. More opportunities for simulation with actual women, or an actor representing a standardised patient, would be beneficial in equipping undergraduate nurses for graduate practice (Rhodes & Burgess, 2018; Sharif & Masoumi, 2005). Enhancing the content of theoretical and simulated breastfeeding education to incorporate women's breastfeeding experience, combined with realistic clinical student allocation, could serve to improve students' overall confidence in supporting breastfeeding (Sharif & Masoumi, 2005; Yang et al., 2019).

#### **7.4.3 Clinical Communication Skills**

It is likely that the pedagogical approach to learning in the current curriculum, as well as the sequence of clinical placement relative to theoretical learning, may need modification to better equip students with the communication skills required to proficiently converse with women during clinical placement. The ability of health professionals to communicate effectively with mothers has proven to be as important as having breastfeeding knowledge (McInnes & Chambers, 2008). However, it is not uncommon for health professionals to approach breastfeeding communication with an expert–novice approach (Burns, Schmied, Fenwick & Sheehan, 2012); this tactic automatically positions women as being uninformed. Observing this approach to communication can lead to students feeling even more 'novice' than mothers, especially when the latter seeks support and answers to her

questions. In addition, when expert clinicians approach breastfeeding as the ‘mechanical’ transfer of milk from the woman’s ‘equipment’ to the baby (Burns et al., 2013), this further stifles any opportunities for relational communication and shifts the focus from the mother–baby interaction during breastfeeding to the simple transfer of milk. In a review of breastfeeding support, Schmied, Beake, Sheehan, McCourt and Dykes (2011) demonstrated the importance of health professionals having an authentic presence characterised by a trusting relationship, an empathetic approach, sharing the experience, and both knowledge and skills. Thus, it is essential for educators to provide more interactive learning opportunities for students to actually explore realistic scenarios and experiment more, and to enhance communication skills with a standard patient.

#### **7.4.4 Issues to Consider in Future Curriculum Development Relative to BFHI**

Implementing the BFHI has been demonstrated to be effective in increasing initiation and maintaining exclusive breastfeeding rates, as well as improving the duration of breastfeeding (Esbati, Henderson, Taylor & Barnes, 2018; Schmied et al., 2014). According to WHO/UNICEF guidelines, these facilities need to be reassessed approximately every three years to ensure ongoing adherence to the criteria. However, most centres do not have internal monitoring systems to ensure that health professionals continue to abide by these standards; hence, baby-friendly practices are not always maintained over time (WHO, 2017). Further, according to the second step of the Ten Steps to Successful Breastfeeding, organisations must ensure that staff members have ‘sufficient knowledge, competence and skills’ (WHO & UNICEF, 2018, p. 42). It is essential that nursing students during their studies become familiar with both BFHI standards and the Ten Steps, and especially recognise the importance

of early skin-to-skin contact after childbirth as well as rooming-in during hospitalisation.

While Taiwan has embraced the BFHI, only 80% of maternity units are accredited as being baby-friendly. Recent research has demonstrated that some of the steps are not routinely implemented in practice. A national survey conducted between 2011 and 2016 in Taiwan reported that there was a growing number of births at certified baby-friendly hospitals, but a decline in early skin-to-skin contact and rooming-in (Waits et al., 2018). Unsurprisingly, lack of awareness of Steps 4 (skin-to-skin contact) and 7 (rooming-in) of the Ten Steps were identified as factors affecting national breastfeeding rates (Chiou et al., 2014; Waits et al., 2018).

In addition, women value information when it is individualised and relevant to a mother's particular situation and challenges (James, Sweet & Donnellan-Fernandez, 2017). Therefore, health professionals should enquire about social networks for women to better establish a supportive environment in which they can breastfeed (known also as Step 10: ongoing support) (Aryeetey & Dykes, 2018; Esbati et al., 2018). Therefore, it is critical that Taiwan's current nursing curriculum is reviewed to ensure that students are learning about the BFHI in such a way that they will be able to retain knowledge and have the capacity to lead change when they are registered nurses working in a maternal and child health facility.

#### **7.4.5 Changing Sociodemographics Affecting Breastfeeding**

The low birthrate (8.23 per 1,000; mid-year population in 2017) in Taiwan is a reflection of women's choices; in particular, those with higher levels of education are more likely to marry and have their first child at an older age (Chien et al., 2015; Health Promotion Administration, 2018b). The majority of these women are employed full time and are required to return to the workplace shortly after they give

birth. This return to work usually occurs when their newborn is about eight weeks old, which coincides with the nationwide policy of eight weeks paid maternity leave (Feng & Han, 2010). Mothers of newborns who participated in this study provided important insights into their own learning needs and the support they expected both from nursing staff and nursing students (Yang et al., 2019). The expression of breastmilk was an issue for mothers, in that their most pressing concern appeared to focus on whether they would be able to successfully do so upon returning to work. Unsurprisingly, barriers to maintaining optimal duration of breastfeeding included maternal employment, lack of support, an unfriendly breastfeeding culture in one's workplace or feeding in public places (Balkam, Cadwell & Fein, 2011). Several policies in Taiwan were developed to create breastfeeding-friendly environments in which women can feel at ease to breastfeed in settings such as hospitals, public places, workplaces and in the wider community (Chen & Kuo, 2013).

Improving breastfeeding support to mothers has been the focus of several national and international health organisations. WHO advocates for minimum conditions such as paid maternity leave, part-time work arrangements, facilities for expressing and storing breastmilk and breastfeeding breaks for women in paid employment to promote long-term exclusive breastfeeding (Sguassero, 2008). In Taiwan, working women are mostly employed full time and frequently opt to continue this arrangement following their return to work from maternity leave (Chen, Jones & Jackson, 2018). As such, student education for breastfeeding support must be situated within the respective sociocultural context and properly prepare individuals for real-world scenarios. Thus, nursing students in Taiwan need to be aware of the breastfeeding requirements and adjustments for a mother's early return

to work, as the majority of women must resume employment only two months postpartum.

Another change is the increase in transnational marriage, which currently comprises one-tenth of newly married couples in Taiwan. In 2016, 6.17% of mothers with newborns nationwide were immigrants (Ministry of the Interior Department of Statistics, 2018). Several studies have indicated that this group often lacks social support in Taiwan, which could also result in lower breastfeeding rates (Chen et al., 2011; Small, Lumley & Yelland, 2003). Social support is an important factor in breastfeeding outcomes, and women require both formal support from health professionals and informal support from family and friends during this process (Chen et al., 2011).

## **7.5 Implications for Practice**

Several implications have been identified based on the findings of this study. As the first six weeks of the postpartum period is challenging and a range of factors may influence one's decision to feed, nursing students need to acquire more breadth and depth of breastfeeding knowledge and experience to support and provide appropriate care to mothers. In addition to gaining awareness of the importance of BFHI standards, nursing curricula in Taiwan must focus particularly on Steps 2, 4, 7 and 10 of the Ten Steps to Successful Breastfeeding, as well as the adjustments mothers of newborns need to make for a successful early return to work.

Further, nursing education for breastfeeding support needs to consider sociocultural context and prepare students for the 'real world' they will eventually encounter following graduation. The BONUS Project highlighted the necessity for students to develop supportive communication styles prior to their clinical placement in a postpartum unit. Strategies that facilitate this skill acquisition could be provided



by nursing educators through interactive learning opportunities, whereby students learn using realistic role-play scenarios with a standardised patient (Davis & Sherrod, 2015; Schlegel, Woermann, Shaha, Rethans & van der Vleuten, 2012). This multifaceted approach to enhancing the content of theoretical and simulated breastfeeding education to incorporate women's breastfeeding experiences, combined with realistic clinical student allocation, could together serve to improve one's confidence in supporting breastfeeding.

## **7.6 Strengths and Limitations of the Study**

There were some limitations in this study that could be addressed in future research. This study recruited participants from a range of stakeholder groups, including women, teachers, nursing students and health professionals. However, students were solely recruited from a single site—that is, a private university in Taiwan—with a homogenous population in terms of ethnic background, age and education level. While participants were sourced from a range of stakeholder groups, the number contained in each group was small. Consequently, information collected may not have captured the diversity of individuals' experiences. Hence, the findings may be limited in their transferability to other nursing education settings both within and beyond Taiwan.

Despite these existing limitations, the strength of this study lies in its ability to capture students' breastfeeding knowledge and attitudes through the pre- and post-survey questionnaires, and in the different participant groups that contributed. Although one cannot state which component proved the most effective (i.e., clinical or theoretical learning), it is clear that both factors increased students' breastfeeding knowledge and attitudes, in turn.

## **7.7 Recommendations for Future Research**

A multi-site study that increases the number of participants from different universities, and that embodies the diversity of students' perceptions and different learning needs on breastfeeding, would be beneficial. As redesigning the curriculum at CUMT will require extensive time, an important first step would be to develop, trial and subsequently evaluate an innovative simulated learning experience related to breastfeeding. If resources permit, this initiative could be designed as a pilot randomised controlled trial in preparation for a larger multi-site study.

There is also an opportunity to trial a pre-clinical placement online learning module that emphasises practice and reflection on communication skills, and simulates clinical interactions related to breastfeeding. A brief (one-hour) learning module could assist students in negotiating the current misalignment of theoretical and clinical education. Future research could also focus (in relation to breastfeeding) on comparing the differences in health outcomes and experiences of women who utilise postpartum nursing centres compared to those who return home with family for the 'doing the month' period. It is likewise useful to explore the role of family in supporting breastfeeding, as well as the learning needs of students in assisting both family members and new mothers.

## **7.8 Conclusion**

This research project sought to explore if the current breastfeeding education program in Taiwan adequately prepares students to support breastfeeding mothers. It is essential that health professionals and students not only have a positive attitude towards breastfeeding, but also possess sufficient knowledge and skills to ably guide and assist breastfeeding women to at least six months postpartum. Overall, despite completing structured theoretical breastfeeding education prior to clinical placement,

students did not feel they were adequately prepared to support new mothers in practice. The findings also demonstrated the need for further support in developing effective communication skills and in building student confidence prior to clinical placement.

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# Appendix 1: Human Research Ethics Committee Approval

Locked Bag 1797  
Penrith NSW 2751 Australia  
Research Engagement, Development and Innovation (REDI)



REDI Reference: H11611  
Risk Rating: Low 2 - HREC

## HUMAN RESEARCH ETHICS COMMITTEE

3 May 2016

Professor Virginia Schmied  
School of Nursing and Midwifery

Dear Virginia,

I wish to formally advise you that the Human Research Ethics Committee has approved your research proposal H11611 "Breastfeeding knowledge and attitudes of baccalaureate nursing students in Taiwan", until 30 August 2018 with the provision of a progress report annually if over 12 months and a final report on completion.

### Conditions of Approval

1. A progress report will be due annually on the anniversary of the approval date.
2. A final report will be due at the expiration of the approval period.
3. Any amendments to the project must be approved by the Human Research Ethics Committee prior to being implemented. Amendments must be requested using the HREC Amendment Request Form: [http://www.westernsydney.edu.au/\\_data/assets/pdf\\_file/0018/491130/HREC\\_Amendment\\_Request\\_Form.pdf](http://www.westernsydney.edu.au/_data/assets/pdf_file/0018/491130/HREC_Amendment_Request_Form.pdf)
4. Any serious or unexpected adverse events on participants must be reported to the Human Ethics Committee via the Human Ethics Officer as a matter of priority.
5. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the Committee as a matter of priority
6. Consent forms are to be retained within the archives of the School or Research Institute and made available to the Committee upon request.

Please quote the registration number and title as indicated above in the subject line on all future correspondence related to this project. All correspondence should be sent to the email address [humanethics@westernsydney.edu.au](mailto:humanethics@westernsydney.edu.au).

This protocol covers the following researchers:

**Virginia Schmied, Elaine Burns, Yenna Salamonson, Shu-Fei Yang**

Yours sincerely



Professor Elizabeth Deane  
Presiding Member,  
Human Researcher Ethics Committee  
Western Sydney University

**WESTERN SYDNEY**  
UNIVERSITY



REDI Reference: H11611  
Expiry Date: 31 January 2019

**HUMAN RESEARCH ETHICS COMMITTEE**

20 September 2018

Professor Virginia Schmied  
School of Nursing and Midwifery

Dear Virginia,

**RE: Amendment Request to H11611**

I wish to formally advise you that the Human Research Ethics Committee has approved your request to amend your approved research protocol H11611 "Breastfeeding knowledge and attitudes of baccalaureate nursing students in Taiwan".

The approved amendments are:

Extension approved till 31/01/2019

Project specific approval conditions:

Please quote the registration number and title as indicated above in the subject line on all future correspondence related to this project. All correspondence should be sent to [humanethics@westernsydney.edu.au](mailto:humanethics@westernsydney.edu.au) as this email address is closely monitored.

Regards



PROFESSOR ELIZABETH DEARIE  
Presiding Member,  
Western Sydney University Human Research Ethics Committee

**University of Western Sydney**  
ABN 53 014 069 881 CRICOS Provider No: 00917K  
Locked Bag 1797 Penrith NSW 2751 Australia  
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## Appendix 2: Demographic Sheets and Study Instruments

### Demographic – Nursing Students (pre-theoretical survey)

1. Student ID number: \_\_\_\_\_
2. Year in nursing course/ semester: Year\_\_\_\_\_ Semester\_\_\_\_\_
3. Gender:  Male  Female
4. Year of birth: \_\_\_\_\_
5. Country of birth:  Taiwan  Other (describe): \_\_\_\_\_
6. Marital status:  Never married  Married  Other (describe): \_\_\_\_\_
7. Did your mother breastfeed you?  Yes  No  Don't know\_\_\_\_\_
8. Do you have prior experience with breastfeeding i.e., your siblings or any family members were breastfed?  Yes (if yes, please describe: \_\_\_\_\_)  No
9. Have you observed women breastfeeding in public places i.e., the shopping centres or restaurant?  Yes  No
10. Did you receive any education about breastfeeding when you were at school?  
 Yes  No
11. How confident do you feel in your ability to effectively support breastfeeding mothers?

Not confident at all

Extremely confident

—  —  —  —  —  —  —  —  —  —

0 1 2 3 4 5 6 7 8 9 10

## Demographic – Nursing Students (post-theoretical survey)

1. Student ID number: \_\_\_\_\_

2. Year in nursing course/ semester: Year \_\_\_\_\_ Semester \_\_\_\_\_

3. How satisfied are you with the quality of the breastfeeding theory instruction you received in the classroom in your Maternal and Child Nursing subject?

Extremely dissatisfied

Extremely satisfied

0 1 2 3 4 5 6 7 8 9 10

4. How satisfied are you with the quality of the breastfeeding laboratory-skills practice you received in your Maternal and Child Nursing subject?

Extremely dissatisfied

Extremely satisfied

0 1 2 3 4 5 6 7 8 9 10

5. How confident do you feel in your ability to effectively support breastfeeding mothers?

Not confident at all

Extremely confident

0 1 2 3 4 5 6 7 8 9 10

6. Please provide any additional comments on the Maternal and Child Nursing subject:

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## Demographic – Nursing Students (pre-clinical placement survey)

1. Student ID number: \_\_\_\_\_
2. Year in nursing course/ semester: Year \_\_\_\_\_ Semester \_\_\_\_\_
3. Gender:  Male  Female
4. Year of birth: \_\_\_\_\_
5. Country of birth:  Taiwan  Other (describe): \_\_\_\_\_
6. Marital status:  Never married  Married  Other (describe): \_\_\_\_\_
7. Did your mother breastfeed you?  Yes  No  Don't know \_\_\_\_\_
8. Do you have prior experience with breastfeeding i.e., your siblings or any family members were breastfed?  Yes (if yes, please describe: \_\_\_\_\_)  No
9. Have you observed women breastfeeding in public places i.e., the shopping centres or restaurant?  Yes  No
10. How satisfied are you with the quality of the breastfeeding theory instruction you received in the classroom in your Maternal and Child Nursing subject?

Extremely dissatisfied Extremely satisfied

0	1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	---	----

11. How satisfied are you with the quality of the breastfeeding laboratory-skills practice you received in your Maternal and Child Nursing subject?

Extremely dissatisfied Extremely satisfied

0	1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	---	----

12. How confident do you feel in your ability to support breastfeeding mothers?

Not confident at all Extremely confident

0	1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	---	----

## Demographic – Nursing Students (post-clinical placement survey)

1. Student ID number: \_\_\_\_\_
2. Year in nursing course/ semester: Year \_\_\_\_\_ Semester \_\_\_\_\_
3. How many times did you assist new mothers with breastfeeding support during your Obstetric Nursing clinical rotation?

0  0   1  1-5   2  6-10   3  11-15   4  16-20   5  20 and above

4. Were you given an opportunity to practice breastfeeding instruction using breastfeeding equipment (i.e., electric breast pumps, nipple shields or breast pads)?

1  Yes   0  No

5. Did you have opportunities to teach breastfeeding mothers outside of the hospital setting?

1  Yes (please describe location: \_\_\_\_\_)   0  No

6. How confident do you feel in your ability to support breastfeeding mothers?

Not confident at all Extremely confident

—  —  —  —  —  —  —  —  —  —

0   1   2   3   4   5   6   7   8   9   10

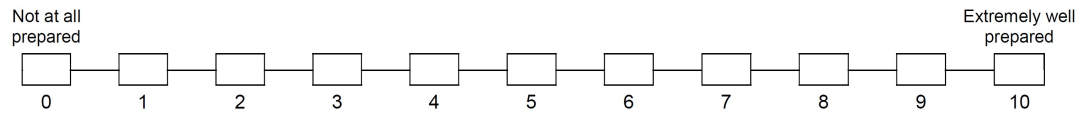
7. How well did your theory instruction in the classroom in second year prepare you to support women with breastfeeding during this clinical rotation?

Not at all prepared Extremely well prepared

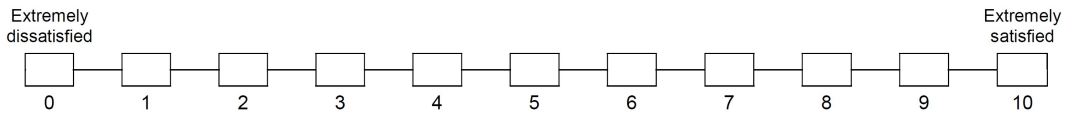
—  —  —  —  —  —  —  —  —  —

0   1   2   3   4   5   6   7   8   9   10

**8. How well did your laboratory-based skills practise in second year prepare you to support women with breastfeeding during this clinical rotation?**



**9. How satisfied are you with the quality of the breastfeeding instruction you received from staff in the clinical placement?**



**10. Please provide any additional comments on the Maternal and Child Nursing clinical placement:**

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## Australian breastfeeding knowledge and attitude questionnaire

To what extent do you agree or disagree with the following statements about breast milk and breastfeeding? Please mark the appropriate response.

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
1. Infant formula is more easily digested than breast milk.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Breast milk is the ideal food for babies.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Formula feeding is a good way of letting fathers care for the baby.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Breastfeeding & formula feeding are both equally acceptable methods of feeding infants.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Breastfeeding increases mother-infant bonding.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Breastfeeding provides health benefits for infants that cannot be provided by infant formula.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Mothers who smoke should formula feed their babies.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Breastfeeding is incompatible with working outside the home.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Fathers feel left out if a mother breastfeeds.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Breastfed babies need to be fed too often.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Infant formula is as healthy for an infant as breast milk.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Breastfeeding is more convenient than formula feeding.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Formula feeding is the better choice if the mother plans to go out to work.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. The benefits of breast milk last only as long as the baby is breastfed.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. A mother who occasionally drinks alcohol should not breastfeed her baby.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Formula feeding is more reliable because you can calculate the exact quantity of milk the baby is getting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Current infant formulas are nutritionally equivalent to breast milk.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Women should not breastfeed in public places such as restaurants.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

To what extent do you agree or disagree with the following statements? Please mark the appropriate response. If you are unable to give a response to a statement, mark the third response column headed “don’t know”.

	Correct	Incorrect	Don't know
19. Breastfed infants require extra water in hot weather.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. It is expected that breastfed infants will regain their birth-weight by two weeks of age.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. A breastfeeding woman should be advised to wean if she becomes pregnant.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. It is normal for an adequately breastfed 2 -week old infant to only pass a bowel motion every 3 days or so.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Women who have breastfed have a lower incidence of premenopausal breast cancer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Amoxycillin is the drug of choice to treat mastitis in a woman 3 months postpartum.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Breastfeeding is contraindicated for women with Hepatitis C.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. All women with cracked nipples should express their milk and rest the nipples for 24 hrs.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Increasing her fluid intake will increase a mother’s milk supply.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. High maternal prolactin levels are essential for the initiation of lactation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Introducing complementary feeds (water or formula) interferes with the establishment of breastfeeding.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Antenatal nipple preparation prevents nipple soreness in the first week postpartum.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. A nipple shield should be used if there are any problems with the infant attaching to the breast.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. The nutritional content of breast milk changes throughout a breastfeed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Formula fed infants have more ear infections than breastfed infants.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. The most common cause of cracked nipples is poor positioning and attachment of the infant at the breast.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. In most cases a breastfeeding mother must temporarily wean her baby while she is taking prescription medications.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Growth of breastfed infants differs from that of formula fed infants.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. A ‘top-up’ bottle after each breastfeed is the best way to manage an infant who is not gaining weight adequately.*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Only feeding from one breast at each feed is a management option for a woman with an oversupply of breast milk.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

# Demographic Sheets and Study Instruments (Chinese)

School of Nursing and Midwifery  
Western Sydney University  
Locked Bag 1797  
Penrith NSW 2751  
Australia



## 母乳哺餵知識及態度問卷 Breastfeeding knowledge and attitude questionnaire

首先，關於以下母乳哺餵的描述，請根據您的看法，從「非常不同意」到「非常同意」勾選符合的選項。

		非常不同意	不同意	沒意見	同意	非常同意
1	配方奶比母乳更容易消化					
2	母乳對嬰兒是理想的食物					
3	餵食配方奶是父親照顧嬰兒的一個好方法					
4	哺餵母乳和配方奶兩者一樣都是可以接受的餵奶方法					
5	哺餵母乳可以增進母嬰之間的情感連結					
6	哺餵母乳提供嬰兒在配方奶所得不到的健康益處					
7	抽菸的母親應該以配方奶餵食嬰兒					
8	哺餵母乳與母親外出工作是互相抵觸的					
9	假如母親哺餵母乳，父親會覺得被忽略					
10	哺餵母乳的嬰兒必須非常頻繁的餵食					
11	對嬰兒而言，配方奶和母乳一樣健康					
12	哺餵母乳比餵食配方奶更方便					
13	假如母親計劃要外出工作，餵食配方奶是比較好的選擇					
14	母乳的好處只能維持在嬰兒哺餵母乳的期間					
15	偶而喝酒(每週一次)的母親不該哺餵母乳					
16	餵食配方奶較可靠，因為可以準確計算出嬰兒喝到的奶量					
17	目前嬰兒配方奶粉與母乳具有同等的營養價值					
18	婦女不應該在公共場所(例如餐廳)哺餵母乳					



接著，是母乳哺餵的相關知識題，請同學勾選「正確」或「不正確」欄位。若您不確定答案為何，可以勾選第三個「不知道」欄位。

		正 確	不 正 確	不 知 道
19	在炎熱的天氣，哺餵母奶的嬰兒需要補充額外的水分			
20	哺餵母奶的嬰兒預計在出生兩週時其體重會恢復至出生體重			
21	哺餵母奶的婦女一旦懷孕應該要建議其斷奶			
22	哺餵母奶充分的兩週大嬰兒每三天排便一次是正常的			
23	哺餵母奶的婦女有較低的乳癌發生率			
24	產後三個月內可以選擇 Amoxycillin (青黴素類抗生素)來治療乳腺炎			
25	C 型肝炎的婦女應禁止哺餵母奶			
26	乳頭破裂的婦女應該將乳汁擠出並且讓乳頭休息 24 小時			
27	增加液體的攝取將會增加乳汁量			
28	高濃度的泌乳素是泌乳開始的要素			
29	補充餵食水分或配方奶，會干擾母乳哺餵的建立			
30	產前的乳頭準備可以預防產後一周內的乳頭疼痛			
31	假如嬰兒含乳時有任何問題，可以使用乳頭保護罩			
32	在哺餵母奶的過程中，母奶的營養成分會改變			
33	餵食配方奶的嬰兒會比哺餵母奶的嬰兒較易發生耳部感染			
34	乳頭破裂最常見的原因是餵奶姿勢不良及嬰兒含乳方式不當			
35	如果母親在哺餵母奶期間有服用處方藥物，在大部分的情況下必須暫時停餵母奶			
36	哺餵母奶的嬰兒其生長情形與餵食配方奶的嬰兒不同			
37	每次哺餵母奶後追加瓶餵，是處理嬰兒體重增加不足的最好方法			
38	母奶過多的婦女，可以選擇每次只哺餵一側的乳房			

最後，我想知道同學您的一些個人基本資料

39. 班級:四護 \_\_\_\_\_ 座號: \_\_\_\_\_

40. 性別:  男  女

41. 出生國家:  台灣  其他 (請描述): \_\_\_\_\_

42. 婚姻狀況:  未婚  已婚  其他 (請描述): \_\_\_\_\_

43. 您的母親有對您哺餵母乳嗎?  有  沒有  不清楚

44. 您過去有與母乳哺餵相關的經驗嗎，例如發生在您的兄弟姊妹或任何家庭成員身上?

有 (如果有，請描述: \_\_\_\_\_)  沒有

45. 您有看過婦女在公共場所(例如購物商場或餐廳)哺餵母乳嗎?  有  沒有

46. 就您的想法，台灣婦女在以下兩個時間點，主要建立及維持母乳哺餵的困境或障礙為何?

產後最初六週: \_\_\_\_\_ ; 返回工作職場時: \_\_\_\_\_

47. 請問您對於產科實驗技術課「母乳哺餵」單元，自己學習的滿意程度如何?

非常不滿意 非常滿意

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0	1	2	3	4	5	6	7	8	9	10	

48. 請問您對於產科護理學「母乳哺餵」單元，自己學習的滿意程度如何?

非常不滿意 非常滿意

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0	1	2	3	4	5	6	7	8	9	10

49. 請問對於您在有效地支持母親進行母乳哺餵的能力上，目前您的自信程度如何?

完全沒自信 非常有自信

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0	1	2	3	4	5	6	7	8	9	10

問卷到此結束 最後請檢查是否有漏填的地方 再次感謝您對本研究的協助



## Appendix 3: Demographic Sheets and Interview Questions

### Demographic Characteristics - Mothers

1. **What is your baby's birthday?** Month\_\_\_\_\_ Day\_\_\_\_\_
2. **How many weeks of your gestational age at birth?**  
1  Under 37 2  37-40 3  Over 40
3. **Type of birth:** 1  Normal spontaneous delivery 0  Caesarean section
4. **Do you have twins or more than one baby?** 1  Yes (how many: \_\_\_\_\_) 0  No
5. **Your age group:** 1  under 18 2  18-25 3  26-30 4  31-34 5  35-40  
6  41 and above
6. **Country of birth:** 1  Taiwan 2  Vietnam 3  Other (describe): \_\_\_\_\_
7. **Marital status:** 1  Never married 2  Married 3  Other (describe): \_\_\_\_\_
8. **What is your highest level of education?** 1  Junior High School  
2  Senior High School 3  Associate Degree (5 years) 4  Bachelor's Degree  
5  Master's Degree 6  Doctorate
9. **What is your employment status?**  
1  Employed for full-time wages 2  Employed for part-time wages  
3  Unemployed 4  Self-employed 5  Student 6  Military 7  Homemaker  
8  Other (describe): \_\_\_\_\_
10. **Do any family members live with you?** 1  Yes (if yes, how many: \_\_\_\_\_) 0  No
11. **How long do you plan to breastfeed?**  
1  Less than 2 weeks 2  2 – 8 weeks 3  9 – 12 weeks 4  13 weeks– 6 months  
5  6 months – 1 year 6  More than 1 year
12. **Do you have any family members who will help you to care for your baby when you return home?** 1  Yes (please specify: \_\_\_\_\_) 0  No
13. **When are you returning to work?** 1  Less than 8 weeks 2  8 weeks  
3  3 months 4  6 months 5  Other(describe): \_\_\_\_\_
14. **Do you have any family members who will help you to care baby when you go back to work?** 1  Yes (please specify whom: \_\_\_\_\_) 0  No

## Focus group interview questions - Mothers

### Questions:

1. Please describe for me your experience of breastfeeding.
2. Describe the support you received for breastfeeding when you were in hospital.
  - a. (prompts) Who provided this support and care? Was any of this care provided by a nursing student?
3. Describe the support you are receiving for breastfeeding here at the parent centre.
  - a. (prompts) Who provided this support and care? Was any of this care provided by a nursing student?
4. What are your expectations of nursing students assisting you to start and continue to breastfeed?
  - a. (prompts) What type of supervision did the nursing students in the postnatal ward have? That is, was there a registered nurse or clinical instructor present?
5. What in your view are the most important things that a nursing student needs to know about breastfeeding?
6. How long do you plan to breastfeed your baby?
  - a. (prompts) will you be returning to work, When will that be?
7. What is your plan for breastfeeding after you return to work?
8. What information or support would help you to continue breastfeeding once you return to work?
9. Is there anything else you would like to add about your experience of learning to breastfeed?

## Demographic Characteristics - Nursing Staff

1. **Age group:**  20-30  31-40  41-50  51-60  61 and above
2. **Country of birth:**  Taiwan  Other (describe): \_\_\_\_\_
3. **Marital status:**  Never married  Married  Other (describe): \_\_\_\_\_
4. **How long have you been working as a nurse?** \_\_\_\_\_ Year(s)
5. **How many years have your experience in maternal child health nursing?** \_\_\_\_\_ Year(s)
6. **What position do you hold?**  Head Nurse  Clinical Nurse Specialist  
 Registered Nurse in the hospital  Registered Nurse in the community  
 Other (describe): \_\_\_\_\_
7. **What qualifications do you have? (multiple selections accepted)**  
 Associate Nursing Degree  BSN  MSN  PhD in nursing  
 Midwifery degree  IBCLC
8. **Do you have children of your own?**  Yes  No (if no, please go to question 12)
9. **How many children do you have?** \_\_\_\_\_
10. **Were any of your children breastfed?**  Yes  No (if no, please go to question 12)
11. **What is the total length of your personal breastfeeding experience?**  
 Less than 2 weeks  2 – 8 weeks  9 – 12 weeks  13 weeks– 6 months  
 More than 6 months
12. **In the past 3 months how many women have you cared for with a problem related to breastfeeding? (please mark the most appropriate response)**  
 No patients  1-5  6-10  11-15  16-20  20 and above

## Focus group and Interview questions - Nursing Staff

### Questions:

1. In your view, what do you consider to be the role of nursing students in supporting a mother with breastfeeding?
2. Please describe the knowledge, skills and attitude needed by a nursing student to support breastfeeding women?
3. In your experience, how well prepared are the nursing students to perform this role?
  - a. (prompts) That is what is the level of knowledge and skills of nursing students when they come to clinical practice.
4. What strategies do you use to teach nursing students about breastfeeding in the clinical area?
5. Can you tell me about the communication/interactions that you have with the clinical nursing teachers? Such as, do you have meetings to discuss students' progress?
6. What is currently working well in relation to the education of nursing students in relation to breastfeeding?
7. What improvements or changes would you recommend in relation to training of students either at the university or in clinical practice?

## Demographic Characteristics - Nursing Teacher

1. **Age group:**  1 25-40  2 41-50  3 51-60  4 61 and above
2. **Country of birth:**  1 Taiwan  0 Other (describe): \_\_\_\_\_
3. **Marital status:**  1 Never married  2 Married  3 Other (describe): \_\_\_\_\_
4. **How long have you been working as a nursing educator?** \_\_\_\_\_ Year(s)
5. **How many years have you taught at Chung Hwa University of Medical Technology (CUMT)?** \_\_\_\_\_ Year(s)
6. **What position do you hold?**  1 Professor  2 Associate Professor  3 Assistant Professor  4 Lecturer  5 Clinical practice teacher  6 Teaching assistant
7. **What qualifications do you have? (multiple selections accepted)**  
 1 BSN  2 MSN  3 PhD in nursing  4 Midwifery degree  5 IBCLC
8. **How many years have your practical or clinical experience as a nurse?** \_\_\_\_\_ Year(s)
9. **How many years have your experience in maternal child health nursing?** \_\_\_\_\_ Year(s)
10. **Do you have children of your own?**  1 Yes  0 No (if no, end of the survey)
11. **How many children do you have?** \_\_\_\_\_
12. **Were any of your children breastfed?**  1 Yes  0 No (if no, end of the survey)
13. **What is the total length of your personal breastfeeding experience?**  
 1 Less than 2 weeks  2 2 – 8 weeks  3 9 – 12 weeks  4 13 weeks– 6 months  
 5 More than 6 months



## Focus group meeting questions - Nursing Teacher

### Questions:

1. Tell me in general about your experience of teaching the maternal child nursing course.
  - a. (prompts) How long have you been teaching students in this course? What are the things that you like about teaching this course? What are some of the challenges?
2. More specifically, please tell me about your experience of teaching nursing students about breastfeeding knowledge and skills in the classroom/clinical laboratory.
3. In the curriculum, you have four hours to teach about breastfeeding, what do you believe is the most important theoretical content to teach in this time?
4. In the curriculum, you have six hours to teach about the practical skills of supporting women with breastfeeding, what do you believe is the most important skills to teach in this time?
5. Do you find that you have sufficient time to teach this content and skills and if not sufficient time, what additional knowledge or skills do the students need?
  - a. (prompts) Is there any content missing from the course about breastfeeding?
6. What teaching strategies do you use to teach this part of the course?
  - a. (prompts) For example, do you use audio-visual tools such as PowerPoint; DVDs, lecture style.
7. In your view, what do you think new mothers expect from student nurses supporting them with breastfeeding?
  - a. Some women in Taiwan cease breastfeeding at eight weeks when they return to work, what do you think is the nurses' role in encouraging women to breastfeed for longer?
8. How do you communicate with clinical nursing staff to assist nursing students to develop competency to support breastfeeding? How could this communication be improved?
9. If you had a magic wand and could change any or all aspects of the course related to breastfeeding and postnatal care, what would you change? What would the ideal course about breastfeeding look like?

## Appendix 4: Permission letter for Data Collection in Taiwan

Re: Permission to collect data at Department of Nursing  
at Chung Hwa University of Medical Technology

黃惠子 <luck@mail.hwai.edu.tw>

週二 2016/3/15 下午 11:12

收件者:Shu-Fei Yang <18234187@student.uws.edu.au>;

Dear Shu-Fei,

Department of Nursing at Chung Hwa University of Medical Technology permits  
of Shu-Fei Yang, doctoral student at Western Sydney University, doing data  
collection for doctoral dissertation.

Hui-Tzu Huang, PhD, RN,  
Associate Professor,  
Director, Department of Nursing,  
Chung Hwa University of Medical Technology  
Email: luck@mail.hwai.edu.tw  
TEL : 06-2674567; 2671214 ext. 500  
Fax : 06-2605792

On Tue, 15 Mar 2016 11:34:41 +0000, Shu-Fei Yang wrote

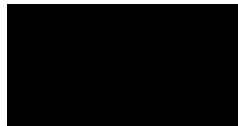
>  
>  
>  
> Dear Director,  
>  
> My name is Shu-Fei Yang, I'm a research student at Western Sydney University in Australia. I am currently working on  
my thesis about breastfeeding knowledge and attitudes of nursing students in Taiwan.  
> I'm wondering if I would be able to collect data with your permission at Department of Nursing at Chung Hwa  
University of Medical Technology.  
> Thank you very much  
>  
> Best regards, Shu-Fei Yang MSN, BSN, PhD Candidate

April 25, 2016

The purpose of this letter is to grant Shu-Fei Yang, a doctoral student at the School of Nursing and Midwifery, Western Sydney University in Australia permission to conduct research at Jin-Sin Women and Children's Hospital and Santino postpartum nursing home.

I have reviewed the research information sheet and understand what the study titled "Breastfeeding knowledge and attitudes of baccalaureate nursing students in Taiwan" entails.

If I have any further questions about this research study I understand the principle researcher, Shu-Fei Yang can be researched at (+886) 0910820861 (Taiwan) or (+61) 0490356097 (Sydney), or via email at 18234187@student.westernsydney.edu.au. I also understand that if I have any complaints or reservations about the ethical conduct of this research, I can contact the Ethics Committee through the Research, Engagement, Development and Innovation office on Tel (+61) 2 4736 0229, Fax (+61) 2 4736 0905 (Sydney) or email humanethics@westernsydney.edu.au.



Mei-Hui Chen

Supervisor, Department of Nursing  
Jin-Sin Women and Children's Hospital  
TEL: 06-2019188 ext.213



# Appendix 5: Participant Information Sheet and Consent Form

School of Nursing and Midwifery  
Western Sydney University  
Locked Bag 1797  
Penrith NSW 2751  
Australia



## Participant Information Sheet (Mother)

**Project Title:** Breastfeeding knowledge and attitudes of baccalaureate nursing students in Taiwan.

**Project Summary:** This study aims to 1/ examine Taiwanese nursing students' knowledge, attitudes and confidence towards breastfeeding and their experience of providing breastfeeding support before and after participation in their theoretical and clinical education program and, 2/ describe perceptions of university teaching staff, clinical nurses and new mothers towards the role of nursing students in supporting breastfeeding.

It is hoped that findings from this study will contribute to informing curriculum redesign, in particular educational program on breastfeeding for nursing students that increases knowledge and confidence to support breastfeeding women.

You are invited to participate in this study being conducted by Ms Shu-Fei Yang, a doctoral student from the School of Nursing and Midwifery, Western Sydney University under the supervision of Professor Virginia Schmieid, Associate Professor Yenna Salamonson, and Dr Elaine Burns, from the School of Nursing and Midwifery, Western Sydney University, Sydney Australia.

### How is the study being paid for?

The researcher is a full-time doctoral student. Otherwise, this is an unfunded study.

### What will I be asked to do?

If you agree to participate in this study, you will be asked to participate in a focus group with other new mothers to share your perceptions and experiences of the breastfeeding support you have received from nursing staff in the hospital and in the postpartum nursing home and to discuss your perceptions of the role of registered nurse and nursing students in supporting breastfeeding.

### How much of my time will I need to give?

The focus group meeting will be held at a time and place convenient to you and last from 60 to 90 minutes.

### What benefits will I, and / or the broader community, receive for participating?

There may not be any specific benefits for you in this study. However, you may enjoy the opportunity to talk about your experiences of breastfeeding support from the nursing staff and students.

### Will the study involve any discomfort or risk for me? If so, what will you do to rectify it?

The study is not likely to involve any discomfort to you. If you did become distressed during or after the focus group you may talk with the registered nurses on the postpartum nursing home and they will be able to arrange for counselling or other appropriate support. Any counselling or support will be provided by qualified staff who are not members of the research project team, or you may contact on the following number: (+886) 0800-870-870 consultation line for maternal care, Health Promotion Administration, Ministry of Health and Welfare, Taiwan.

### How do you intend to publish the results?

The results of the study will be disseminated through presentations at conferences and seminars in Taiwan, in Australia and perhaps at other locations. The researchers will also publish the findings in peer reviewed journals. The study does not include your identifiable information such as names.

### Can I withdraw from the study?

Participation is entirely voluntary and you are not obliged to be involved. If you do participate, you can withdraw at any time without giving a reason. Whatever your decision, it will not affect your relationship with the medical and nursing staff at postpartum nursing home.

**Can I tell other people about the study?**

Yes, you can tell other people about the study by providing them with the chief investigator's contact details. They can contact the chief investigator to discuss their participation in the research project and obtain an information sheet.

**What if I require further information?**

If you would like to know more about the study, please feel free to contact Ms. Shu-Fei Yang, a PhD research candidate in the School of Nursing and Midwifery, Western Sydney University, on email [18234187@student.uws.edu.au](mailto:18234187@student.uws.edu.au), or Tel (+61) 0490356097 (Sydney) or contact Shu-Fei's supervisor, Professor Virginia Schmied at [v.schmied@westernsydney.edu.au](mailto:v.schmied@westernsydney.edu.au), or Tel (+61) 0296859505 (Sydney).

**What if I have a complaint?**

This study has been approved by the Western Sydney University Human Research Ethics Committee. The Approval number is H11611.

If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Research, Engagement, Development and Innovation office on Tel +61 2 4736 0229 Fax +61 2 4736 0905 or email [humanethics@westernsydney.edu.au](mailto:humanethics@westernsydney.edu.au).

Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome. If you agree to participate in this study, you may be asked to sign the Participant Consent Form.

The information sheet is for the participant to keep and the consent form is retained by the researcher.

## Participant Information Sheet (Nursing staff)

**Project Title:** Breastfeeding knowledge and attitudes of baccalaureate nursing students in Taiwan.

**Project Summary:** This study aims to 1/ examine Taiwanese nursing students' knowledge, attitudes and confidence towards breastfeeding and their experience of providing breastfeeding support before and after participation in their theoretical and clinical education program and, 2/ describe perceptions of university teaching staff, clinical nurses and new mothers towards the role of nursing students in supporting breastfeeding.

It is hoped that findings from this study will contribute to informing curriculum redesign, in particular educational program on breastfeeding for nursing students that increases knowledge and confidence to support breastfeeding women.

You are invited to participate in study being conducted by Ms Shu-Fei Yang, a doctoral student from the School of Nursing and Midwifery, Western Sydney University under the supervision of Professor Virginia Schmie, Associate Professor Yenna Salamonson, and Dr Elaine Burns, from the School of Nursing and Midwifery, Western Sydney University, Sydney Australia.

### How is the study being paid for?

The researcher is a full-time doctoral student. Otherwise, this is an unfunded study.

### What will I be asked to do?

If you agree to participate in this study, you will be asked to participate in a focus group with other nursing staff or face-to-face interview to share your thoughts on the role of nursing students in supporting breastfeeding women and your experiences of working with nursing students in the postpartum unit particularly in relation to breastfeeding. You will also be asked to and discuss and reflect upon your perceptions in relation to the role of nursing students in supporting breastfeeding. Your views on the current theoretical and clinical education that nursing students receive in relation to breastfeeding.

### How much of my time will I need to give?

The face-to-face interview or focus group meeting will be held at a time and place convenient to you, most likely a private room in the hospital. Duration of interview or meeting will last from 60 to 90 minutes.

### What benefits will I, and / or the broader community, receive for participating?

There may not be any specific benefits for you in this study. However, the findings of this study will inform improvements in the theoretical and clinical education program for nursing students and this will then benefit the mothers who receive care from nursing students and from graduate nurses.

### Will the study involve any discomfort or risk for me? If so, what will you do to rectify it?

The study is not likely to involve any discomfort to you. If you did become distressed during or after the focus group or face-to-face interview you will be offered referral to counselling services at hospital or you may contact the following number: (+886) 02-25502283 consultation line for registered nurses, Taiwan Union of Nurses Association.

### How do you intend to publish the results?

The results of the study will be disseminated through presentations at conferences and seminars in Taiwan, in Australia and perhaps at other locations. The researchers will also publish the findings in peer reviewed journals. The study does not include your identifiable information such as names.

**Can I withdraw from the study?**

Participation is entirely voluntary and you are not obliged to be involved. If you do participate, you can withdraw at any time without giving a reason.

**Can I tell other people about the study?**

Yes, you can tell other people about the study by providing them with the chief investigator's contact details. They can contact the chief investigator to discuss their participation in the research project and obtain an information sheet.

**What if I require further information?**

If you would like to know more about the study, please feel free to contact Ms. Shu-Fei Yang, a PhD research candidate in the School of Nursing and Midwifery, Western Sydney University, on email [18234187@student.uws.edu.au](mailto:18234187@student.uws.edu.au), or Tel (+61) 0490356097 (Sydney) or contact Shu-Fei's supervisor, Professor Virginia Schmied at [v.schmied@westernsydney.edu.au](mailto:v.schmied@westernsydney.edu.au), or Tel (+61) 0296859505 (Sydney).

**What if I have a complaint?**

This study has been approved by the Western Sydney University Human Research Ethics Committee. The Approval number is H11611.

If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Research, Engagement, Development and Innovation office on Tel +61 2 4736 0229 Fax +61 2 4736 0905 or email [humanethics@westernsydney.edu.au](mailto:humanethics@westernsydney.edu.au).

Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome. If you agree to participate in this study, you may be asked to sign the Participant Consent Form.

The information sheet is for the participant to keep and the consent form is retained by the researcher.



## **Participant Information Sheet (Nursing teacher)**

**Project Title:** Breastfeeding knowledge and attitudes of baccalaureate nursing students in Taiwan.

**Project Summary:** This study aims to 1/ examine Taiwanese nursing students' knowledge, attitudes and confidence towards breastfeeding and their experience of providing breastfeeding support before and after participation in their theoretical and clinical education program and, 2/ describe perceptions of university teaching staff, clinical nurses and new mothers towards the role of nursing students in supporting breastfeeding.

It is hoped that findings from this study will contribute to informing curriculum redesign, in particular educational program on breastfeeding for nursing students that increases knowledge and confidence to support breastfeeding women.

You are invited to participate in study being conducted by Ms Shu-Fei Yang, a doctoral student from the School of Nursing and Midwifery, Western Sydney University under the supervision of Professor Virginia Schmieid, Associate Professor Yenna Salamonson, and Dr Elaine Burns, from the School of Nursing and Midwifery, Western Sydney University, Sydney Australia.

### **How is the study being paid for?**

The researcher is a full-time doctoral student. Otherwise, this is an unfunded study.

### **What will I be asked to do?**

If you agree to participate in this study, you will be asked to participate in a focus group with other colleague to share your thoughts on the role of nursing students in supporting breastfeeding women and your experiences of teaching nursing students at the university particularly in relation to breastfeeding. You will also be asked to discuss your views on the current theoretical and clinical education that nursing students receive in relation to breastfeeding and to consider any changes you wish to make to the breastfeeding education program in the curriculum.

### **How much of my time will I need to give?**

The focus group meeting will be held at a time and in the consultative room of Department of Nursing at the university and last from 60 to 90 minutes.

### **What benefits will I, and / or the broader community, receive for participating?**

There may not be any specific benefits for you in this study. However, the findings of this study will inform improvements in the theoretical and clinical education program for nursing students and this will then benefit the mothers who receive care from nursing students and from graduate nurses.

### **Will the study involve any discomfort or risk for me? If so, what will you do to rectify it?**

The study is not likely to involve any discomfort to you. If you did become distressed during or after the focus group you may contact on the following number: (+886) 06-2674567 ext.501 (Taiwan) Director of Nursing Department, Chung Hwa University of Medical Technology, Taiwan.

### **How do you intend to publish the results?**

The results of the study will be disseminated through presentations at conferences and seminars in Taiwan, in Australia and perhaps at other locations. The researchers will also publish the findings in peer reviewed journals. The study does not include your identifiable information such as names.

**Can I withdraw from the study?**

Participation is entirely voluntary and you are not obliged to be involved. If you do participate, you can withdraw at any time without giving a reason. Whatever your decision, it will not affect your relationship with the principal researcher and other university colleague.

**Can I tell other people about the study?**

Yes, you can tell other people about the study by providing them with the chief investigator's contact details. They can contact the chief investigator to discuss their participation in the research project and obtain an information sheet.

**What if I require further information?**

If you would like to know more about the study, please feel free to contact Ms. Shu-Fei Yang, a PhD research candidate in the School of Nursing and Midwifery, Western Sydney University, on email [18234187@student.uws.edu.au](mailto:18234187@student.uws.edu.au), or Tel (+61) 0490356097 (Sydney) or contact Shu-Fei's supervisor, Professor Virginia Schmied at [v.schmied@westernsydney.edu.au](mailto:v.schmied@westernsydney.edu.au), or Tel (+61) 0296859505 (Sydney).

**What if I have a complaint?**

This study has been approved by the Western Sydney University Human Research Ethics Committee. The Approval number is H11611.

If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Research, Engagement, Development and Innovation office on Tel +61 2 4736 0229 Fax +61 2 4736 0905 or email [humanethics@westernsydney.edu.au](mailto:humanethics@westernsydney.edu.au).

Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome. If you agree to participate in this study, you may be asked to sign the Participant Consent Form.

The information sheet is for the participant to keep and the consent form is retained by the researcher.

## **Participant Information Sheet (Nursing student-focus group)**

**Project Title:** Breastfeeding knowledge and attitudes of baccalaureate nursing students in Taiwan.

**Project Summary:** This study aims to 1/ examine Taiwanese nursing students' knowledge, attitudes and confidence towards breastfeeding and their experience of providing breastfeeding support before and after participation in their theoretical and clinical education program and, 2/ describe perceptions of university teaching staff, clinical nurses and new mothers towards the role of nursing students in supporting breastfeeding.

It is hoped that findings from this study will contribute to informing curriculum redesign, in particular educational program on breastfeeding for nursing students that increases knowledge and confidence to support breastfeeding women.

You are invited to participate in study being conducted by Ms Shu-Fei Yang, a doctoral student from the School of Nursing and Midwifery, Western Sydney University under the supervision of Professor Virginia Schmied, Associate Professor Yenna Salamonson, and Dr Elaine Burns, from the School of Nursing and Midwifery, Western Sydney University, Sydney Australia.

### **How is the study being paid for?**

The researcher is a full-time doctoral student. Otherwise, this is an unfunded study.

### **What will I be asked to do?**

If you agree to participate in this study, you will be asked to participate in a focus group with other nursing students to share experiences and discuss and reflect upon your role in supporting breastfeeding.

### **How much of my time will I need to give?**

The focus group meeting will be held at a time and in the consultative room of Department of Nursing at the university and last from 60 to 90 minutes.

### **What benefits will I, and / or the broader community, receive for participating?**

You are unlikely to gain any specific benefit from participating in the study. However, your contribution will help inform nursing curriculum development to better equip nurses in supporting women with breastfeeding.

### **Will the study involve any discomfort or risk for me? If so, what will you do to rectify it?**

The study is not likely to involve any discomfort to you. If you did become distressed during or after the focus group you may talk with your student welfare tutor or you may contact on the following number: (+886) 06-28953777 (Taiwan) consultation line for students, Chung Hwa University of Medical Technology, Taiwan.

### **How do you intend to publish the results?**

The results of the study will be disseminated through presentations at conferences and seminars in Taiwan, in Australia and perhaps at other locations. The researchers will also publish the findings in peer reviewed journals. The study does not include participants' identifiable information such as names.

### **Can I withdraw from the study?**

Participation is entirely voluntary and you are not obliged to be involved. If you do participate, you can withdraw at any time without giving a reason. Whatever your decision, it will not affect your academic performance or evaluation at Chung Hwa University of Medical Technology.

**Can I tell other people about the study?**

Yes, you can tell other people about the study by providing them with the chief investigator's contact details. They can contact the chief investigator to discuss their participation in the research project and obtain an information sheet.

**What if I require further information?**

If you would like to know more about the study, please feel free to contact Ms. Shu-Fei Yang, a PhD research candidate in the School of Nursing and Midwifery, Western Sydney University, on email [18234187@student.uws.edu.au](mailto:18234187@student.uws.edu.au), or Tel (+61) 0490356097 (Sydney) or contact Shu-Fei's supervisor, Professor Virginia Schmied at [v.schmied@westernsydney.edu.au](mailto:v.schmied@westernsydney.edu.au), or Tel (+61) 0296859505 (Sydney).

**What if I have a complaint?**

This study has been approved by the Western Sydney University Human Research Ethics Committee. The Approval number is H11611.

If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Research, Engagement, Development and Innovation office on Tel +61 2 4736 0229 Fax +61 2 4736 0905 or email [humanethics@westernsydney.edu.au](mailto:humanethics@westernsydney.edu.au).

Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome. If you agree to participate in this study, you may be asked to sign the Participant Consent Form.

The information sheet is for the participant to keep and the consent form is retained by the researcher.



## Participant Information Sheet (Nursing student-survey)

**Project Title:** Breastfeeding knowledge and attitudes of baccalaureate nursing students in Taiwan.

**Project Summary:** This study aims to 1/ examine Taiwanese nursing students' knowledge, attitudes and confidence towards breastfeeding and their experience of providing breastfeeding support before and after participation in their theoretical and clinical education program and, 2/ describe perceptions of university teaching staff, clinical nurses and new mothers towards the role of nursing students in supporting breastfeeding.

It is hoped that findings from this study will contribute to informing curriculum redesign, in particular educational program on breastfeeding for nursing students that increases knowledge and confidence to support breastfeeding women.

You are invited to participate in study being conducted by Ms Shu-Fei Yang, a doctoral student from the School of Nursing and Midwifery, Western Sydney University under the supervision of Professor Virginia Schmied, Associate Professor Yenna Salamonson, and Dr Elaine Burns, from the School of Nursing and Midwifery, Western Sydney University, Sydney Australia.

### **How is the study being paid for?**

The researcher is a full-time doctoral student. Otherwise, this is an unfunded study.

### **What will I be asked to do?**

You will be asked to complete a questionnaire about your knowledge of and attitudes towards breastfeeding.

### **How much of my time will I need to give?**

The study involves participants filling out a questionnaire assessing knowledge and attitude related to support women to breastfeed. Completing the questionnaire will take approximately 15 minutes.

### **What benefits will I, and / or the broader community, receive for participating?**

There may not be any specific benefits for you in this study. However, your contribution will help inform nursing curriculum development to better equip nurses in supporting women with breastfeeding.

### **Will the study involve any discomfort or risk for me? If so, what will you do to rectify it?**

The study is not likely to involve any discomfort to you. If you did become distressed during or after the survey you may talk with your student welfare tutor or you may contact on the following number: (+886) 06-2895377 (Taiwan) consultation line for students, Chung Hwa University of Medical Technology, Taiwan.

### **How do you intend to publish the results?**

The results of the study will be disseminated through presentations at conferences and seminars in Taiwan, in Australia and perhaps at other locations. The researchers will also publish the findings in peer reviewed journals. The study does not include participants' identifiable information such as names.

### **Can I withdraw from the study?**

Participation is entirely voluntary and you are not obliged to be involved. If you do participate, you can withdraw at any time without giving a reason. Whatever your decision, it will not affect your academic performance or evaluation at Chung Hwa University of Medical Technology.

### **Can I tell other people about the study?**

Yes, you can tell other people about the study by providing them with the chief investigator's contact

details. They can contact the chief investigator to discuss their participation in the research project and obtain an information sheet.

**What if I require further information?**

If you would like to know more about the study, please feel free to contact Ms. Shu-Fei Yang, a PhD research candidate in the School of Nursing and Midwifery, Western Sydney University, on email [18234187@student.uws.edu.au](mailto:18234187@student.uws.edu.au), or Tel (+61) 0490356097 (Sydney) or contact Shu-Fei's supervisor, Professor Virginia Schmied at [v.schmied@westernsydney.edu.au](mailto:v.schmied@westernsydney.edu.au), or Tel (+61) 0296859505 (Sydney).

**What if I have a complaint?**

This study has been approved by the Western Sydney University Human Research Ethics Committee. The Approval number is H11611.

If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Research, Engagement, Development and Innovation office on Tel +61 2 4736 0229 Fax +61 2 4736 0905 or email [humanethics@westernsydney.edu.au](mailto:humanethics@westernsydney.edu.au).

Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome. If you agree to participate in this study, you may be asked to sign the Participant Consent Form.

The information sheet is for the participant to keep and the completion of this survey implies your consent to participate.



## Participant Consent Form

This is a project specific consent form. It restricts the use of the data collected to the named project by the named investigators.

Project Title: Breastfeeding knowledge and attitudes of baccalaureate nursing students in Taiwan.

I, \_\_\_\_\_ consent to participate in the research project titled: Breastfeeding knowledge and attitudes of baccalaureate nursing students in Taiwan.

I acknowledge that:

I have read the participant information sheet and have been given the opportunity to discuss the information and my involvement in the project with the researcher.

The procedures required for the project and the time involved have been explained to me, and any questions I have about the project have been answered to my satisfaction.

I consent to the transcription of recorded the meeting discussions and the use of any materials I have written as a participant in the study, being used for educational or research purposes.

I understand that my involvement is confidential and that the information gained during the study may be published but no information about me will be used in any way that reveals my identity.

I understand that I can withdraw from the study at any time, without affecting my relationship with the researcher now or in the future.

Signed:

Name:

Date:

Return Address: Department of Nursing, Chung Hwa University of Medical Technology

No.89, Wenhwa 1st St., Rende Shiang District, Tainan City 717, Taiwan

This study has been approved by the Western Sydney University Human Research Ethics Committee. The Approval number is: H11611

If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Office of Research Services on Tel +61 2 4736 0229 Fax +61 2 4736 0905 or email [humanethics@westernsydney.edu.au](mailto:humanethics@westernsydney.edu.au). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

# Participant Information Sheet and Consent Form (Chinese)

School of Nursing and Midwifery  
Western Sydney University  
Locked Bag 1797  
Penrith NSW 2751  
Australia



## 參與研究說明書

### 計畫名稱：台灣護生母乳哺餵知識及態度之探討

本研究為澳洲西雪梨大學(WSU)護理及助產學院(School of Nursing and Midwifery)的博士論文研究計畫案，由研究生楊淑斐(Shu-Fei Yang)提出計畫，並由 Virginia Schmied 教授，Yenna Salamonson 教授以及 Elaine Burns 博士指導執行。

**計畫摘要：**本研究目的有二

- 1.台灣護理學生在接受學校理論和臨床教育課程前後，調查學生關於母乳哺餵的知識、態度和自信，以及提供母乳哺餵支持的相關經驗。
- 2.描述學校教師，臨床護理人員和新手媽媽對於護生在支持母乳哺餵角色的看法。

本研究的結果希望能有助於學校課程的重新設計，特別是針對母乳哺餵的教育課程改善，提升護生其母乳哺餵的知識和信心，進而讓哺餵母乳的媽媽及孩子受益。

您將會被邀請與其他同事共同參加團體討論會議，分享對於護生在支持母乳哺餵角色的看法，以及您在這方面的教學方法與經驗分享、討論及反思您的教學實務，並針對母乳哺餵在目前學校課室教學(理論課、實驗課)及臨床產科實習教育提供建議。

您在團體討論會議中的文稿、錄音以及所有書面的資料，將依其教育或研究的目的，提供研究生楊淑斐作為研究使用。您的參與及口頭上所提供的資料將受到嚴格保密，若此研究可能進行的學術文獻發表，將不會出現任何可資辨認研究參與者之資訊。研究過程將不會對您造成生理或安全上的傷害，您對本研究的自願參與或中途終止參與的權利絕對受到尊重。

若您對本研究有任何的疑慮或考量，可以跟研究生楊淑斐以手機:0910820861聯絡，或澳洲西雪梨大學研究發展辦公室與倫理委員會連絡，e辦公室電話:(+61) 02 4736 0229 或電子郵件: [humanethics@westernsydney.edu.au](mailto:humanethics@westernsydney.edu.au)。

感謝您的合作與參與!

澳洲西雪梨大學護理博士候選人

楊淑斐 敬上



## 參與研究說明書

### 計畫名稱：台灣護生母乳哺餵知識及態度之探討

本研究為澳洲西雪梨大學(WSU)護理及助產學院(School of Nursing and Midwifery)的博士論文研究計畫案，由研究生楊淑斐(Shu-Fei Yang)提出計畫，並由 Virginia Schmied 教授，Yenna Salamonson 教授以及 Elaine Burns 博士指導執行。

**計畫摘要：**本研究目的有二

- 1.台灣護理學生在接受學校理論和臨床教育課程前後，調查學生關於母乳哺餵的知識、態度和自信，以及提供母乳哺餵支持的相關經驗。
- 2.描述學校教師，臨床護理人員和新手媽媽對於護生在支持母乳哺餵角色的看法。

本研究的結果希望能有助於學校課程的重新設計，特別是針對母乳哺餵的教育課程改善，提升護生其母乳哺餵的知識和信心，進而讓哺餵母乳的媽媽及孩子受益。

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感謝您的合作與參與!

澳洲西雪梨大學護理博士候選人

楊淑斐 敬上

## 參與研究說明書

各位同學您好:

邀請您參加本研究，計畫名稱為台灣護生母乳哺餵知識及態度之探討。此為澳洲西雪梨大學(WSU)護理及助產學院(School of Nursing and Midwifery)的博士論文研究計畫案，由研究生楊淑斐(Shu-Fei Yang)提出計畫，主要指導者為Virginia Schmieid教授。

本研究目的主要為調查護生在接受學校理論和臨床教育課程前後，其關於母乳哺餵的知識、態度和信心，以及提供母乳哺餵支持的相關經驗。本研究的結果希望能有助於學校課程的重新設計，特別是針對母乳哺餵的教育課程改善，提升護生其母乳哺餵的知識和信心，進而讓哺餵母乳的媽媽及孩子受益。

請您針對問卷中每一題的陳述，勾選一個最適切的項目。請勿花太多時間在單一題目上及試圖想像最好的答案。另外，此問卷會採前、後二次測驗，為追蹤結果會請您於個人基本資料的部份，填寫上自己的班級及座號(或學號)，您的填答結果僅供本研究使用並將會受到嚴格保密。本問卷的填答與繳回，即視為您本人對此問卷的填答表示同意。

若您對參與本問卷填答有任何的疑異，隨時歡迎您與我連絡。您如果不願意完成此份問卷，也不會對您在校的課程或學習有任何影響。若您對本研究有任何倫理上的意見或考量，您可以透過澳洲西雪梨大學研究發展辦公室與倫理委員會連絡，辦公室電話:(+61) 02 4736 0229 或 電子郵件: [humanethics@westernsydney.edu.au](mailto:humanethics@westernsydney.edu.au)。

感謝您的合作與參與!

澳洲西雪梨大學護理博士研究生

楊淑斐 敬上

## 參與研究同意書

本人簽名與末端，表示同意並自願參與研究計畫：「台灣護生母乳哺餵知識及態度之探討」。

本人已經閱讀參與研究說明書上所提供的訊息，經由與研究說明者討論後，本人已詳細瞭解此研究。對於本研究計畫的疑問，亦獲得滿意的解釋。

基於對本研究的參與，本人同意會議討論過程中的文稿、錄音以及所有書面的資料，提供給教育或研究的目的所使用。

本人了解我的參與及口頭上所提供的資料將受到嚴格保密，而且此研究可能進行的學術文獻發表，不會出現任何可資辨認研究參與者之資訊。

本人了解我可以在任何時間退出此研究且不會引響我與研究說明者日後的關係。

立同意書人姓名 (Name)： (請正楷書寫)

立同意書人簽名 (Signed)：

同意日期 (Date)：西元 年 月 日 (yy/mm/dd)

本研究已經由澳洲西雪梨大學人類研究倫理審查委員會審查通過，核准編號：H11611。

若您對本研究有任何倫理上的意見或考量，您可以透過澳洲西雪梨大學研究發展辦公室與倫理委員會連絡，辦公室電話：(+61) 02 4736 0229，傳真電話：(+61) 02 4736 0905 或電子郵件：humanethics@westernsydney.edu.au。任何您提出的問題將保密和進行徹查，並且會通知您結果。